INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

# REPORT OF THE NINETEENTH MEETING OF THE APANPIRG ATM/AIS/SAR SUB-GROUP (ATM/AIS/SAR/SG/19)

Bangkok, Thailand, 22 – 26 June 2009

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

Approved by the Meeting
And published by authority of the Secretary General

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## PART I – HISTORY OF THE MEETING

### 1. Introduction

1.1 The Nineteenth meeting of the APANPIRG Air Traffic Management/Aeronautical Information Services/Search and Rescue Sub-Group (ATM/AIS/SAR/SG/19) was held at the Kotaite Wing of the ICAO Asia and Pacific Regional Office, Bangkok, Thailand from 22 to 26 June 2009.

### 2. Attendance

2.1 The meeting was attended by 92 participants from 22 States, 2 Special Administrative Regions of China and 3 International Organizations. A list of participants is provided at **Attachment 1** to this Report.

### 3. Officers and Secretariat

3.1 Mr. Colman Ng, Assistant Director-General, Civil Aviation Department of Hong Kong, China acted as Chairman of the Sub-Group and presided over the meeting throughout its duration.

3.2 Mr. Andrew Tiede, Regional Officer ATM, ICAO Asia/Pacific Office, was Secretary of the meeting. He was assisted by Mr. Kyotaro Harano, Regional Officer ATM and Mr. Roger Mulberge, ICAO Technical Expert.

### 4. Language and Documentation

4.1 The discussions were conducted in English. Documentation was issued in English with a total of 42 Working Papers, 23 Information Papers and 2 Flimsies being considered by the meeting. A list of papers from the meeting is included in **Attachment 2** to this report.

### 5. Opening of the Meeting

ICAO Regional Office

5.1 Mr. Rod Graff, Deputy Regional Director, ICAO Asia and Pacific Regional Office welcomed all delegates to the Asia and Pacific Office and conveyed warmest greetings from the Regional Director. He drew attention to the many successes that were to be presented in Working Papers to the meeting as a result of the work of the ATM, AIS and SAR regional groups.

5.2 The RVSM Task Force had completed its one year review of the implementation of RVSM in China. This had been highly successful and the Task Force, after 34 meetings had completed its mandate and was dissolved. The implementation of RVSM in DPRK was well advanced thanks to assistance from China and the Regional Office. The WPAC/SCS Scrutiny Group had been very successful in implementing new flight level arrangements and driving the TLS estimates onto the correct side of the TLS benchmark and had voted to dissolve itself as its Terms of Reference have been substantially met. The Bay of Bengal ATFM procedures using the BOBCAT system are running on a daily basis, providing sequencing relief to up to 73 flights through the Kabul FIR each night. An ATFM Workshop, meetings of the APAC AIS Task Force and an AIS SIP hosted

in Japan had produced successful outcomes and ICAO HQ has formed an AIS panel to ensure that AIS matters are adequately addressed. At a very successful HK international SAREX in October 2008 the Regional Office took the opportunity to present a short SAR seminar preceding the SAR exercises in Hong Kong waters. SAR related Conclusions from previous APANPIRGs moved forward, thanks to assistance from the United States. The PBN Task Force updated the Regional PBN Plan for review by this meeting. This Sub-Group's involvement in en-route PBN implementation is key in order that we undertake the work needed to achieve the targets set by the regional plan and the ICAO Assembly. The first meeting of the APAC Flight Plan Task Force was held in March and many challenges lie ahead in this area alone.

5.3 Looking forward, the Secretariat has prepared the next steps toward ICAO's Performance based planning process in presenting PFF forms, performance objectives and metrics; and also conducted a review against IATA User requirements for consideration by the Sub-Group. More challenges await this week, with the many Working and Information Papers indicating an interesting time ahead. Finally, the Deputy Director wished the meeting success in moving forward the air navigation planning and implementation in the Region.

Chairman of the Sub-Group

5.4 Mr. Colman Ng welcomed all delegates to the meeting. He recalled that the time of the last Sub-Group Meeting, the aviation industry was busy trying to tackle the pressures of traffic congestion, the airport and airspace capacity crunch caused by increasing traffic demand and the escalating fuel price. For most part of 2008, the industry was struggling to cope with the spiraling fuel cost when it reached a record US$150 per barrel level. The Chairman noted that things have changed drastically since then and although the fuel price has slashed by half we are now facing even bigger challenges. He remarked that it just a few short months for the world economy to transform from boom to gloom and we are now experiencing a period of economic recession unseen in modern times. The industry is plagued by this financial tsunami, and simultaneously by the Human Swine Flu pandemic which has seriously affected air travel in recent weeks.

5.5 In the face of such bleak scenarios, the Chairman offered the old Chinese saying – "When the path is full of hazards, there are also plenty of opportunities". He urged the meeting to focus on identifying and building on the opportunities. The Chairman stated that there should be no let up in our efforts to strive for improvement to operating efficiency and enhancement to capacity and with the meeting's willingness to go an extra step, he considered that much could be achieved in pursuing the safe and harmonious development of civil aviation in the Region. He thanked the Secretariat for the leadership and hard work, and wished delegates a fruitful and rewarding meeting.

## 6. Draft Conclusions, Draft Decisions and Decisions of the ATM/AIS/SAR Sub-Group

6.1 The ATM/AIS/SAR Sub-Group records its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

a) **Draft Conclusions** deal with matters that, according to APANPIRG terms of reference, merit directly the attention of States, or on which further action is required to be initiated by the Secretary according to established procedures.

b) **Draft Decisions** relate to matters dealing with the internal working arrangements but requires the prior agreement of the APANPIRG before it can be implemented or otherwise.

c) **Decisions** of ATS/AIS/SAR Sub-Group relate solely to matters dealing with the internal working arrangements of the ATS/AIS/SAR Sub-Group.

6.2 **List of Decisions of ATM/AIS/SAR/SG/19**

ATM/AIS/SAR Sub-Group Decision 19/1 – Establish Southeast Asia Route Review Task Force (SEA RR/TF)

6.3 **List of Draft Conclusions**

Draft Conclusion SG19/2 – Data Collection for Regional Metrics

Draft Conclusion SG19/3 – APAC Regional Metrics

Draft Conclusion SG19/5 – Adopt Interim Strategy for Implementation of New Flight Plant Format

Draft Conclusion SG19/6 – Notification of State Transition Date to New Flight Plan Format

Draft Conclusion SG19/7 – Assistance to States to Implement eTOD

Draft Conclusion SG19/8 – SAR Guidance on 121.5 MHz Search Planning

Draft Conclusion SG19/9 – Provide SAR 121.5 MHz Guidance to ICAO/IMO JWG

Draft Conclusion SG19/10 – SSR Code Coordination with ORCAM Secretariat

Draft Conclusion SG19/11 – ATFM Compliance-Advice to Airlines and Airports

Draft Conclusion SG19/12 – ATFM Steering Group and Concept of Operations

Draft Conclusion SG19/13 – Adopt ATFM Communications Manual

Draft Conclusion SG19/14 – Conduct ATFM Survey

Draft Conclusion SG19/15 – Support for Global ICD for ATFN AIDC

Draft Conclusion SG19/16 – Survey of RNP 4 Equipage and Approvals

6.4 **List of Draft Decisions**

Draft Decision SG19/1 – Asia Pacific Regional Performance Objectives

Draft Decision SG19/4 – Dissolution of Western Pacific/South China Sea RVSM Scrutiny Working Group

Draft Decision SG19/17 – ATM/AIS/SAR Task List

# AGENDA ITEM 1: ADOPTION OF PROVISIONAL AGENDA

## PART II – REPORT ON AGENDA ITEMS

### Agenda Item 1: Adoption of Provisional Agenda

1.1 The meeting adopted the following agenda:

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|---|---|
| Agenda Item 1: | Adoption of Provisional Agenda |
| Agenda Item 2: | Review the APANPIRG/19 Report and subsequent ANC/Council Actions with respect to ATM/AIS/SAR issues |
| Agenda Item 3: | Regional Performance Framework and Metrics |
| Agenda Item 4: | Review and progress the tasks assigned to the ATM/AIS/SAR/SG by APANPIRG |
| Agenda Item 5: | Consider problems and make specific recommendations concerning the provision of ATM/AIS/SAR in the Asia/Pacific Region |
| Agenda Item 6: | Review of ATS coordination group meetings |
| Agenda Item 7: | Review progress of the Regional Airspace Safety Monitoring Advisory (RASMAG) |
| Agenda Item 8: | Review developments relating to CNS/ATM implementation |
| Agenda Item 9: | Deficiencies in the Air Navigation field |
| Agenda Item 10: | Update the ATM/AIS/SAR Task List |
| Agenda Item 11: | Any other business |
| Agenda Item 12: | Date and venue for next meeting |

# AGENDA ITEM 2: REVIEW THE APANPIRG/19 REPORT AND SUBSEQUENT ANC/COUNCIL ACTIONS, WITH RESPECT TO ATM/AIS/SAR ISSUES

**Agenda Item 2: Review the APANPIRG/19 Report and subsequent ANC/Council Actions, with respect to ATM/AIS/SAR issues**

**Review of ANC/Council Actions on the Report of APANPIRG/19**

2.1 The meeting reviewed the actions taken by the Air Navigation Commission (ANC) on the Report of the Nineteenth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/19, 1-5 September 2008) and subsequent actions by the Air Navigation Commission in its follow-up review (26 February, 2009 (180-7) — AN-WP/8368).

2.2 Detailed comments by the Commission in its review of the Report of APANPIRG/19 are provided in **Appendix A** to the Report on Agenda Item 2.

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2.3 In regard to action by the ICAO Council, in accordance with the revised established practice (C-DEC 177/14, 20 March 2006 refers), Planning and Implementation Regional Group (PIRG) reports would not be presented to the Council unless the Commission deemed it necessary for the Council to take action on any of the conclusions. In the case of the APANPIRG/19 Report, as there were no specific items that required Council action the Commission did not submit the report to the Council.

2.4 In relation to paragraphs 3.2.37 and 3.2.38 of the APANPIRG/19 Report, the meeting noted that the ANC had concurred in principle with APANPIRG's encouragement to States to review Standard Instrument Departures (SIDs) on a case-by-case basis with a view to lifting speed restrictions where appropriate, but considered that the issue should be addressed on a global basis, requesting the Secretary General to take action accordingly. Whilst supporting the global approach to reviewing the speed restrictions Hong Kong, China considered that air navigation service providers (ANSPs) should also have the discretion to manage speed restrictions within each set of unique circumstances and on a case by case basis.

2.5 IATA thanked Hong Kong, China for raising the issue. While there is no requirement for speed limitations in Class A, B and C airspaces there are problems such as bird hazards which may require manufacturer's advice on speeds to be followed. IATA endorses a global solution but believes that need not preclude a State making its own decisions on speed control where necessary.

**Review of outstanding Conclusions and Decisions of APANPIRG**

2.6 The meeting reviewed and updated the list of outstanding Conclusions and Decisions of APANPIRG meetings prior to and including APANPIRG/18 (September 2007) with respect to ATM/AIS/SAR issues, as shown at **Appendix B** to the Report on Agenda Item 2. The meeting also reviewed and updated the list of outstanding Conclusions and Decisions from the last APANPIRG meeting, APANPIRG/19, with respect to ATM/AIS/SAR issues, as shown at **Appendix C** to the Report on Agenda Item 2. In particular, the Secretariat highlighted Decision 19/57 which had adopted amendments to the Terms of Reference (TOR) of the Sub-Group to enable consideration of the Global Aviation Safety Plan (GASP) in planning processes and ensure environmental initiatives are identified and progressed. The updated TOR have been included as **Appendix D** to the Report on Agenda Item 2.

2.7 The updated lists of APANPIRG Conclusions and Decisions will be presented to APANPIRG/20, to be held from 7 to 11 September 2009.

2.8 The Chairman questioned the practice of closing items on the basis of issuance of a State Letter. The Secretariat explained that in items such as Conclusion 19/19 the deliverable was a State Letter as the Conclusion required that States be informed. The subsequent implementation status of the actions required will be tracked and reported through the relevant working groups and task forces, as appropriate.

**Attachment**

# ACTION PLAN — FOLLOW-UP TO SELECTED CONCLUSIONS/DECISIONS OF APANPIRG/19 MEETING
## (as approved by the Air Navigation Commission on 26 February (180-7) — AN-WP/8368

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/1<br><br>D | **Regional Performance Framework** | That, a regional performance framework be adopted on the basis of ICAO guidance material and aligned with the Global Air Navigation Plan and the Global ATM Operational Concept. The performance framework should include identification of regional performance objectives taking into consideration user expectations (to be mapped against current work) and completion of regional performance framework forms based on the sample shown in Appendix A to the Report on Agenda Item 3. | Develop performance framework | ICAO APAC Office<br><br>Subgroups<br><br>APANPIRG | Regional Performance objectives;<br><br>Performance Framework Forms | Noted and that APANPIRG is requested to take into account the user expectations in the development of performance framework forms. | June 2009 |
| C 19/2<br><br>D | **National Performance Framework** | That, States be invited to adopt a national performance framework on the basis of ICAO guidance material and aligned with the regional performance objectives, the regional air navigation plan and the Global ATM Operational Concept. The performance framework should include identification of national performance objectives taking into consideration user expectations (to be mapped against current work) and completion of national performance framework forms based on the sample shown in Appendix A to the Report on Agenda Item 3. | Notify States | ICAO APAC Office<br><br>States | State letter<br><br>National Performance objectives;<br><br>Performance Framework Forms | Noted and that States of the Asia/Pacific Regions were requested to take into account the user expectations in the development of performance framework forms. | Feb 2009<br><br>TBD |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/3<br><br>A D | **Assistance in South West Pacific Small Island States and Mongolia, Myanmar and Timor Leste in implementing the requirements of aerodrome certification and SMS** | That, in recognizing the importance on the implementation of Annex 14, Volume I provisions related to aerodrome certification and SMS in the South West Pacific Small Island States and Mongolia, Myanmar and Timor-Leste, ICAO considers providing assistance to these States in order to build their capacity to provide the required services in a sustainable and cost efficient manner.<br><br>*[Note: An appropriate form of providing assistance could include establishment of an ICAO technical cooperation project with funding sought from donor agencies.]* | Assist in establishment of TC Project | ICAO HQ/ TCB/FAP | Appropriate assistance Project | Supported for the establishment of ICAO TC project. | 2009/2010 |
| **Paragraphs**<br><br>**3.2.37 and 3.2.38**<br><br>**A D** | **Fuel Savings through Lifting of Speed Restrictions for SIDs** | Noted the advice that speed restrictions were imposed in standard instrument departure (SID) design for obstacle clearance requirements, and were used to regulate air traffic in terminal areas with different aircraft types and also where the same aircraft type fly at different speeds. APANPIRG, in order to encourage fuel savings, agreed that the States be encouraged to review SIDs on a case-by-case basis with a view to lifting speed restrictions where appropriate. | Issue form<br><br>State letter | ICAO APAC Office | Case by case approach for lifting speed restrictions | Concurred in principle with this initiative. However did not support the case by case approach and requested the Secretary General to address the issue on a global basis. | TBD |
| **D 19/6**<br><br>**A, D, E** | **Establishment of an ICAO Flight Plan & ATS Message Implementation Task Force** | That, an Asia/Pacific ICAO Flight Plan & ATS Message Implementation Task Force (FPL&AM/TF), with terms of reference as outlined in **Appendix C** to the APANPIRG/19 Report on Agenda Item 3.2, be established to develop a regional transition strategy and procedures to ensure the streamlined implementation of the amended ICAO flight planning and associated ATS message provisions. | Establish Task Force | ICAO APAC Office | Schedule first meeting | Noted and that the Secretariat is developing more detailed guidance, scheduled to be released in February 2009. | First meeting of FPL&AM/ TF will be held in April 2009 |

| Conc/Dec — Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/18<br><br>A D | **ATS Message Management Center (AMC) Software** | That, to facilitate implementation and management of ATN in the Asia/Pacific Regions, ICAO be urged to facilitate transfer of Eurocontrol AMC Software to Aerothai and to allow Aerothai to modify the Software to suit the requirements of the Asia/Pacific Regions. | Prepare Issue form<br><br>Coordinate with parties concerned. | ICAO APAC Office<br><br>ICAO HQ ANB/CNS/AIRS | Sent to HQ<br><br>MOU signed and AMC software transferred. | Noted that the Secretariat is reviewing the feasibility | Completed<br><br>June 2009 |
| C 19/20<br><br>D | **Adoption of ATN over IPS in addition to ATN over OSI** | That, considering the inclusion of ATN over IPS SARPs in ICAO Annex 10, Volume 3 and to support global harmonization of ATN implementations, States hosting BBIS be urged to implement ATN over IPS in addition to ATN over OSI and complete this implementation of Dual Stack ATN (ATN/OSI and ATN/IPS) by 2011. | Notify States hosting BBIS. | ICAO APAC Office<br><br>States | State letter<br><br>ATN over IPS | Noted | Completed<br><br>2011 |
| C 19/24<br><br>A D E | **Satellite Communications Service Performance** | That,<br><br>a) States and international organizations be requested to liaise with satellite service providers to establish a mechanism to maintain and modernize the satellite communication infrastructure; and<br><br>b) ICAO be invited to organize a meeting by the end 2008 for stakeholders to review the performance and provision of satellite data link communications in the Asia/Pacific Region and find a solution. | a) Notify States and Intl' Organizations<br><br>b) To organize a meeting | ICAO APAC Office<br><br>ICAO APAC Office | State letter<br><br>Review of performance and provision of satellite data link communications | Noting the similar developments in different regions, requested the Secretariat to address the subject of ensuring availability of SATCOM in a comprehensive manner. | Feb 2009<br><br>Dec 2008<br><br>Meeting rescheduled for April 2009 due to closure of airports in Thailand |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/25<br><br>D | **ASIA/PAC PBN Implementation Plan** | That, the Asia/Pacific PBN Implementation Plan as provided in Appendix G to the Report on Agenda Item 3.4 be adopted and published as the interim edition based on which, States be urged to developed their national PBN implementation plan and provide feedback to the ICAO Regional Office. | Notify States<br>Publish on website | ICAO APAC Office | Regional PBN plan to be published on website and States notified | Noted | Completed |
| C 19/27<br><br>D | **Flight Procedure Design Office** | That, ICAO continues to develop the concept of a Flight Procedure Design Office (FPO) taking into account proposals submitted by the States with emphasis on the role, responsibility and financial mechanisms. | Prepare Issue form | ICAO APAC Office<br><br>ICAO HQ ANB/ATM | Issue form sent to HQ<br><br>Establishment of FPO | Noted that the Secretariat is on the task of studying the proposals received and would take into account the concerns expressed by the ANC in this regard. | Completed<br><br>May 2009 |
| C 19/28<br><br>A D | **Continuous Descent Final Approach (CDFA) and Baro-VNAV** | That, in order to reduce the likelihood of CFIT accidents, States be urged to<br><br>a) review non-precision approach procedures with LNAV lines of minima to include CDFA profile; and<br><br>b) include the Baro-VNAV design in the current and new RNP APCH approaches and consequent LNAV/VNAV approach minima. | Notify States | ICAO APAC Office | State letter | Noted | Completed |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/29<br><br>D | **Separation Standards for PBN** | That, ICAO be invited to expedite development and publication of separation standards for use in implementation of the PBN RNAV 5, RNAV 2, RNAV 1 and Basic-RNP 1 navigation specifications. | Prepare Issue form | ICAO APAC Office<br><br>ICAO HQ ANB/ATM | Issue Form sent to HQ<br><br>Development of separation standards for use in implementation of the PBN RNAV 5, RNAV 2, RNAV 1 and Basic-RNP | Noted that the task has already been taken up by SASP and is developing SARPs on the basis of obstacle clearance criteria for separation of aircraft in terminal airspace with a target date of 2010. | Completed<br><br>2010 |
| C 19/31<br><br>D | **Revision of the Strategy for the Provision of Navigation Services in the Asia/Pacific Regions** | That, the revised Strategy for the provision of navigation services provided in Appendix J to the Report on Agenda Item 3.4 be adopted and provided to States | Publish on website | ICAO APAC Office | Publish on Website and States notified | Noted | Feb 2009 |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/37<br><br>D | **Revised Mandate Regional ADS-B OUT Implementation** | States intending to implement ADS-B based surveillance service, be urged to<br><br>a) determine ADS-B OUT equipage mandates based upon the ability to provide ADS-B OUT separation services;<br><br>b) expedite the implementation of ADS-B OUT in accordance with the Regional Air Navigation Plan and the provision of separation services based on ADS-B OUT;<br><br>c) publish their equipage mandates as soon as possible, with a target publication date of no later than 2010 so that operators can plan ahead their forward purchasing and retrofit;<br><br>d) choose a date after mid-2012 on which the ADS-B out equipage mandate will become effective in airspace served by ADS-B ground stations with sufficient transition period to enable fleet equipage.<br><br>*Note: The implementation would require aircraft equipped with avionics compliant with either;* | Notify States | ICAO APAC Office<br><br>States<br><br>States | State letter<br><br>Publish their ADS-B OUT equipage mandate<br><br>ADS-B OUT equipage mandate will become effective in airspace served by ADS-B ground stations | Noted | Completed<br><br>2010<br><br>After mid 2012 |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| | | 1) *Version 0 ES as specified in Annex 10, Volume IV, Chapter 3, Paragraph 3.1.2.8.6 (up to and including Amendment 82 to Annex 10) and Chapter 2 of the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260) to be used till at least 2020. or*<br><br>2) Version 1 ES as specified in Chapter 3 of the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260A) | | | | | |
| C 19/39<br><br>D | **Regional Surveillance Strategy for Asia/Pacific Regions** | That, the revised Regional Surveillance Strategy for the Asia/Pacific Regions provided in the Appendix R to the Report on Agenda Item 3.4 be adopted. | Publish on the web site. | ICAO APAC Office | Publish on website and States notified. | Noted | Feb 2009 |

| Conc/Dec — Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/43<br><br>D | **Training for the new WAFS gridded forecasts** | That, in order to facilitate the implementation by the States of the new WAFS gridded forecasts,<br><br>a) WAFC Provider States, in coordination with ICAO and WMO, be invited to organize training on the use of the new WAFS gridded forecasts for icing, turbulence and cumulonimbus clouds; and<br><br>b) WAFSOPSG be invited to consider, in addition to the planned regional training seminars, developing alternative methods for provision of training to the States on the new gridded forecasts for icing, turbulence and cumulonimbus clouds in order to ensure that a maximum number of WAFS users in the States will have access to the training in the most efficient way.<br><br>*Note: The alternative training methods include computer based training products distributed to States and web-based training.* | a) Organize training<br><br>b) Develop alternative methods for provision of training to the States on the new gridded forecasts for icing, turbulence and cumulonimbus clouds | ICAO HQ ANB/MET/AIM<br><br>ICAO HQ ANB/MET/AIM | Conduct training programme on the use of the new WAFS gridded forecasts for icing, turbulence and cumulonimbus cloud<br><br>Alternative training methods | Noted and requested the Secretary General to invite WAFC Provider States, in coordination with ICAO and WMO, to organize the required training. | Dec 2010<br><br>Dec 2010 |
| C 19/44<br><br>D | **Use of administrative messages for errors in the WAFS SIGWX forecasts** | That,<br><br>a) WAFSOPSG be requested to develop as soon as possible the procedures for the issuance of administrative messages by the WAFCs drawing attention to errors identified in the current WAFS SIGWX forecasts (in the BUFR code and PNG chart forms); and<br><br>b) ICAO be invited to develop guidance for the meteorological offices and aviation users on the use of the above administrative messages. | Prepare Issue form<br><br>Development of procedures<br><br>Develop guidance on the use of the above administrative messages. | ICAO APAC Office<br><br>ICAO HQ ANB/MET/AIM<br><br>ICAO HQ ANB/MET/AIM | Issue Form sent to HQ<br><br>The procedures for the issuance of administrative messages by the WAFCs<br><br>Guidance | Noted and invited WAFSOPSG to develop procedures for the issuance of administrative messages and the guidance. | Completed<br><br>2010<br><br>2010 |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/49<br><br>D | **Guidance on the period of validity of TAF included in the HF VOLMET broadcasts** | That, ICAO:<br><br>a) be invited to urgently review the concerns expressed with regard to the non-suitability of 30-hour TAF for HF VOLMET broadcasts as described in detail in the report of CNS/MET SG/12 meeting; and<br><br>b) provide urgent guidance to the States concerned taking into consideration the user requirements expressed by IATA and IFALPA, before the implementation date of the new TAF provisions. | Prepare Issue form<br><br>Review<br><br>Guidance to the States | ICAO APAC Office<br><br>ICAO HQ ANB/MET/AIM<br><br>ICAO HQ ANB/MET/AIM | Issue form sent to HQ<br><br>Review<br><br>Required guidance | Noted and appreciated the quick response of the Secretariat. | Completed<br><br>Completed<br><br>Completed |
| C 19/50<br><br>D | **Issues related to TAF code** | That, ICAO, in coordination with WMO be invited to consider the following issues related to TAF:<br><br>a) providing explicit definition of the geographical area that the TAF covers with consistency between this definition for the TAF and METAR;<br><br>b) establishment of amendment criteria for the temperature group in the TAF; and<br><br>c) establishment of provision for multiple occurrences of operationally significant maximum or minimum temperatures in a 30-hour TAF. | Prepare Issue form<br><br>Review the issues concerning TAF | ICAO APAC Office<br><br>ICAO HQ ANB/MET/AIM | Issue form sent to HQ<br><br>Amendment criteria to be included in Amendment 76 to Annex 3 as necessary; and guidance | Supported the request and called upon the Secretary General to address the issues in Conclusion 19/50, with the assistance of the AMOFSG. | Completed<br><br>2011 |

| Conc/Dec --- Strategic Objectives* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Proposed Follow-up | Responsibility | Deliverable | ANC action | Reporting/ Completion Date |
|---|---|---|---|---|---|---|---|
| C 19/54<br><br>D | **Improvements to aeronautical climatological information provision** | That, ICAO, in coordination with WMO and IATA, be invited to:<br><br>a) study the evolving user requirements for the provision of aeronautical climatological information, in view of the increasing importance of climatological data in the decision making process and strategic planning of airline operations;<br><br>b) based on the results of the study, consider developing proposal for improvements to aeronautical climatological information provision. | Prepare Issue form<br><br>proposals for improvements to aeronautical climatological information. | ICAO APAC Office<br><br>ICAO HQ ANB/MET/AIM | Issue form sent to HQ<br><br>Appropriate provisions | In view of the important scope of this issue no action should be taken until the need for the provision of improved aeronautical climatological information be assessed by a conjoint ICAO/WMO Meeting. | Completed<br><br>TBD |
| C 19/56<br><br>C,D | **Common methodology for environmental benefits** | That, ICAO be invited to establish and maintain a simple and cost effective common methodology to assess and document environmental benefits to airspace and CNS/ATM planning initiatives. | Prepare Issue form<br><br>Common methodology | ICAO APAC Office<br><br>ICAO HQ ATB/ENV | Issue Form sent to HQ<br><br>Appropriate guidance | Noted that the task of developing a common methodology to assess environmental benefits of CNS/ATM systems is already included in the work programme of CAEP. | Completed<br><br>2010 |

* **Note:** ICAO has established the following Strategic Objectives for the period 2005-2010:

**A: Safety** - *Enhance global civil aviation safety*;
**B: Security** - *Enhance global civil aviation security*
**C: Environmental Protection** - *Minimize the adverse effect of global civil aviation on the environment*
**D: Efficiency** - *Enhance the efficiency of aviation operations*
**E: Continuity** - *Maintain the continuity of aviation operations*
**F: Rule of Law** - *Strengthen law governing international civil aviation.*

**TBD: To be determined**

— END —

# STATUS OF OUTSTANDING CONCLUSIONS/DECISIONS OF APANPIRG IN ATM/AIS/SAR FIELDS

| Report Reference ---------- Conc/Dec No | Action by ANC/ Council | Decision/Conclusion Title/ ANC/Council Action, if any | Action by States/ICAO | Status Dated May 08 |
|---|---|---|---|---|
| **C16/19** | | **Study of States' preparedness to implement safety management systems**<br><br>That, a study of States' preparedness to implement ICAO safety management systems in accordance with Annex 11 be undertaken by the Asia/Pacific Regional Office in conjunction with the ATS coordination groups and RASMAG by the first quarter of 2006, and a plan of action developed to be reported to APANPIRG/17 in September 2006. | Coordination with States in process.<br><br>However SIP proposal for additional ATS SMS training via field visits was developed by Regional Office and approved by Council of ICAO, for implementation in last quarter 2006. SIP requires participation of one fully funded State safety management expert to assist. SIP Workshop conducted 25-29 September 2006, no availability of State official to assist.<br><br>RASMAG/9 (May 08) considered that this Conclusion had been overtaken by events and made recommendation to APANPIRG/19 that it be 'Closed'. | ~~**On going**~~<br><br>**CLOSED** |

TBD = To be determined

# STATUS OF OUTSTANDING CONCLUSIONS/DECISIONS OF APANPIRG/17 IN ATM/AIS/SAR FIELDS

| Concl/Dec No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Status Dated May 08 |
|---|---|---|---|---|---|---|
| **C 17/2**<br><br>**A , D** | **Implementation of ALLPIRG/5 conclusions by States** | That States of the Asia/Pacific Region take action to implement the following conclusions of ALLPIRG/5:<br>Conclusions 5/1, 5/4, 5/5, 5/7, 5/8,5/9, 5/11, 5/13 and 5/16 | Implement conclusions | ASIA/PAC States | ICAO State letter Ref: AN 3/8:AP0106/06 dated 9 Nov 06 | ~~**On going**~~ **CLOSED** sufficient time has passed since ALLPIRG/5 allowing the work associated with these items to be incorporated in States normal work |
| **C 17/3**<br><br>**A , D** | **Implementation of ALLPIRG/5 conclusions by international organizations** | That international organizations take action to implement the following conclusions of ALLPIRG/5:<br>Conclusions 5/2, 5/4, 5/5, 5/7, 5/13 and 5/16 | Implement conclusions | Intl organizations | ICAO State letter Ref: AN 3/8:AP-MET 0109/06 dated 9 Nov 06 | ~~**On going**~~ **CLOSED** sufficient time has passed since ALLPIRG/5 allowing the work associated with these items to be incorporated in international organisations' normal work |

TBD = To be determined

| Concl/Dec No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Status Dated May 08 |
|---|---|---|---|---|---|---|
| **D 17/10**<br><br>**D** | **Establish APANPIRG Regional Performance Framework Task Force** | That, recognizing the new regional planning methodologies precipitated by the second amendment to the Global Air Navigation Plan and the new ICAO business planning requirements, a Task Force be established to develop a proposal/framework for consideration by APANPIRG/18 for incorporating the performance based approach into the work programme of APANPIRG and its contributory bodies. The Terms of Reference of the Task Force are provided in Appendix B to the Report on Agenda Item 2.1.<br><br>***Follow up action:***<br><br>Further action to be deferred until the outcomes of two activities at ICAO HQ are known.<br><br>1. The ANC study of the merits of PIRGs and the value added from the PIRGs activities, particularly with respect to Business Plan implementation activities, which may result in changes to the mandate, activities and terms of reference of the PIRGs.<br>2. Development by ICAO HQ of an Air Navigation work programme to integrate where appropriate regional office activities. | Creation of TF<br><br>Teleconference<br><br>Follow work programme established with TORs<br><br>First meeting of RPF/TF was held 2 September 2007. Further action deferred until guidance in Manual on Global Performance of the Air Navigation System (Doc 9883) is available, expected late 2008. | APANPIRG<br><br>TF<br><br>TF | TOR<br><br>TF Report<br><br>Regional performance framework<br><br>Report to<br>− ATM/AIS/ SAR/17<br>− CNS/MET/11<br>− APANPIRG/18 | ~~On-going~~ **CLOSED**<br>Overtaken by events at HQ and no specific action by the Task Force is identified |

TBD = To be determined

| Concl/Dec No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Status Dated May 08 |
|---|---|---|---|---|---|---|
| **C 17/14**<br><br>**D** | **Improvement of aeronautical information exchange and management** | That, in order to increase the reliability and integrity of the aeronautical information in support of navigation functions, ICAO be invited to establish, as a matter of urgency, a standard model for the electronic exchange of aeronautical information.<br><br>***Follow up action:***<br><br>During March 2008, the Air Navigation Commission agreed that:<br><br>a) a new study group, to be known as the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG), be established to assist the Secretariat with the development of:<br>i) a global strategy/roadmap for the transition from AIS to AIM to be delivered in draft by early 2009;<br>ii) SARPs and guidance material, expected by 2010, related to the provision of a standard aeronautical information conceptual model and standard aeronautical information exchange model to enable the global exchange of data in digital format;<br>3) other SARPs, guidance and training material necessary to support AIM implementation; and<br>b) the AISMAPSG and the ADMSG be disbanded. | Establish a standard model for the electronic exchange of aeronautical information. | ICAO HQ | Appropriate provisions | **CLOSED**<br>actions being managed by ICAO HQ |

TBD = To be determined

| Concl/Dec No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Status Dated May 08 |
|---|---|---|---|---|---|---|
| **C 17/43**<br><br>**D** | **Development of provisions on MET/ATM coordination** | That, in recognizing the importance of the meteorological support for the air traffic management,<br><br>a) ICAO Regional Office conduct a survey of the evolving requirements for meteorological information and services in support of air traffic management; and<br><br>b) the results of the survey above, be referred to the appropriate ICAO body in view of potential extension of the existing provisions on the meteorological services for ATS, to cover the other ATM fields. | Conduct survey<br><br>Develop SARPs | MET/ATM TF, Regional Office<br><br>ICAO HQ | Questionnaire for the survey<br><br>Survey Report to be presented to<br>− ATM/AIS/ SAR/17<br>− CNS/MET/11<br><br>Appropriate provisions | COMPLETED<br><br>Survey has been completed.<br><br>Result of the survey provided to HQ. |
| **D 17/47**<br><br>**A** | **Task Force to establish Regional Airspace Safety Monitoring Committees** | That a Task Force be established to develop and distribute to States by 30 June 2007 implementation proposals for the establishment of Regional Airspace Safety Monitoring Committees (RASMC). The Task Force would work in accordance with the terms of reference in **Appendix A** to the Report on Agenda Item 2.4 and use, *inter alia*, recent ICAO guidance materials in relation to the global approach for the funding of airspace safety monitoring. | Establish TF<br><br>Develop proposal for RASMB<br><br>First meeting of RASMC/TF held on 15 Feb 07. APANPIRG/18 considered outcomes and disbanded RASMC/TF | APANPIRG<br><br>TF | TOR<br><br>Report to RASMAG | **CLOSED** |

TBD = To be determined

| Concl/Dec No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Status Dated May 08 |
|---|---|---|---|---|---|---|
| **C 17/53**<br><br>**A** | **A regional on-line database of air navigation deficiencies in ASIA/PAC Region** | That, in order to ensure transparency and facilitate resolution of deficiencies, ICAO Regional Office be invited to establish a regional on-line database of air navigation deficiencies and provide secure access to States' Administrations and other users concerned. | Establish on-line database. | Regional Office, DRTF, ICAO HQ | On-line database | **COMPLETED**<br>Online database of air navigation deficiencies has been created. |
| **C 17/54**<br><br>**A** | **Deficiency resolution objective for ASIA/PAC States** | That,<br><br>a) all ASIA/PAC States listed in the APANPIRG List of deficiencies be urged to establish action plans with fixed target dates for resolution of all safety related deficiencies and inform ICAO Regional Office by mid 2007 of their plans; and<br><br>b) the need for urgent action in resolving safety related deficiencies be brought to the attention of DGCA/43 conference in December 2006. | Establish action plans<br><br>Report to DGCA. | States<br><br>Regional Office | Action plan<br><br>DP for DGCA | **CLOSED**<br>States urged to submit action plans<br><br>Reported to DGCA/43. 43rd DGCA Conference addressed this issue in action item 43/1- Resolution of Deficiencies |

*** Note:** ICAO has established the following Strategic Objectives for the period 2005-2010:
**A: Safety** - *Enhance global civil aviation safety*; **B: Security** - *Enhance global civil aviation security*; **C: Environmental Protection** - *Minimize the adverse effect of global civil aviation on the environment*; **D: Efficiency** - *Enhance the efficiency of aviation operations*; **E: Continuity** - *Maintain the continuity of aviation operations;* **F: Rule of Law** - *Strengthen law governing international civil aviation.*

TBD = To be determined

## Follow-up to APANPIRG/19 Conclusions/Decisions – Action Plan

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
|---|---|---|---|---|---|---|---|
| **C 19/1**<br><br>**D** | **Regional Performance Framework** | That, a regional performance framework be adopted on the basis of ICAO guidance material and aligned with the Global Air Navigation Plan and the Global ATM Operational Concept. The performance framework should include identification of regional performance objectives taking into consideration user expectations (to be mapped against current work) and completion of regional performance framework forms based on the sample shown in **Appendix A** to the Report on Agenda Item 3. | Develop performance framework | ICAO APAC Office<br><br>Sub Groups<br><br>APANPIRG | Regional Performance objectives;<br><br>Performance Framework Forms | Jun 2009 | Revised target date July 2009. [ATM/AIS/SAR/ SG scheduled June 09, and CNS/MET SG meeting is scheduled July 09].<br><br>***ATM/AIS/SAR/ SG/19 prepared PFF forms and associated metrics for consideration by CNS/MET SG and APANPIRG.***<br><br>ANC action: Noted and that APANPIRG is requested to take action into account the user expectations in the development of performance framework forms. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
|---|---|---|---|---|---|---|---|
| **C 19/2**<br><br>**D** | **National Performance Framework** | That, States be invited to adopt a national performance framework on the basis of ICAO guidance material and aligned with the regional performance objectives, the regional air navigation plan and the Global ATM Operational Concept. The performance framework should include identification of national performance objectives taking into consideration user expectations (to be mapped against current work) and completion of national performance framework forms based on the sample shown in **Appendix A** to the Report on Agenda Item 3. | Notify States | ICAO APAC Office<br><br>States | State Letter<br><br>National Performance objectives;<br><br>Performance Framework Forms | Feb 2009<br><br>TBD | **COMPLETED**<br>State letter dated 15 January<br>ICAO Special Implementation Project − Workshop On the development of national performance framework to achieve a global ATM system was conducted in BKK from 9-13 March 2009.<br>ANC action: Noted and that states of Asia/Pacific Regions were requested to take action into account the user expectations in the development of performance framework forms. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
|---|---|---|---|---|---|---|---|
| **C 19/3**<br><br>**A D** | **Assistance in South West Pacific Small Island States and Mongolia, Myanmar and Timor Leste in implementing the requirements of aerodrome certification and SMS** | That, in recognizing the importance on the implementation of Annex 14, Volume I provisions related to aerodrome certification and SMS in the South West Pacific Small Island States and Mongolia, Myanmar and Timor-Leste, ICAO considers providing assistance to these States in order to build their capacity to provide the required services in a sustainable and cost efficient manner.<br><br>[*Note: An appropriate form of providing assistance could include establishment of an ICAO technical cooperation project with funding sought from donor agencies.]* | Assist in establishment of TC Project | ICAO HQ/ICAO APAC Office | appropriate assistance Project | 2009/ 2010 | SL dated 13/02/09 sent to these States to update status on implementation.<br><br>ANC: Supported for the establishment of ICAO TC Project. |
| **D 19/4**<br><br>**A D** | **Dissolution of the Regional Performance Framework Task Force (RPF/TF)** | That, recognizing the performance based planning process utilizing "Performance Framework Forms (PFF)" promulgated by ICAO during 2008 had overtaken the Terms of Reference of the Regional Performance Framework Task Force (RPF/TF), the RPF/TF be dissolved.<br>. | | | | | **COMPLETED** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **D 19/5**<br><br>**A D** | **Dissolution of the RVSM/TF** | That, following the widespread and safe implementation of RVSM throughout the Asia/Pacific Regions over a 10 year period, the Asia/Pacific RVSM Implementation Task Force (RVSM/TF) be dissolved, with effect from the close of the RVSM/TF/34 meeting (one year review of China RVSM) in late 2008, and any residual work items be allocated to the ATM/AIS/SAR Sub-Group.<br><br>***Note:*** *In dissolving the RVSM/TF, APANPIRG places on the record its highest commendation and appreciation to all parties associated with the RVSM/TF for the continuous implementation of RVSM and the very positive and quantifiable beneficial effects on safety, efficiency and the environment that have resulted directly from the work of the RVSM/TF.* | Notify States | ICAO APAC Office | State Letter | Mar 2009 | **COMPLETED**<br><br>RVSM/TF/34 meeting held in Beijing China 1-3 December 2008 actioned the dissolution of the RVSM/TF |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
|---|---|---|---|---|---|---|---|
| **D 19/6**<br><br>**A, D, E** | **Establishment of an ICAO Flight Plan & ATS Message Implementation Task Force** | That, an Asia/Pacific ICAO Flight Plan & ATS Message Implementation Task Force (FPL&AM/TF), with terms of reference as outlined in **Appendix C** to the APANPIRG/19 Report on Agenda Item 3.2, be established to develop a regional transition strategy and procedures to ensure the streamlined implementation of the amended ICAO flight planning and associated ATS Message provisions. | Establish Task Force | ICAO APAC Office | Schedule first meeting | Second quarter 2009 | First meeting of FPL&AM/TF will be held in April 2009<br><br>**COMPLETED**<br>Task Force created by State Letter Ref.:T3/10.1.20 AP009/09 (ATM) dated 19 January 2009. First meeting of FPL&AM TF conducted 17-20 March 2009, interim regional; strategy developed. FPL&AM TF/2 scheduled November 09<br><br>ANC: Noted and that the Secretariat is developing more detailed guidance scheduled to be released in Feb 2009 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C19/7**<br><br>**A D** | **RNP 4 capability for operators** | That, recognizing the significant benefits expected from the implementation of 30 NM longitudinal separation based on RNP 4, operators of Pacific fleets be urged to equip with RNP 4 avionics for oceanic airspace operations and obtain approval from the States of Registry/Operators as early as possible, but no later than 2012. | Notify States and air space users | ICAO APAC Office | State Letter | Dec 2008 | **COMPLETED**<br><br>State Letter Ref.:T3/10 AP-ATM 0063 dated 20 February 2009. |
| **C 19/8**<br><br>**A D** | **Conduct Regional Runway Safety Seminar/ Workshop** | That, noting the critical nature and persistent occurrence of runway incursions, the ICAO Asia/Pacific Regional Office, with assistance from States experienced in runway safety management and in conjunction with the COSCAPS of South Asia, South East Asia and North Asia, conduct a 3-day runway safety seminar/workshop during 2009. | Conduct Seminar/ Workshop | ICAO APAC Office, COSCAPs | Seminar/ Workshop | 2009 | Workshop is scheduled from 7 to 9 April 2009.<br><br>*COMPLETED*<br>*Workshop conducted 7-9 April 2009, results reported to ATM/AIS/SAR/ SG/19* |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/9**<br><br>**A D E** | **Support for Ad-Hoc GOLD Working Group** | That, recognizing the many benefits to be gained from the global application of harmonized FANS data link operational procedures, APANPIRG supports the work being undertaken under the auspices of the Ad-Hoc GOLD Working Group to produce a FANS Global Operational Data Link document (GOLD) and invites the Asia/Pacific Regional Office to act as the regional focal point for the Ad-Hoc GOLD Working Group. | Participation in the working group | ICAO APAC Office | Draft GOLD | ~~***Mar***~~ ***August 2009*** | ATM 1 working by correspondence with Ad-Hoc Working Group on this issue.<br><br>***Circulation draft of GOLD expected ~~May~~ August 2009; target for finalization is December 2009.*** |
| **C 19/10**<br><br>**A D** | **Future date-time for NOTAMC and NOTAMR** | Recognizing that the concerns raised in APANPIRG Conclusion 18/14 relating to use of future date-time in NOTAMC and NOTAMR have been included in the Air Navigation Commission work programme for formal resolution by 2010, States be encouraged to use relevant guidance material in the Aeronautical Information Services Manual (Doc 8126) and the Asia/Pacific Operating Procedures for AIS Dynamic Data (OPADD) in the application of Annex 15 SARPs. | Notify States | ICAO APAC Office | State Letter | Dec 2008 | **CLOSED**<br>State letter Ref.:T3/10.0, 3/10.1.6 AP001/09 (ATM) dated 05 January 2009<br><br>AIS-AIM/SG considering as amendment proposal to Annex 15 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
|---|---|---|---|---|---|---|---|
| **C 19/11**<br><br>**A D** | **Update SAR Matrix including guidance material** | That, the updated format for the SAR Capability Matrix Table and explanatory text shown in **Appendix K** to the APANPIRG/19 Report on Agenda Item 3.2 be adopted and the explanatory text be included as a perpetual attachment to the SAR Capability Matrix, to serve as guidance to States when filling in the Matrix. | Publish on website | ICAO APAC Office | Published on website | Oct 2009 | **COMPLETED** |
| **C19/12**<br><br>**A D** | **Accelerated Data Link Implementation in the Manila Flight Information Region (FIR)** | That, to enable the early realization of the full benefit of data link operation and the implementation of reduced lateral and longitudinal separations throughout the South China Sea airspace, the Philippines be invited to expedite implementation of ADS-C and CPDLC data link services in the Manila FIR. | Notify Philippines | ICAO APAC Office | State letter | Dec 2008 | **COMPLETED** State Letter Ref.: T 3/8.12.1, T 3/10.0 – AP-ATM0350, 12 December 2008 |
| **D 19/13**<br><br>**A D** | **ATM/AIS/SAR Task List** | That, the ATM/AIS/SAR Sub-Group Task List and attachments contained in Appendix A to the ATM/AIS/SAR/SG/18 Report on Agenda Item 9 be adopted as the current work programme for the ATM/AIS/SAR Sub-Group of APANPIRG. | Notify ATM/AIS/SAR/ SG | ICAO APAC Office | ATM/AIS/ SAR SG informed. Paper prepared | Jun 2009 | *COMPLETED WP/8 presented to ATM/AIS/SAR/ SG/19* |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/14**<br><br>**A D** | **Approval of China RMA as Asia Pacific RMA** | That, having met all requirements established by the Regional Airspace Safety Monitoring Advisory Group (RASMAG), the China RMA be approved as an APANPIRG Asia/Pacific RVSM Regional Monitoring Agency with responsibility for all sovereign RVSM airspaces in China. | Update RASMAG List of Competent Agencies<br><br>Notify States | ICAO APAC Office<br><br>ICAO APAC Office | List updated<br><br>State Letter | Oct 2008<br><br>Dec 2008 | **COMPLETED**<br><br>State Letter Ref.: T 3/10.0, T3/10.1.17 – AP121/08 (ATM) , 12 September 2008 |
| **C 19/15**<br><br>**A D** | **Enhanced communications between States and RVSM RMAs** | That, noting the Annex 6 provisions for the global long term monitoring of airframes used in RVSM operations and the critical role of Asia/Pacific RVSM Regional Monitoring Agencies (RMAs) in monitoring the safety of RVSM operations, the Regional Office draw the attention of States to the Long Term Height Monitoring Actions promulgated by RASMAG. In particular, States are encouraged to immediately strengthen relationships with their respective RMAs to ensure that information in relation to RVSM approval status is continuously available to RMAs. | Notify States | ICAO APAC Office | State Letter | Mar 2009 | ***Incorporated into Regional Impact Statement prepared by RASMAG for consideration by APANPIRG/20*** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **D 19/16**<br><br>**D** | **Revision to the Subject/Tasks List of ATNICG** | That, the Revised Subject/Tasks List of the ATNICG provided in **Appendix A** to the Report on Agenda Item 3.4 be adopted. | Notify ATNICG | ICAO APAC Office | ATNICG informed. Paper prepared. | May 2009 | ATNICG/4 in Singapore in May 2009 |
| **C 19/17**<br><br>**D** | **Asia/Pacific Aeronautical Telecommunication Network System Security Policy** | That, the updated "Asia/Pacific Aeronautical Telecommunication Network System Integrity Policy" provided in **Appendix B** to the Report on Agenda Item 3.4 be adopted as "Asia/Pacific Aeronautical Telecommunication Network System Security Policy". | Publish on website | ICAO APAC Office | Published on website. States notified | Oct 2008 | **COMPLETED**.<br><br>State letter dated 14/10/08 |
| **C 19/18**<br><br>**A D** | **ATS Message Management Center (AMC) Software** | That, to facilitate implementation and management of ATN in Asia/Pacific Region, ICAO be urged to facilitate transfer of Eurocontrol AMC Software to Aerothai and to allow Aerothai to modify the Software to suit the requirements of Asia/Pacific Region. | Coordinate with parties concerned.<br><br>Prepare Issue Form | ICAO HQ<br><br>ICAO APAC Office | MOU signed and AMC software transferred.<br><br>Sent to HQ | May 2009. Revised June 2009.<br><br>Dec 2008 | Coordination being carried out with HQ and Aerothai.<br><br>ANC: Noted that the secretariat is reviewing the feasibility.<br><br>**COMPLETED** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/19**<br><br>**A D** | **Implementation of AIDC in Asia and Pacific Regions** | That, States be urged to expedite implementation of AIDC between neighboring ATS facilities in accordance with the Regional Air Navigation Plan and the Asia/Pacific AIDC ICD. | Notify States | ICAO APAC Office | State Letter | Dec. 2008 | **COMPLETED** 10/12/08 |
| **C 19/20**<br><br>**D** | **Adoption of ATN over IPS in addition to ATN over OSI** | That, considering the inclusion of ATN over IPS SARPs in ICAO Annex 10, Volume 3 and to support global harmonization of ATN implementations, States hosting BBIS be urged to implement ATN over IPS in addition to ATN over OSI and complete this implementation of Dual Stack ATN (ATN/OSI and ATN/IPS) by 2011. | Notify States hosting BBIS. | ICAO APAC Office<br><br>States | State Letter<br><br>ATN over IPS | Dec. 2008<br><br>2011 | **COMPLETED.**<br><br>**ANC- Noted** |
| **C 19/21**<br><br>**D** | **Amendment to Asia/Pacific Regional AMHS MTA Routing Policy** | That, the revised Asia/Pacific AMHS MTA Routing Policy placed at **Appendix C** to the Report on Agenda Item 3.4 be adopted. | Publish on website | ICAO APAC Office | Published on website | Mar. 2009 | **COMPLETED** |
| **C 19/22**<br><br>**D** | **Amendment to FASID Tables CNS – 1B and CNS – 1C** | That, FASID Tables CNS – 1B ATN Router Plan and Table CNS – 1C AMHS Routing Plan, be amended by replacing them with the Tables provided in **Appendices D and E** to the Report on Agenda Item 3.4 in accordance with the established procedure. | Prepare amendment proposal | ICAO APAC Office | Amendment proposal processed | Mar 2009 | **COMPLETED** amendment proposal processed 27/01/09 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/23**<br><br>**D** | **Amendment to Asia/Pacific AMHS Manual.** | That, Annex E and Annex F provided in **Appendix F** to the Report on Agenda Item 3.4 be adopted as Annexes to the Guidance Document for AMHS Conformance Testing (AMHS Manual). | Publish on website | ICAO APAC Office | Published on website and States notified | Nov. 2008 | **COMPLETED 19/11/08** |
| **C 19/24**<br><br>**A D E** | **Satellite Communications Service Performance** | That,<br>a) States and International Organizations be requested to liaise with satellite service providers to establish a mechanism to maintain and modernize the satellite communication infrastructure; and<br><br>b) ICAO be invited to organize a meeting by the end 2008 for stakeholders to review the performance and provision of satellite data link communications in the Asia/Pacific Region and find a solution. | a) Notify States and Intl' Organizations<br><br>b ) To organize a meeting | ICAO APAC Office<br><br>ICAO APAC Office | State Letter<br><br>Meeting conducted | Feb 2009<br><br>Dec 2008<br><br>Revised target date- April 2009 | **COMPLETED** 16/02/09<br><br>Meeting postponed Dec 2008 Meeting was deferred due airports closure in Thailand, will be held in April 2009<br><br>***Meeting further deferred due civil circumstances in Thailand, now scheduled late August 2009***<br><br>ANC: noting the similar developments in different Regions. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| | | | | | | | Requested the secretariat to address the subject of ensuring availability of SATCOM in a comprehensive manner. |
| **C 19/25**<br><br>**D** | **ASIA/PAC PBN Implementation Plan** | That, the Asia/Pacific PBN Implementation Plan as provided in **Appendix G** to the Report on Agenda Item 3.4 be adopted and published as the interim Edition based on which, States be urged to developed their national PBN implementation plan and provide feedback to the ICAO Regional Office. | Notify States<br>Publish on website | ICAO APAC Office | State letter. Published on website and States notified | Nov. 2008 | **COMPLETED** 19/11/08<br><br>ANC: Noted |
| **C 19/26**<br><br>**A D** | **Investigation DME based RNAV** | That, in the interest of efficiency, States with DME coverage extending beyond their FIRs be requested to consider allowing neighboring States to develop PBN procedures utilizing these DMEs. | Notify States with extended DME coverage | ICAO APAC Office | State Letter | Feb 2009 | **COMPLETED** 24/03/09 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/27**<br><br>**D** | **Flight Procedure Design Office** | That, ICAO continues to develop the concept of a Flight Procedure Design Office taking into account proposals submitted by the States with emphasis on the role, responsibility and financial mechanisms. | Prepare Issue Form | ICAO APAC Office<br><br>ICAO HQ | Issue form sent to HQ<br><br>Establishment of FPO | Dec 2008<br><br>May 2009 | **COMPLETED**<br>China selected to host FPP<br><br>ANC Action: noted that the Secretariat is on the task of studying the proposals received and would take into account the concerns expressed by the ANC in this regard. |
| **C 19/28**<br><br>**A D** | **Continuous Descent Final Approach (CDFA) and Baro-VNAV** | That, in order to reduce the likelihood of CFIT accidents, States be urged to<br><br>a) review non-precision approach procedures with LNAV lines of minima to include CDFA profile; and<br><br>b) include the Baro-VNAV design in the current and new RNP APCH approaches and consequent LNAV/VNAV approach minima. | Notify States | ICAO APAC Office | State Letter | Oct 2008 | **COMPLETED**<br>State letter dated 14/10/08<br><br>ANC: Noted |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/29**<br><br>**D** | **Separation Standards for PBN** | That, ICAO be invited to expedite development and publication of separation standards for use in implementation of the PBN RNAV 5, RNAV 2, RNAV 1 and Basic-RNP 1 navigation specifications. | Prepare Issue Form | ICAO APAC Office<br><br>ICAO HQ | Issue Form sent to HQ<br><br>development of separation standards for use in implementation of the PBN RNAV 5, RNAV 2, RNAV 1 and Basic-RNP | Dec 2008<br><br>2010 | **COMPLETED**<br><br>ANC action: noted that the task has already been taken up by SASP and is developing SARPs on the basis of obstacle clearance criteria for separation of aircraft in terminal airspace with a target date of 2010. |
| **D 19/30**<br><br>**D** | **Revision to the Terms of Reference of the PBN Task Force** | That, the Revised Terms of Reference of the PBN Task Force provided in **Appendix I** to the Report on Agenda Item 3.4 be adopted. | Notify PBN Task Force | ICAO APAC Office | Paper prepared | Mar 2009 | **COMPLETED** TF reviewed and proposed to amend TOR |
| **C 19/31**<br><br>**D** | **Revision of the Strategy for the Provision of Navigation Services in the Asia/Pacific Region** | That, the revised Strategy for the provision of navigation services provided in **Appendix J** to the Report on Agenda Item 3.4 be adopted and provided to States | Publish on website | ICAO APAC Office | Published on Website and States notified | Feb 2009 | **COMPLETED** 18/02/09.<br><br>ANC- Noted |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/32**<br><br>**D** | **Testing of Navigation and Surveillance facilities Seminar** | That, ICAO be invited to organize a seminar on 'Testing of Navigation and Surveillance facilities' in 2009 to address issues related to ground and flight inspection/validation. | Organize a Seminar | ICAO APAC Office | Seminar | Sep 2009 | |
| **D 19/33**<br><br>**D** | **Subject/Tasks List of ADS-B Study and Implementation Task Force** | That, the Subject/Tasks List for ADS-B Study and Implementation Task Force provided in **Appendix L** to the Report on Agenda Item 3.4 be adopted. | Notify ADS-B Study and Implementation Task Force | ICAO APAC Office | ADS-B S & I TF informed and paper prepared. | Apr 2009. revised May 2009 | ADS-B SITF/8 20-22 May Hanoi |
| **C 19/34**<br><br>**D** | **Guidance Materials on Implementation of ADS-B** | That, the following Guidance Materials on implementation of ADS-B Out Services be adopted for use by States in the Asia and Pacific Regions:<br><br>- Reporting Probability of ADS-B update as shown in **Appendix M;**<br><br>- Reporting ADS-B Avionics fitment as shown in **Appendix N**;<br><br>- the performance criteria for multi-sensor fusion as shown in the **Appendix O**. | Publish on website and inform States | ICAO APAC Office | Published on website and States notified | Jan 2009 | **COMPLETED** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/35**<br><br>**D** | **Guidelines for the development of ADS-B Implementation** | That, States be advised to use the following guidelines for the development of ADS-B implementation plan.<br><br>a) minimize capital and operating costs of ADS-B data facilities;<br><br>b) give priority to provide coverage over major traffic flows;<br><br>c) provide ADS-B coverage in areas within 150 NM from FIR boundaries;<br><br>d) suitable sites with power, shelter, access routes and data communication links shall be preferred; and<br><br>e) overlapping of ADS-B coverage is preferred. | Notify States | ICAO APAC Office | State Letter | Feb 2009 | **COMPLETED** |
| **C 19/36**<br><br>**D** | **Sample Agreement for ADS-B Data Sharing** | That, the sample Agreement for ADS-B Data Sharing and the cost apportionment framework provided in the **Appendices P and Q** respectively to the Report on Agenda Item 3.4 be adopted as the regional guidance material. | Notify States | ICAO APAC Office | State Letter | Feb 2009 | **COMPLETED** 14/01/09 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/37**<br><br>**D** | **Revised Mandate Regional ADS-B Out Implementation** | States intending to implement ADS-B based surveillance service, be urged to<br><br>a) determine ADS-B OUT equipage mandates based upon the ability to provide ADS-B OUT separation services;<br><br>b) expedite the implementation of ADS-B OUT in accordance with the Regional Air Navigation Plan and the provision of separation services based on ADS-B OUT;<br><br>c) publish their equipage mandates as soon as possible, with a target publication date of no later than 2010 so that operators can plan ahead their forward purchasing and retrofit;<br><br>d) choose a date after mid 2012 on which the ADS-B out equipage mandate will become effective in airspace served by<br>ADS-B ground stations with sufficient transition period to enable fleet equipage.<br><br>*Note: The implementation would require aircraft equipped with avionics compliant with either;* | Notify States<br><br>States<br><br>States | ICAO APAC Office | State Letter<br><br>publish their ADS-B OUT equipage mandate<br><br>ADS-B out equipage mandate will become effective in airspace served by ADS-B ground stations | Nov 2008<br><br>2010<br><br>After mid 2012 | **COMPLETED.**<br><br>**ANC action- Noted** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| | | 1) *Version 0 ES as specified in Annex 10, Volume IV, Chapter 3, Paragraph 3.1.2.8.6 (up to and including Amendment 82 to Annex 10) and Chapter 2 of the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260) to be used till at least 2020. or*<br><br>2) Version 1 ES as specified in Chapter 3 of the Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260A) | | | | | |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/38**<br><br>**A D** | **Support provision of VHF radio voice communication associated with ADS-B data sharing between adjacent States** | That, States be urged to consider following regional policy on supporting provision of direct controller pilot communication capability associated with ADS-B data sharing between adjacent FIRs of States.<br><br>"In order to provide radar like separation services using ADS-B, it is necessary for the controllers to have direct controller pilot communication (DCPC). In some cases, to achieve radar like separation services it may be necessary for the States to provide VHF radio voice communication services for use by adjacent States.<br><br>It is therefore recommended that States capable to do so support provision of VHF radio voice communication services to adjacent States when this is required to support the delivery of ADS-B based separation services. Cost of such service provision shall be agreed between the States concerned." | Notify States | ICAO APAC Office | State letter | Mar 2009 | **COMPLETED** |
| **C 19/39**<br><br>**D** | **Regional Surveillance Strategy for Asia/Pacific Region** | That, the revised Regional Surveillance Strategy for Asia/Pacific Region provided in the **Appendix R** to the Report on Agenda Item 3.4 be adopted. | Publish on the web site. | ICAO APAC Office | Published on website and States notified. | Jan/Feb 2009 | **COMPLETED ANC- Noted** |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/40**<br><br>**A D** | **Coordination for SSR Mode S Interrogator Identifier Code** | That,<br><br>a) in view of low density of SSR interrogator installations in the region, only Interrogator Identifier (and not Surveillance Identifiers) codes be used for SSRs Mode S in areas of overlapping coverage<br><br>b) while implementing SSR Mode S, States should take into account following issues while assigning Interrogator Identifier codes for these installations:<br><br>- for planning the implementation of SSR Mode S interrogators, administrations should ensure that the interrogators with overlapping coverage are not operating with the same Interrogator Identifier (II) codes.<br><br>- where, the coverage of the interrogator extends beyond the boundaries of the State, The II code and PRF should be worked out in coordination with the ICAO Asia and Pacific Office and the neighboring States, and | Notify States | ICAO APAC Office | State letter | Mar 2009 | **COMPLETED.** State Letter dated 24 March 09 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| | | - administrations should inform the ICAO Asia and Pacific Office about the assigned II codes and PRFs for these installations. | | | | | |
| **C 19/41**<br><br>**A D E** | **Contact Person for WRC-11 and active participation by the States in WRC-11 related national and regional activities** | That, States be urged to<br><br>a) nominate a Contact Person responsible for the preparation for WRC-11 in their administration and inform ICAO Asia and Pacific Office about the contact details of the nominated Contact Person; and<br><br>b) actively participate in all the national and regional level activities related to the preparation for WRC-11. | Notify States | ICAO APAC Office | State Letter | Jan 2009 | **COMPLETED** |
| **C 19/42**<br><br>**A D** | **Providing ASIA/PAC States with information on recent and forthcoming developments to WAFS** | That, in order to increase the regional awareness on the planned developments of the WAFS, SADIS and International Satellite Communication System (ISCS), the information provided by the WAFCs, as shown in **Appendix S** to the Report on Agenda Item 3.4 be circulated by the ICAO Regional Office to the States in the ASIA/PAC Region. | Notify States | ICAO APAC Office | State Letter | Oct 2008 | **COMPLETED**<br>T 8/4.1: AP148/08(MET) 28 Oct 2008 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/43**<br><br>**D** | **Training for the new WAFS gridded forecasts** | That, in order to facilitate the implementation by the States of the new WAFS gridded forecasts,<br><br>a) WAFC Provider States, in coordination with ICAO and WMO, be invited to organize training on the use of the new WAFS gridded forecasts for icing, turbulence and cumulonimbus clouds; and<br><br>b) WAFSOPSG be invited to consider, in addition to the planned regional training seminars, developing alternative methods for provision of training to the States on the new gridded forecasts for icing, turbulence and cumulonimbus clouds in order to ensure that a maximum number of WAFS users in the States will have access to the training in the most efficient way.<br><br>*Note: The alternative training methods include computer based training products distributed to States and web-based training.* | a) Organize training<br><br>b) Develop alternative methods for provision of training to the States on the new gridded forecasts for icing, turbulence and cumulonimbus clouds | ICAO HQ<br><br>ICAO HQ | conduct training programme<br><br>Alternative training methods | Dec 2010<br><br>Dec 2010 | Revised target date Dec 2010.<br><br>ANC action-Noted and invited the Secretary General to invite WAFC provider States in coordination with ICAO and WMO to organize the required training. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/44**<br><br>**D** | **Use of administrative messages for errors in the WAFS SIGWX forecasts** | That,<br><br>a) WAFSOPSG be requested to develop as soon as possible the procedures for the issuance of administrative messages by the WAFCs drawing attention to errors identified in the current WAFS SIGWX forecasts (in the BUFR code and PNG chart forms); and<br><br>b) ICAO be invited to develop guidance for the meteorological offices and aviation users on the use of the above administrative messages. | Prepare Issue Form<br><br>Development of procedures<br><br>develop guidance on the use of the above administrative messages. | ICAO APAC Office<br><br>ICAO HQ<br><br>ICAO HQ | Issue Form sent to HQ<br><br>The procedures for the issuance of administrative messages by the WAFCs<br><br>Guidance | Dec 2008<br><br>2010<br><br>2010 | **COMPLETED** |
| **C 19/45**<br><br>**A D** | **Transition to ISCS 3rd Generation** | That, in view of the plans by the ISCS Provider State to upgrade the ISCS broadcast to a new 3rd Generation service (ISCS 3G) by the end of 2009:<br><br>a) the ISCS Provider State be urged to provide timely information to the ISCS user States on the planned changes including specifications of the hardware and software changes, transition timeline and expected cost implications for the users if any; and | Provide specifications<br><br>Notify ISCS user States | ISCS provider State<br><br>ICAO APAC Office | Specification information available<br><br>State Letter | Mar 2009<br><br>Apr 2009 | State Letter sent T 4/8.1:AP-MET 0019/09 dated 27 Feb 2009. Response awaited. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| | | b) the ISCS user States be urged to keep abreast of the planned developments through the established channels of communication with the ISCS Provider State and plan well in advance any resources required for the transition to the ISCS 3G;<br><br>*Notes:*<br><br>*1) The ISCS Provider State will use the established network of ISCS focal points as its basis for keeping States informed.*<br><br>*2) The Secretariat will undertake the task to keep the list of ISCS focal points up-to-date to ensure efficient communication between the ISCS Provider State and the ISCS user States in the ASIA/PAC Region.*<br><br>*3) All information on the planned transition will be available on: http://www.weather.gov/iscs* | | | | | |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/46**<br><br>**D** | **Amendment proposal to TAF-related provisions in the ASIA/PAC Basic ANP and FASID (Doc 9673)** | That,<br><br>a) the amendment proposal to the ASIA/PAC Basic ANP, as presented in **Appendix V** to the Report on Agenda Item 3.4 , be processed according to the established procedure; and<br><br>b) the new format of FASID Table MET 1A, as presented in **Appendix U** to the Report on Agenda Item 3.4, be adopted and the ASIA/PAC States be invited to provide the necessary data to the Regional Office in order to issue an amendment proposal. | prepare amendment proposal<br><br>Notify States | ICAO APAC Office<br><br>ICAO APAC Office | amendment proposal to HQ<br><br>State Letter | Sep 2008<br><br>Nov 2008 | **COMPLETED** Amendment Proposal (APAC 08/29-MET:AP 123/08 (MET) 17 Sep 2008 APPROVED<br><br>**COMPLETED** Amendment Proposal (APAC 08/31 :AP133/08(MET) 1 Oct 2008 (approved) |
| **C 19/47**<br><br>**D** | **Regional preparedness for timely implementation of the new TAF provisions** | That,<br><br>a) the Regional implementation plan for the new TAF provision presented in **Appendix W** to the Report on Agenda Item 3.4 be circulated to all ASIA/PAC States; and<br><br>b) States be informed that the new TAF format should be used for all TAFs issued after 00 UTC on 5 November 2008. | Notify States<br><br>Notify States | ICAO APAC Office<br><br>ICAO APAC Office | State Letter<br><br>State Letter | Sep 2008<br><br>Sep 2008 | **COMPLETED** T 4/8.3.2: AP127/08(MET) 23 Sep 2008<br><br>**COMPLETED** T 4/8.3.2: AP129/08(MET) 29 Sep 2008 |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/48**<br><br>**D** | **Test website for the transition to the new TAF format** | That, States in the ASIA/PAC Region be invited to use the special website established by the U.S. NWS to facilitate the transition to the new TAF format and test their procedures for issuance of 30-hour TAF.<br><br>*Note: The 30-hour TAF test website is accessed on: http://www.weather.gov/os/aviation/taf_testbed.shtml* | Notify States | ICAO APAC Office | State Letter | Sep 2008 | **COMPLETED**<br>T 4/8.3.2: AP129/08(MET) 29 Sep 2008 |
| **C 19/49**<br><br>**D** | **Guidance on the period of validity of TAF included in the HF VOLMET broadcasts** | That, ICAO:<br><br>a) be invited to urgently review the concerns expressed with regard to the non-suitability of 30-hour TAF for HF VOLMET broadcasts as described in detail in the report of CNS/MET SG/12 meeting; and<br><br>b) provide urgent guidance to the States concerned taking into consideration the user requirements expressed by IATA and IFALPA, before the implementation date of the new TAF provisions. | Prepare Issue Form<br><br>review<br><br>guidance to the States | ICAO APAC Office<br><br>ICAO HQ<br><br>ICAO HQ | Issue form sent to HQ<br><br>Review<br><br>required guidance | Dec 2008 | **COMPLETED**<br>ANC- Noted<br><br>**COMPLETED**<br><br>**COMPLETED**<br>T 4/6.1.1: AP124/08(MET) |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/50**<br><br>**D** | **Issues related to TAF code** | That, ICAO, in coordination with WMO be invited to consider the following issues related to TAF:<br><br>a) providing explicit definition of the geographical area that the TAF covers with consistency between this definition for the TAF and METAR;<br><br>b) establishment of amendment criteria for the temperature group in the TAF; and<br><br>c) establishment of provision for multiple occurrences of operationally significant maximum or minimum temperatures in a 30-hour TAF. | Prepare Issue Form<br><br>Review the issues concerning TAF | ICAO APAC Office<br><br>ICAO HQ | Issue Form sent to HQ<br><br>Amendment criteria to be included in Amendment 76 to Annex 3 as necessary; and guidance | Dec 2008<br><br>2011 | **COMPLETED**<br>ANC action-supported the request and called upon the Sec Gen to address the issues in Conclusion 19/50 with the assistance of AMOFSG |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **C 19/51**<br><br>**D** | **Coordination and Implementation of the Volcanic Ash Notification for Aviation** | That States listed in FASID Table MET 3C be encouraged to implement the format VONA developed by the International Airways Volcano Watch Operations Group (IAVWOPSG) in order to:<br><br>a) improve communication of information on volcanic activity to ACC, VAAC, and MWO; and<br><br>b) provide feedback on the utility of the VONA and refinements that should be considered by the IAVWOPSG<br><br>*VONA = Volcano Observatory Notice for Aviation* | Notify States | ICAO APAC Office | State Letter | Nov 2008 | **COMPLETED**<br>T 4/9.1 : AP171/08(MET) 28 Nov 2008 |
| **C 19/52**<br><br>**D** | **Update of ASIA/PAC Regional SIGMET Guide** | That, the new SIGMET examples developed by Hong Kong, China and Australia given in **Appendix Y** to the Report on Agenda Item 3.4 be included in the new edition of the ASIA/PAC Regional SIGMET Guide. | Notify States | ICAO APAC Office | State Letter | Dec 2008 | **COMPLETED**<br>T 4/8.3.2 : AP185/08(MET) 17 Dec 2008 |

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| **C 19/53**<br><br>**D** | **Convening MET/ATM TF meeting and organizing MET/ATM seminar** | That, a meeting of MET/ATM Task Force be convened in 2009 to review and update the Work Programme of the group and prepare a programme for the second ASIA/PAC MET/ATM Seminar to be held in 2010.<br><br>*Note: Coordination with the ATM/AIS/SAR Sub-group is essential for the planned meeting of the MET/ATM TF* . | Organize meeting | ICAO APAC Office | Meeting convened | Dec 2009 | |
| **C 19/54**<br><br>**D** | **Improvements to aeronautical climatological information provision** | That, ICAO, in coordination with WMO and IATA, be invited to:<br><br>a) study the evolving user requirements for the provision of aeronautical climatological information, in view of the increasing importance of climatological data in the decision making process and strategic planning of airline operations;<br><br>b) based on the results of the study, consider developing proposal for improvements to aeronautical climatological information provision. | Prepare Issue Form<br><br>proposals for improvements to aeronautical climatological information. | ICAO APAC Office<br><br>ICAO HQ | Issue form sent to HQ<br><br>Appropriate provisions | Dec 2008<br><br>TBD | **COMPLETED**<br><br>ANC action- In view of the important scope of this issue no action should be taken until the need for the provision of improved aeronautical climatological information be assessed by a conjoint ICAO/WMO meeting |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **D 19/55**<br><br>**D** | **Updated Subject/Tasks List of the CNS/MET Sub-group** | That, the Subject/Tasks List of the CNS/MET Sub-group provided in Appendix A2 to the Report on Agenda Item 3.4 be adopted. | Notify CNS/MET SG | ICAO APAC Office | CNS/MET SG informed with paper prepared | Jul 2009 | |
| **C 19/56**<br><br>**C,D** | **Common methodology for environmental benefits** | That, ICAO be invited to establish and maintain a simple and cost effective common methodology to assess and document environmental benefits to airspace and CNS/ATM planning initiatives. | Prepare Issue Form<br><br>Common methodology | ICAO APAC Office<br><br>ICAO HQ | Issue Form sent to HQ<br><br>Appropriate guidance | Dec 2008<br><br>2010 | **COMPLETED**<br><br>ANC action- Noted that the task of developing a common methodology to assess environmental benefits of CNS/ATM systems is already included in the work program of CAEP. |

| Conclusion/ Decision No. --- Strategic Objective* | Title of Conclusion/ Decision | Text of Conclusion/Decision | Follow-up Action | To be initiated by | Deliverable | Target date | Status as on 30 March 2009 |
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| **D 19/57**<br><br>**A, C, D** | **Amendments to the Terms of Reference of the ATM/AIS/SAR SG** | That, amendments to the Terms of Reference of the ATM/AIS/SAR Sub Group be adopted to enable consideration of the Global Air Navigation Safety Plan in planning processes and ensure environmental initiatives are identified and progressed, as presented in **Appendix B** to the APANPIRG/19 Report on Agenda Item 5. | Notify ATM/AIS/SAR/ SG | ICAO APAC Office | ATM/AIS/ SAR SG informed with paper prepared | Jun 2009 | ***COMPLETED , ATM/AIS/SAR/ SG/19 informed of updated Terms of Reference*** |

*** Note:** ICAO has established the following Strategic Objectives for the period 2005-2010:
**A: Safety** - *Enhance global civil aviation safety*; **B: Security** - *Enhance global civil aviation security*; **C: Environmental Protection** - *Minimize the adverse effect of global civil aviation on the environment*; **D: Efficiency** - *Enhance the efficiency of aviation operations*; **E: Continuity** - *Maintain the continuity of aviation operations;* **F: Rule of Law** - *Strengthen law governing international civil aviation.*

**TERMS OF REFERENCE**

**AIR TRAFFIC MANAGEMENT/AERONAUTICAL INFORMATION SERVICES AND SEARCH AND RESCUE (ATM/AIS/SAR) SUB-GROUP OF APANPIRG**

1. **Ensure the continuing and coherent development of the ASIA/PAC Regional Air Navigation Plan in the ATM/AIS/SAR fields in accordance with the Global Air Navigation Plan and the Global Aviation Safety Plan;**

**2. Review and identify deficiencies that impede the implementation or provision of efficient ATM/AIS/SAR services in the Asia/Pacific region;**

**3. Monitor CNS/ATM systems research and development, trials and demonstrations in the fields of ATM/AIS/SAR and facilitate the transfer of this information and expertise between States;**

**4. Make specific recommendations aimed at improving ATM/AIS/SAR services by the use of existing procedures and facilities and/or through the evolutionary implementation of CNS/ATM systems;**

**5. Review and identify inter-regional co-ordination issues in the fields of ATM/AIS/SAR and recommend actions to address those issues; and**

**6. Ensure ATS environmental initiatives are consistently identified and progressed, and act as the Asia/Pacific regional focal point for the reporting of outcomes from ATS environmental initiatives.**

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***(Last updated APANPIRG/19, September 2008)***

# AGENDA ITEM 3: REGIONAL PERFORMANCE FRAMEWORK AND METRICS

**Agenda Item 3: Regional Performance Framework and Metrics**

**Performance Based Planning**

3.1 The meeting was informed that the ICAO planning objective is to achieve a performance based global air traffic management (ATM) system through the implementation of air navigation systems and procedures in a progressive, cost-effective and cooperative manner.

3.2 The performance-based approach to planning stems from requirements associated with the results based environment that ICAO, industry and States have been steadily moving toward. The ICAO *Global ATM Operational Concept* (Doc 9854) provides a clear statement of the expectations of the Air Traffic Management (ATM) Community. Eleven of these expectations, also referred to as key performance areas (KPAs), have been identified in the operational concept. To support this approach, the *Manual on Global Performance of the Air Navigation System* (Doc 9883) was developed. Doc 9883 provides a step by step approach to performance-based planning on the basis of the KPAs identified in the operational concept. The performance-based approach is structured upon the following principles:

a) strong focus on desired/required results through adoption of performance objectives and targets;

b) informed decision making, driven by the desired/required results; and

c) reliance on facts and data for decision making.

3.3 The advantages of a performance-based approach include:

a) results oriented, transparency and promoting accountability;

b) shift from prescribing solutions to specifying desired performance;

c) employs quantitative and qualitative methods;

d) avoids a technology driven approach;

e) helps decision makers to set priorities;

f) makes the most appropriate trade-offs; and

g) allows optimum resource allocation.

3.4 APANPIRG/19, recognising the benefits to be gained through the performance based planning process including alignment of the work programmes of the States, regions and ICAO Headquarters, adopted the following Conclusion:

***Conclusion 19 /1 — Regional performance framework***

*That, a regional performance framework be adopted on the basis of ICAO guidance material and aligned with the Global Air Navigation Plan and the Global ATM Operational Concept. The performance framework should include identification of regional performance objectives taking into consideration user expectations (to be mapped against current work) and completion of regional performance framework forms based on the sample shown in Appendix A to the report on Agenda Item 3.*

**Regional Performance Framework**

3.5 One of the key aspects of the performance based approach is the development of regional performance objectives with measurable outcomes and associated metrics. This will facilitate regional and global management and, in terms of regional performance planning, the outcome of this process would result in an output and management form that has been designated as a "Performance Framework Form (PFF)".

3.6 In developing appropriate regional performance objectives, the meeting recognised the need to take into account:

a) existing APANPIRG Key Priorities;

b) the work programme of the Sub-Group as shown in the Task List; and

c) user expectations.

**Review APANPIRG Key Priorities**

3.7 In this context, the meeting reviewed the *List of Key Priorities for the CNS/ATM Implementation in the Asia/Pacific Region* endorsed by the APANPIRG/19 meeting and agreed that relevant matters from the List should be incorporated into the regional performance objectives. This would ensure that their relative priority was highlighted but would also mean that there was no need to duplicate them on the List of Key Priorities, suggesting that the role currently played by the Key Priorities List could be entirely included in the performance objectives and the List be discontinued. A copy of the Key Priorities List has been included as **Appendix A** to the Report on Agenda Item 3.

**Review Sub-Group Task List**

3.8 A review of the ATM/AIS/SAR Task List, as adopted under Decision 19/13, was undertaken. The meeting recalled that the Task List had been comprehensively reviewed and updated by the last two Sub-Group meetings and represented the current work programme of the Sub-Group. Accordingly, the matters on the Task List were appropriate for consideration in the preparation of regional performance objectives.

**Comparison of User Expectations with Regional Work Programme**

3.9 The meeting reviewed a comparative analysis (**Appendix B** to the Report on Agenda Item 3 refers) that had been completed by the Secretariat and which sought to compare the IATA user expectations 2008-2015 against the existing work programmes throughout the region. The Secretariat highlighted that due to the size and complexity of the Asia/Pacific region and relative lack of resources at the Regional Office, in some cases the work programmes undertaken by the 'informal' ATS Coordination Groups (i.e. ISPACG, IPACG, ASIOACG, EATMCG) had been included in the analysis as they supplemented the items in work through the ICAO groups.

3.10 Although there was room for improvement in some areas, the comparative analysis demonstrated that, that with one exception, current work underway either by ICAO working groups or informal State working groups addresses the elements of the IATA ATM user expectations for 2008-15. The exception identified by the analysis was that no programme had been established that included an overall review of the Southeast Asia/Northeast Asia route structure, as had been raised in the IATA user expectations.

**Identification of Regional Performance Objectives**

3.11 The meeting noted that the Regional Airspace Safety Monitoring Advisory Group (RASMAG) had recently drafted a regional safety performance objective termed *APAC ATM 1 - Airspace Safety monitoring to achieve regional TLS*, which was supported by draft Conclusion RASMAG 11/4 adopting the safety objective.

3.12 Based on the review of APANPIRG Key Priorities, Sub-Group Task List and comparative analysis with IATA user expectations, the meeting prepared PFFs for the ATM, AIS and SAR regional performance objectives listed below:

**APAC ATM 1** (*RASMAG)* – Airspace Safety Monitoring to achieve regional TLS.

**APAC ATM 2** – Optimise Traffic Flow

**APAC ATM 3** – Optimise Route Structure in En-route Airspace

**APAC ATM 4** – Optimise Route Structure in Terminal Airspace

**APAC ATM 5** – Implementation of New ICAO Flight Plan Provisions

**APAC AIS 1** – Enhanced Provision of AIS/AIM

**APAC SAR 1** – Enhanced Search and Rescue Capability

3.13 The PFFs describing the Regional Performance Objectives above and generic explanatory notes on the PFF composition have been included as **Appendices C and D**, respectively, to the Report on Agenda Item 3. In comparing the PFFs against the Key Priorities List, the meeting considered that the ATM related aspects of Key Priorities 1 and 2 had been adequately included in APAC ATM 3 and APAC ATM 4, Key Priority 7 had been included in APAC ATM 4, Key Priority 9 had been included in APAC ATM 1 and Key Priority 10 had been included in APAC ATM 2. Accordingly, the meeting considered that any ATM-related aspects of the Key Priorities List had been sufficiently incorporated into the PFFs and could be removed from the Key Priorities List. The Secretariat would draw this outcome to the attention of the 13th meeting of the CNS/MET Sub-group (CNS/MET/SG/13) meeting in late July, along with the suggestions that the CNS and MET Priorities also be considered for inclusion in the relevant PFF and the Key Priorities List be discontinued.

3.14 The meeting endorsed the following draft Decision, which incorporates draft Conclusion RASMAG 11/4 in terms of APAC ATM 1, for consideration by APANPIRG/20:

**Draft Decision SG19/1 – Asia Pacific Regional Performance Objectives**

That, the Asia Pacific Regional Performance Objectives and associated performance framework forms as contained in Appendix B to the ATM/AIS/SAR/SG/19 Report on Agenda Item 3 be adopted in the current work programme for APANPIRG and Sub-Groups.

**Performance Measurement - Metrics**

3.15 The meeting learned that the number one principle of the Performance-Based Approach is a *strong focus on desired/required results*. The ability to reach consensus on the desired outcome of performance management, in terms of performance results to be achieved (i.e. to agree on objectives and targets), is a basic prerequisite for the successful application of the approach.

3.16 Assessment of achievements must be periodically checked through performance reviews, which in turn require adequate performance measurement and data collection capabilities. Data collection, processing, storage and reporting are fundamental to the performance-based approach. Although re-use of data prepared by others is sometimes possible, the data reporting chain generally starts from the operational workplace.

3.17 Establishing a data reporting chain usually involves participation from many ATM community members. Their willingness to participate requires the establishment of a performance data reporting culture, a capability to successfully manage disclosure and confidentiality aspects, and deciding on a case-by-case basis which approach works best: mandatory or voluntary reporting. Harmonization and standardization of reporting requirements is needed to allow consistent interpretation of data across different reporting sources. This in turn is a prerequisite for meaningful benchmarking (comparison of reporting sources) and aggregation of data (calculation of totals across reporting sources).

3.18 In order to ensure that appropriate data was available to enable the measurement of suitable regional metrics, the meeting agreed to the following Draft Conclusion:

**Draft Conclusion SG19/2 − Data Collection for Regional Metrics**

That Regional Office coordinate with States, organizations and stakeholders in the region to collect and process data to support the regional metrics adopted by APANPIRG, leveraging to the extent possible all existing data and ongoing efforts, and provide a progress report to APANPIRG/21.

3.19 The meeting recognised that, ideally, regional metrics would include capabilities for the measurement of environmental outcomes as well as the safety and efficiency enhancements. However, it was unclear to the meeting what types of data could be readily collected by States for submission to the Regional Office. It was also evident that care should be taken to ensure the metrics selected could be readily used, thereby providing a benefit rather than serving as an onerous and burdensome additional task that would draw further on limited resources in many States. In considering aspects of the Global ATM Operational Concept and the Manual on Performance of the Global Air Navigation System, the meeting agreed to some initial regional metrics and prepared the draft Conclusion below, which incorporates RASMAG 11/5 in terms of the safety metric:

**Draft Conclusion SG19/3 − APAC Regional Metrics**

That the following metrics be adopted as air navigation system performance indicators for the Asia and Pacific region:

**APAC Safety-1:** Percentage of RMA sub-regions meeting the regional Target Level of Safety (TLS) for RVSM operations, referenced as of end April each year.

**APAC Efficiency-1:** Percentage of instrument runway ends with an approach procedure with vertical guidance (APV), (BARO-VNAV and/or augmented GNSS) either as the primary approach or as a back-up for precision approaches.

**APAC Efficiency-2:** Percentage of enroute and terminal PBN routes implemented on a sub-regional basis in accordance with the regional PBN plan.

**APAC Efficiency–3:** Average delay for departures at State's primary international airports for the busiest hour on a weekly basis.

## KEY PRIORITIES FOR CNS/ATM IMPLEMENTATION IN THE ASIA/PACIFIC REGION

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| 1. | Performance Based Navigation (RNP/RNAV) Implementation<br><br>GNSS Implementation<br>• GBAS<br>• SBAS | Implement performance based navigation, operation and procedures to improve the efficiency and flexible use of airspace.<br><br>To implement GNSS in accordance with the Asia Pacific Regional Strategy<br><br>Facilitate market available GBAS ground system (CAT I) certified to Annex 10 SARPs | Report to APANPIRG<br><br>On-going<br><br>2008 | ATM/AIS/SAR<br>CNS/MET<br><br>CNS/MET | On-going<br>Phased implementation.<br><br>SBAS Receivers – (TSO C145/6) now available<br><br>Lead aircraft with certified GBAS avionics now in service | Reflect performance based navigation, not just RNP.<br><br>Strategy for Approach, Landing and Departure identified GBAS as a preferred CAT I option. No ground equipment is available that is certified to Annex 10 SARPs |
| 2. | ADS-C | The implementation of ADS-C in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM. | Report to APANPIRG<br><br>FIT-BOB reconvened September 2003. Bay of Bengal operational trial of ADS/CPDLC commenced February 2004, trial on going.<br><br>FIT-SEA inaugural meeting May 2004. South China Sea operational trial of ADS/CPDLC expected 2006/2007. | ATM/AIS/SAR | Phased implementation.<br><br>Implementation focus and timetable need to be developed.<br><br>States are gaining experience in the use of ADS-C. | |

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| 3. | Co-operation in Regional CNS/ATM Planning, Implementation & Training. | The continuation and enhancement of ICAO's co-ordinating role of technical co-operation in CNS/ATM planning and implementation, in close co-operation with all partners and taking into account the regional approach, is required. | Report to APANPIRG | All | Sub-Groups to identify requirements. | Emphasis needs to be on sharing information and training. Title 'Technical Co-operation" is confusing with assistance programs.<br>Need to inform States of opportunities for training well in advance of scheduled date.<br>Training opportunities should include ICAO programs as well as associated organizations programs.<br>ATN Seminar was conducted.<br><br>Two ADS-B Seminars were conducted<br><br>QMS Seminar<br>SAIDS-2G<br>MET/ATM Coordination<br>Seminars were conducted<br><br>PBN Seminar were conducted |

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| ~~4.~~ | Preparation for WRC-2011 | The co-operative participation of States is required with their respective telecommunications regulatory authorities, regional groups, at the APT forums and at the WRC regional preparatory meetings for WRC-2011 to ensure that aviation spectrum requirements are fulfilled and protected. | WRC-2011 | All | States are designating contact points responsible for preparation for WRC 2011 and are providing contact details for posting on the website to facilitate coordination. | High importance task. Spectrum must be available to enable CNS/ATM implementation.<br><br>States to nominate the focal point of contact |
| 5. | MET support for the new CNS/ATM System. | To identify new MET products supporting ATM | 2010 | CNS/MET | Survey conducted, paper presented at CNS/MET SG/12, future studies needed | MET/ATM coordination meeting in 2009 and seminar in 2010 to seek guidance from ATM to MET requirements |
| | | Implementation of new gridded WAFS icing, turbulence, and cumulonimbus products | 2013 | | | Analysis of 2 models being conducted in effort to harmonize before WAFC work shop in 3rd quarter 2009 |

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| 6. | ADS-B | Airline aircraft certificated to participate in ADS-B operations. | 2009 | ADS-B SI Task Force | Lead aircraft certified for initial ADS-B OUT operation | Roll-out of ADS-B considered an on-going activity. |
| | | Develop sub-regional implementation plan: SEA etc. | 2009 | ADS-B SI Task Force | Sample agreement for data sharing has been developed and initial implementation plan has been developed | Further develop and finalize the plan. |
| 7. | Implementation of APV | Review applicability of APV and aircraft certification. | 2006 | CNS/MET | APV standards now in PANS OPS. | Completed |
| | | Develop implementation strategy. | 2007 | ATM/AIS/SAR | Aircraft certified APV approaches. | ATM/AIS/SAR/SG to consider operational issues including charting. |

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| 8. | Data Link Flight Information Services (DFIS) applications | To implement the following applications via request/response mode of data link in the Asia and Pacific Regions:<br><br>a) Data link –automatic terminal information services (D-ATIS);<br><br>b) VOLMET data link service (D-VOLMET);<br><br>c) Pre-Departure Clearance (PDC) delivery via data-link;<br><br>d) DCL | 2008 | ATM/AIS/SAR CNS/MET | Trials and demonstrations are conducted and some operational services are provided by States. | Implementation of D-ATIS is progressing<br><br>Expected to be implemented at all locations except one by 2008<br><br>PDC implemented at several locations |
| 9. | Safety Management Systems. | States to establish national safety management systems and effective application of safety programmes which are required for the provision of air traffic services.<br><br>Required monitoring services available to support operational enhancements. | | ATM/AIS/SAR RASMAG<br><br>RASMAG | Annex 11 provisions effective 27 November 2003.<br><br>On-going RASMAG activities.<br><br>Operational enhancements suspended where effective monitoring is not available. | |

| No. | KEY PRIORITIES | DESCRIPTION | MILESTONES | SUB-GROUP | STATUS | DISCUSSION/ACTION |
|---|---|---|---|---|---|---|
| 10. | Air Traffic Flow Management. | States to consider and implement aspects of air traffic flow management (ATFM) including:<br><br>a) centralized ATFM<br>b) inter-regional cooperative ATFM;<br>c) establishment of ATFM databases;<br>d) application of strategic ATFM planning; and<br>e) application of tactical ATFM planning | 2006 | ATM/ ATIS/ SAR | On going | |
| 11 | Aeronautical Fixed Services (AFS) | Facilitate deployment of ATN/OSI and ATN/IPS applications including AIDC and AMHS | 2011 | **CNS/MET** | Deployment of routers in progress, some States will implement dual stack routers (TCP/IP and OSI). Backbone Boundary Intermediate System (BBIS) sites will deploy dual stack routers. | Some States are delaying implementation until TCP/IP connectivity is available.<br><br>ATNICG is working with States to coordinate implementation and provide technical assistance as required |

**Comparison of Asia/Pacific (ASIA/PAC) Region Homogeneous ATM areas and major traffic flows/routing areas in Doc 9750 Global Air Navigation Plan and primary traffic flows in the IATA ATM User Expectations 2008-2015, as presented in WP15 to APANPIRG/19 (September 2008)**

| | | | | | |
|---|---|---|---|---|---|
| AR1 | Asia/Australia and Africa | Bangkok, Chennai, Colombo, Jakarta, Kuala Lumpur, Malé, Melbourne, Mumbai, Singapore, Yangon [and African FIR/UIRs] | Oceanic low density | Major traffic flow AFI/ASIA/MID | Not included by IATA |
| AR2 | Asia (Indonesia north to China, Japan and the Republic of Korea), Australia/New Zealand | Auckland, Bangkok, Beijing, Brisbane, Fukuoka, Guangzhou, Hanoi, Ho-Chi-Minh, Hong Kong, Honiara, Incheon, Jakarta, Kota Kinabulu, Kuala Lumpur, Manila, Melbourne, Nadi, Nauru, Oakland, Phnom-Penh, Port Moresby, Shanghai, Singapore, Taibei, Ujung Pandang, Vientiane, Wuhan, Yangon | Oceanic high density | Major traffic flow ASIA/PAC | IATA 2 Australia/SEA (Oceanic region) |
| AR3 | Asia and Europe via north of the Himalayas | Almaty, Bangkok, Beijing, Fukuoka, Guangzhou, Hanoi, Ho-Chi-Minh, Hong Kong, Incheon, Kathmandu, Kunming, Lanzhou, Phnom-Penh, Pyongyang, Shanghai, Shenyang, Taibei, Ulaanbaatar, Urumqi, Vientiane, Wuhan, Yangon [and Russian Federation FIRs, and European FIRs] | Continental high density/continental low density | Major traffic flow ASIA/EUR/MID | IATA 4 ASIA/ME/EUR (continental region) |
| AR4 | Asia and Europe via south of the Himalayas | Bangkok, Colombo, Delhi, Dhaka, Hanoi, Ho-Chi-Minh, Hong Kong, Jakarta, Karachi, Kathmandu, Kota Kinabulu, Kolkata, Kuala Lumpur, Kunming, Lahore, Chennai, Manila, Mumbai, Phnom-Penh, Singapore, Ujung Pandang, Vientiane, Yangon [and Middle East/European FIR/UIRs] | Continental high density/oceanic high density | Major traffic flow ASIA/EUR/MID | IATA 5 ASIA/ME/EUR (continental region) |
| AR5 | Asia and North America via the Russian Far East and the Polar Tracks via the Arctic Ocean and Siberia | Anchorage, Beijing, Canadian FIRs, Fukuoka, Guangzhou, Hong Kong, Incheon, Pyongyang, Russian Far East of 80E, Shanghai, Shenyang, Wuhan and Ulaanbaatar | Continental low density/continental high density | Major traffic flow ASIA/EUR/NAM/ NAT | IATA 4 ASIA/ME/EUR (continental region) |
| AR6 | Asia and North America (including Hawaii) via the Central and North Pacific | Anchorage, Fukuoka, Hong Kong and Manila, Oakland (at and north of a line drawn by LAX-HNL-Guam-MNL), Taibei, Vancouver | Oceanic low density | Major traffic flow ASIA/NAM/PAC | IATA 3 Pacific Routes (Oceanic region) |
| AR7 | New Zealand/Australia and South America | Auckland, Brisbane, Nadi, Tahiti [and South America FIR/UIRs] | Oceanic low density | Major traffic flow ASIA/PAC/SAM | Not included by IATA |
| AR8 | Australia/New Zealand, the South Pacific Islands and North America | Auckland, Brisbane and Port Moresby, Honiara, Nadi, Nauru, Oakland (southern region), Tahiti | Oceanic low density | Major traffic flow ASIA/NAM/PAC | Not included by IATA |
| AR9 | South-East Asia and China, Republic of Korea, and Japan | Bangkok, Beijing, Fukuoka, Guangzhou, Hanoi, Ho-Chi-Minh, Hong Kong, Jakarta, Kota Kinabulu, Kuala Lumpur, Kunming, Manila,Phnom-Penh, Pyongyang, Shanghai, Shenyang, Singapore, Incheon, Taibei, Ujung Pandang, Vientiane, Wuhan, Yangon | Oceanic high density | Major traffic flow ASIA | IATA 1 NEA/SEA Flow **(**continental region**)** |

| IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|
| **Terminal** | |
| RNAV 1 | Arrival and departure. RNAV 1 in radar environment and with adequate navigation infrastructure. Basic-RNP 1 in non-radar environment. (APAC PBN Implementation Plan) |
| SSR or ADS-B (or MLAT) | APAC ANP and APANPIRG Regional Surveillance Strategy,, AIGD and MLAT concept of use |
| VHF and CPDLC | APANPIRG Regional AMS strategy. In terminal area for datalink application should focus on DFIS. |
| Continuous Descent Arrivals | State responsibility<br>(APANPIRG/19 Conc 19/28 Refers) |
| Traffic Flow management | State responsibility, |
| **Remote Continental and Oceanic** | |
| RNP 4 30/30 | RNP – 4 preferred, RNAV 10 acceptable (APAC PBN Implementation Plan) |
| ADS-C<br>CPDLC | APANPIRG Regional AMS Strategy |
| **Capacity** | |
| End to end consideration of flow with choke point identification | ATFMTF for BOB<br>Continue harmonized RVSM Implementation (DPRK, Mongolia)<br>More RNP10 and RNP4 routes to be implemented per<br>APAC PBN plan;<br>ATFMTF for BOB<br>Also, relevant outcomes and recommendations from October 2008 ICAO ATFM Workshop for consideration by ATM/AIS/SAR/SG |
| Strategic plan to manage capacity | |
| ATFM or Strategic Optimised Scheduling | |

| IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|
| **Route Continental** | |
| RNAV 2 | RNAV - 2, RNAV – 5 (APAC PBN Implementation Plan) |
| SSR or ADS-B (or MLAT) | APANPIRG Regional Surveillance Strategy/MLAT concept of use |
| VHF and CPDLC | APANPIRG Regional AMS strategy |
| Traffic Flow Management | State responsibility<br>ATFMTF for BOB<br>outcomes and recommendations from October 2008 ATFM Workshop for consideration by ATM/AIS/SAR/SG |
| **Airports** | |
| Infrastructure capable supporting planned increases in movements | State responsibility |
| Synergy between airport design/ development and airspace | State responsibility |

**IATA Key Work Area 1 – NEA/SEA Traffic Flow**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | NEA/ SEA FLOW<br><br>Improving traffic flow and ATM efficiency through airport and route capacity enhancement (including reduced longitudinal separation), route realignments and flow management measures if necessary.<br>• The traffic flow between the Pearl River Delta/ Mainland China airports and airports in Taipei, Japan and Korea. Airports concerned are those in Hong Kong, Guangzhou, Shenzhen, Taipei, Fukuoka, Osaka, Tokyo, Inchon.<br><br>• The overflying traffic between South East Asian airports and the above airports. Airports concerned are in: Jakarta, Singapore, Kuala Lumpur, and Bangkok.<br><br>The overflying traffic from South East Asian airports, Pearl River Delta, mainland China, Taipei, Japan and Korea and airports in North America | Paper to 45th DGCA describes efforts by Hong Kong, Macau and mainland China to address PRD over near term<br><br>SEACG has responsibilities, some route proposals and large scale weather deviations in work with WPAC/SCS RSG<br><br>Paper to 45th DGCA re PRD. Japan progressing proposal for East Asia ATFM Centre. East Asia ATM Coordination group run by Japan is active |
| 2009 | Commence a review of the SEA/ NEA Route Structure<br><br>Analyse traffic flow and identify choke points<br><br>Initiate action to establish a Core team/Task Force comprising ICAO, affected states, IATA & CANSO<br><br>Complete detailed design of the revised route structure in synergy with airport and terminal airspace design<br><br>Implement RNP10 on all SCS routes | RNP SEA Task Force implemented RNP10 on L642 & M771 in July 2008, work continues |
| 2011 | Commence application of RNP 4 30 long on selected SCS routes<br><br>Implement route enhancements identified during analysis | RNP SEA Task Force ToR currently indicates a phase-by-phase approach, beginning with the 50 lateral/50 longitudinal separations based on RNP 10 operations on RNAV routes L642 and M771 as Phase 1 – implemented July 2008.<br><br>RNP 4 being considered for L642 7 M771 |
| 2013 | Implement New Route Structure | |

**IATA Key Work Area 2 – ADS-B (OUT) AUSTRALIA/SEA**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 2 ADS-B (OUT) - AUSTRALIA/SEA (in accordance with IATA policy)<br>• Expansion of surveillance capability based on traffic flows<br>• Regional agreement on sharing of data<br>• Reduction in separation minima | Australia is heavily committed to ADS-B, already using operationally in some airspace to apply ICAO approved 'radar like' separations, more areas to come in near term.<br><br>ADS-B Study and Implementation Task Force and SEA Working Group are progressing these issues<br><br>Sample agreement on sharing of data APANPIRG 19/36 |
| 2009 | Implement ADS-B OUT (at least on a trial basis) in the:<br>• Singapore FIR<br>• Ho Chi Minh FIR<br>(contingent on traffic data from data analysis Dec 2008. The trial will ensure data integrity for operational use) | Southeast Asia Sub-Regional ADS-B Implementation Working Group developing implementation plan |
| 2011 | Application of reduced separations<br>Singapore<br>Ho Chi Minh<br>Manila FIR (trial)<br>Kota Kinabalu FIR (trial)<br><br>UPRs<br>Thailand<br>Indonesia<br>Malaysia<br>Singapore | See above<br><br>UPRs more difficult to accommodate in heavily trafficked areas – USA has returned to fixed routes between west coast and Hawaii as more efficient that UPRs, ADS-B surveillance will help UPRs but more suitable for 'radar like' separation. |
| 2013 | Application of reduced separation Kuala Lumpar | Bay of Bengal is working towards RNP10 in 2009/2010 timeframe. This will reduce separation in KL FIR to 50NM longitudinal |

**IATA Key Work Area 3 – PACIFIC ROUTES**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 3 PACIFIC ROUTES<br>Central and North Pacific including Russian Trans-East to/ from Asia. | |
| | • Consistent application of RNP10 50/50 | 50/50 already fairly widespread, from first quarter 2009 50 NM on R591 and G344 between Anchorage and Fukuoka with procedures similar to current 50 NM seamless operation between Fukuoka and Oakland. |
| | • Improvement of ATM infrastructure (including automation allowing CPAR and AIDC) | Oakland already operating ATOP, Anchorage will ATOP shortly, USA and Japan already working towards AIDC ver 2 implement first quarter 2009 |
| | • Planned migration to RNP4 30/30 | Japan and USA trialing widespread 30/30, APANPIRG encouraging RNP4 equipage for Pacific fleets to realize benefits from 30/30 separation |
| | • UPRs / DARPs | UPR trials between Japan and Hawaii since August 2008, with opportunity to DARP while en-route. Reduction in constraints on the Pacific Organized Track System (PACOTS) in discussion |
| | Review and enhance current operations | IPACG meets twice yearly, very active work programme |
| 2009 | Complete a review of the Pacific/ Russian Trans East current operations (2008) | Cross Polar Trans-East ATM Providers Working Group (CPWG), TRASAS |
| | Identify regulatory changes to support flexible routing | USA has long term experience with DARPS and UPRs in this area, Japan participating with UPR/DARPS to Hawaii |
| | UPR – OAK, ANC, FUK, YVR (Bny to Bny) | |
| | RNP4 – ANC | PBN Regional Plan specifies RNP 4 preferred, RNAV – 10 is acceptable |
| | DARPS – OAK (Bny to Bny) | USA has long term experience with DARPS and UPRs in this area |
| | Initiate UPR trial with Manila and Taipei | |
| 2011 | UPR – Manila, Taipei, East Malaysia | |
| | RNP 4 – FUK | PBN Regional Plan specifies RNP 4 preferred, RNAV – 10 is acceptable |
| | DARPS – FUK, ANC | State responsibility USA has long term experience with DARPS and UPRs Japan participating with UPR/DARPS to Hawaii |

**IATA Key Work Area 4 – ASIA/ME/EUR North of the Himalayas**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 4 ASIA / ME / EUR<br>NORTH OF THE HIMALAYAS INCLUDING POLAR INTERFACE (INTO & TRANSITTING CHINA) | |
| | • New routes implementation to release the congestion in PRD region | Paper to 45th DGCA describes efforts by Hong Kong, Macau and mainland China to address PRD over near term |
| | • PRD TMA realignment | Paper to 45th DGCA describes efforts by Hong Kong, Macau and mainland China to address PRD over near term |
| | • China Flexible entry/exit points serving cross polar, EUR-CHN and CHN-ME (should also include other Asian and NAM flights) | In work with CMRI, CPWG, TRASAS |
| | • Joint use of restricted area in China | GPI-1 State responsibility |
| | • RVSM implementation in Mongolia, Russia, CIS states, DPR Korea and Polar | RVSM - DPRK in July 2009 with assistance from China, Mongolia in 2011 in company with Russian Federation |
| | • Implementation of identified routes structure in China | State responsibility |
| | • RNP2 parallel route structure in China | State responsibility, based on regional and national PBN plans |
| 2009 | Review airspace, route structure and ATM procedures within China, Mongolia, Russia, CIS States and DPRK including use of restricted airspace (2008) | Perhaps under TRASAS, CPWG, CMRI |
| | Extension of existing Polar route interface (flexible entry and exits points) into other areas of China (including supporting routes within) based on user requirements. This includes the allowance for flexible entry and exit points based on tactical flight planning requirements (on a flight by flight basis) | State responsibility, assistance from<br>Cross Polar Trans-East ATM Providers Working Group (CPWG), CMRI and TRASAS |
| | Increased operational civil access to restricted areas in China. | State responsibility |
| | New routes implementation to release the congestion in PRD region | Paper to 45th DGCA describes efforts by Hong Kong, Macau and mainland China to address PRD over near term |

| | | |
|---|---|---|
| 2011 | RVSM implementation in Mongolia, Russia, CIS states, DPR Korea and Polar region | State responsibility,<br>RVSM - DPRK in 2009 with assistance from China, Mongolia in 2011 in company with Russian Federation |
| 2013 | Parallel Route Implementation between major cities in China by PBN applications. | State responsibility, using national PBN Plan |
| 2015 | PRD TMA realignment, Civil-Military Joint ATC, Imperial system<br><br>Implementation in Southern Sector of PRD TMA<br><br>Implementation of identified routes in China | State responsibility<br><br>Paper to 45th DGCA describes efforts by Hong Kong, Macau and mainland China to address PRD over near term<br><br>State responsibility |

**IATA Key Work Area 5 – ASIA/ME/EUR South of the Himalayas**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 5 ASIA / ME / EUR<br>SOUTH OF THE HIMALAYAS (NOT INCLUDING CHINA) | |
| | • Consistent application of RNP10 50/50 | Regional PBN Plan. Bay of Bengal is working towards RNP10 in 2009/2010 timeframe |
| | • Planned migration to RNP 4 30/30 | Regional PBN Plan |
| | • UPRs / DARPs | In work with ASIOACG |
| | • Increased Route structure in Kabul FIR | UL333 and B466 opened August 2008. |
| | • Entry/ exit IND-PAK | A number of route changes imitated by ATFM/TF are in work in Pakistan, will include interface with India |
| | • ATM infrastructure | Relevant outcomes and recommendations from October 2008 ICAO ATFM Workshop for consideration by ATM/AIS/SAR/SG |
| | • Strategic plan to manage capacity including review of requirements for ATFM | |
| | • Joint use of restricted airspace | GPI -1 Flexible use of Airspace |
| | • AIS | AAITF |
| 2009 | Review airspace, route structure and ATM procedures within India, Pakistan, Afghanistan, Sri Lanka and Myanmar including use of restricted airspace (2008) | |
| | RNAV 5 enroute on Delhi-Mumbai sector | PBN Regional Plan specifies RNAV 5. State responsibility |
| | ATFM BOM/ DEL FIRs | State responsibility |
| 2011 | RNP 10 Oceanic Routes | PBN Regional Plan specifies RNP 4 preferred, RNAV – 10 is acceptable |
| | UPR Southern Oceanic of BOB/ AS and IO | In work with ASIOACG |
| | ATFM all major traffic flows within India (not including overflights) | State responsibility |
| 2013 | RNP4 30/30 | PBN Regional Plan has RNP 2 for 2013 – 2016 as preferred, RNP – 4 is acceptable |

**IATA Key Work Area 6 – PBN**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 6 PBN<br>• Implementation of ICAO, APAC and State plan<br>• All PBN implementation in accordance with ICAO PBN Manual | |
| 2009 | Develop ICAO State PBN plan – PBN Task Force<br><br>Develop ICAO Regional PBN Plan (2008)<br><br>RNAV SIDS/STARS – Indonesia IATA/ICAO initiative (Jun 2008)<br><br>Complete CNS ASPAC Fleet capability survey to support PBN implementation (2008)<br><br>Priority/ expedite work areas<br>- Jakarta<br>- Medan<br>- Denpasar<br>- Surabaya<br><br>Identify how to address critical staffing shortages for the expeditious implementation of PBN | PBN Task Force established<br><br>APAC PBN Implementation Plan adopted by APANPIRG/19<br><br>State responsibility<br><br>IATA<br><br>State responsibility<br><br>ICAO has established a Procedures Design Programme to address designer shortfall. |
| 2011 | Implementation as per ICAO state and regional plan | APAC PBN Implementation Plan adopted by APANPIRG/19 |
| 2013 | Implementation as per ICAO state and regional plan | APAC PBN Implementation Plan adopted by APANPIRG/19 |
| 2015 | Implementation as per ICAO state and regional plan | APAC PBN Implementation Plan adopted by APANPIRG/19 and to address RCP for the implementation |

**IATA Key Work Area 7 – Airports**

| | IATA ATM user expectations 2008-2015 | Regional Activity |
|---|---|---|
| | 7 Airports<br>Ensure synergy of development between airport capacity/expansion and ATS<br><br>Includes<br>• Runways and Manoeuvring Areas<br>• CTRs<br>• TMAs<br>• Arrival and Departure Procedures<br><br>Airport capacity will be dependent on strategic plan to manage regional capacity | State responsibility |
| 2009 | Review airports against user requirements identifying priorities<br><br>Commence implementation of Airport plan in synergy with ATS requirements and in conjunction with work undertaken within Key Areas 1-6 | State responsibility<br><br>State responsibility |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

| **REGIONAL PERFORMANCE OBJECTIVE: APAC – ATM 1**<br><br>**AIRSPACE SAFETY MONITORING TO ACHIEVE REGIONAL TLS** | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Safety** | • Improved safety management,<br>• Compliance with regional Target Level of Safety (TLS) | | | |
| ***Strategy***<br>**Short term/medium term (2009-2015)** | | | | |
| **ATM OC COMPONENTS** | **TASKS** | **TIME FRAME** | **RESPONSIBILITY** | **STATUS** |
| **AOM**<br>*(Airspace Organization and Management)* | • Facilitate cooperative arrangements between States to undertake airspace safety assessments<br><br>• Review airspace safety monitoring that supports reduction in vertical and horizontal aircraft separation standards | 2009-2015 | RASMAG | In progress |
| | • Assist States to achieve established regional Target Levels of Safety (TLS)<br><br>• Provide advice to States to establish aspects of ATS safety management systems that support compliance with the regional TLS | 2009-2015 | RASMAG<br><br>SEA RR/TF<br>BOB RHS/TF<br>PBN/TF | In progress |
| **GPIs** | GPI/2 Reduced vertical separation minima, GPI/5 Performance based navigation, GPI/7 Dynamic and Flexible ATS route management | | | |
| **References** | • *Asia/Pacific Guidance Material for ADS/CPDLC/AIDC Ground Systems Procurement and Implementation;*<br>• *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region*<br>• *Asia/Pacific En-route Monitoring Agency (EMA) Handbook*<br>• *Regional Monitoring Agency (RMA) Manual*<br>• *Global Operational Data Link Document (GOLD).* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

**REGIONAL PERFORMANCE OBJECTIVE: APAC – ATM 2**

## OPTIMISE TRAFFIC FLOWS

| **Benefits** | |
|---|---|
| **Environment** | • reductions in fuel consumption |
| **Efficiency** | • reduction in weather and traffic induced holding<br>• improved and smoother traffic flows<br>• improved predictability<br>• optimized demand and capacity balancing through the efficient exchange of information |

***Strategy***
**Short term (2009-2010)**
***Medium term (2011–2015)***

| **ATM OC COMPONENTS** | **TASKS** | **TIME FRAME** | **RESPONSIBILITY** | **STATUS** |
|---|---|---|---|---|
| **DCB** *(Demand and capacity management)* | **Bay of Bengal**<br>• Enhance and facilitate the orderly flow of traffic across the Bay of Bengal and south Asia | 2009-2010 | Air Traffic Flow Management Task Force (ATFM/TF) | Implemented and reviewed regularly by the Bay of Bengal ATFM/TF<br><br>ATM/AIS/SAR/SG/19 drafted Conclusion to establish regional ATFM steering group |
| **DCB** *(Demand and capacity management)* | **South China Sea**<br>• Enhance and facilitate the orderly flow of traffic in the South China Sea area | 2011-2015 | SEACG | ATM/AIS/SAR/SG/19 drafted Conclusion to establish regional ATFM steering group |
| **DCB** *(Demand and capacity management)* | **Northeast Asia/Southeast Asia**<br>• Enhance and facilitate the orderly flow between Northeast Asia and Southeast Asia, as well as within and between the North and the South Pacific regions | 2009/2015 | IPACG, ISPACG, EATMCG<br><br>SEA RR/TF (ATS routes) | ATM/AIS/SAR/SG/19 drafted Conclusion to establish regional ATFM steering group |
| **GPIs** | GPI/6 air traffic flow management, GPI/7 Dynamic and Flexible ATS route management, GPI/8 Collaborative airspace design and development, GPI/16 Decision support and alerting system | | | |
| **References** | • *Draft Air Traffic Flow Management Communications Handbook for the Asia/Pacific Region*<br>*APANPIRG Conclusions XX, YY and ZZ* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

**REGIONAL PERFORMANCE OBJECTIVE: APAC – ATM 3**

## OPTIMISE ROUTE STRUCTURE IN ENROUTE AIRSPACE

| **Benefits** | |
|---|---|
| **Environment** | • reductions in fuel consumption |
| **Efficiency** | • increase airspace capacity<br>• ability of aircraft to conduct flights more closely to preferred trajectories<br>• facilitate utilization of advanced technologies thereby increasing efficiency<br>• optimized demand and capacity balancing through the efficient exchange of information |
| **Safety** | • enhance safety by use of modern capabilities onboard aircraft |

***Strategy***
**Short term (2010)**
***Medium term (2011 - 2015)***

| ATM OC COMPONENTS | TASKS | TIME FRAME | RESPONSIBILITY | STATUS |
|---|---|---|---|---|
| **AOM** *(Airspace Organization and Management)* | • Implement ATS route enhancements in the Asia Pacific Region, in collaboration with stakeholders, based on new technologies and procedures and in accordance with APANPIRG PBN Regional Plan, to improve en-route airspace efficiency.<br><br>• Identify ATS and aeronautical communications problems in the Asia Pacific Region including Indian Ocean and the Arabian Sea, and prepare coordinated plans for actions for their resolution. | 2009 -2015 | **Bay of Bengal and Arabian Sea**<br>BBACG,<br>FIT-BOB,<br>Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF)<br><br>(Informal Arabian Sea/Indian Ocean ATS Coordination Group - ASIOACG) | Target for 50NM longitudinal separation in Bay of Bengal is 2010 |
| | | 2009-2015 | **Southeast Asia AR9 Flow**<br>SEACG,<br>FIT-SEA<br>Southeast Asia Route Review Task Force (SEA RR/TF) | ATM/AIS/SAR/SG/19 established the SEA Route Review Task Force (SEA RR/TF) |

| | | | | |
|---|---|---|---|---|
| | | 2009-2015 | **<u>Pacific Area</u>**<br>No APANPIRG regional working group established<br><br>(Informal<br>• South Pacific ATS Coordination Group – ISPACG,<br>• Pacific ATS Coordinating Group – IPACG, and<br>• East Asia ATM Coordination Group EATMG) | 50 NM longitudinal implemented North Pacific in 2008<br><br>30/30 NM (RNP4) implemented Honiara, Nauru, Brisbane, Nadia Auckland Oceanic FIRs in January 2005<br><br>30/30 NM Operational trial Oakland FIR commenced 2007, Fukuoka FIR from August 2008, Anchorage FIR estimated 2011 |
| **AOM**<br>*(Airspace Organization and Management* | **Cross-Polar routes**<br>• Improve alignment and use of cross polar routes at their south (Asian) ends. | 2010-2015 | Special ATS coordination meeting – China, Mongolia, Russian Federation, IATA (CMRI)<br><br>Informal Cross Polar Working Group (CPWG) | In progress |
| **GPIs** | GPI/5 Performance based navigation, GPI/8 Collaborative airspace design and management | | | |
| **References** | • *Asia/Pacific Regional Performance Based Navigation Implementation Plan*<br>• *ICAO Performance Based Navigation Manual (Doc 9613)* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

**REGIONAL PERFORMANCE OBJECTIVE: APAC – ATM 4**

## OPTIMISE ROUTE STRUCTURE IN TERMINAL AIRSPACE

| **Benefits** | |
|---|---|
| **Environment** | • reductions in fuel consumption |
| **Efficiency** | • increase airspace capacity<br>• ability of aircraft to conduct flights more closely to preferred trajectories<br>• facilitate utilization of advanced technologies thereby increasing efficiency<br>• optimized demand and capacity balancing through the efficient exchange of information |
| **Safety** | • enhance safety by use of modern capabilities onboard aircraft |

***Strategy***
**Short term (2010)**
***Medium term (2011 - 2015)***

| ATM OC COMPONENTS | TASKS | TIME FRAME | RESPONSIBILITY | STATUS |
|---|---|---|---|---|
| **AOM** *(Airspace Organization and Management)*<br><br>**AUO** *(Airspace Users Operations)* | Implement ICAO Performance Based Navigation (PBN) provisions for terminal area operations in collaboration with stakeholders based on the Regional PBN Implementation Plan agreed by APANPIRG, to improve terminal area efficiency by use of advanced navigation specifications for SIDs, STARs and instrument approach procedures. | In accordance with PBN Regional Plan | Performance Based Navigation Task Force (PBN/TF) | PBN/TF prepared Regional PBN Plan adopted by APANPIRG/19 |
| **GPIs** | GPI/5 Performance based navigation, GPI/8 Collaborative airspace design and management. GPI/10 Terminal area design and management, GPI/11 GPI-11 RNP and RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs), GPI-12 Flight Management System (FMS) – based arrival procedures | | | |
| **References** | • *Asia/Pacific Regional Performance Based Navigation Implementation Plan*<br>• *ICAO Performance Based Navigation Manual (Doc 9613)* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

**REGIONAL PERFORMANCE OBJECTIVE: ATM – 5**

## IMPLEMENTATION OF NEW ICAO FLIGHT PLAN PROVISIONS

| **Benefits** | |
|---|---|
| **Environment** | • reductions in fuel consumption and gaseous emissions as a result of efficiency gains. |
| **Safety** | • enhance safety by use of modern capabilities onboard aircraft |
| **Continuity** | • maintains continuity of aviation operations across the region |
| **Efficiency** | • ability of air navigation service providers to make maximum use of aircraft capabilities,<br>• ability of aircraft to conduct flights more closely to their preferred trajectories,<br>• facilitate utilization of advanced technologies thereby increasing efficiency, and<br>• optimized demand and capacity balancing through the efficient exchange of information. |

***Strategy***
**Short/Medium Term (2009-2012)**

| **ATM OC COMPONENTS** | **TASKS** | **TIME FRAME** | **RESPONSIBILITY** | **STATUS** |
|---|---|---|---|---|
| **SDM** *(ATM Service Delivery Management)* | • Implement the provisions of Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444), comprising amended PANS ATM Chapter 4, Chapter 11, Appendix 2 and Appendix 3 provisions relating to the ICAO Flight Plan and associated ATS Message formats, with applicability date 15 November 2012. | 2009-2012 | ICAO Flight Plan and ATS Messages Task Force (FPL&AM/TF) | ATM/AIS/SAR/ SG/19 recommended that APANPIRG adopt the *Interim Strategy for the Implementation of New ICAO Flight Plan Format and supporting ATS Messages* prepared by FPL&AM TF/1 |
| **GPIs** | GPI/5: Performance based navigation, GPI/9: Situational awareness, GPI/11: RNP and RNAV SIDs & STARs, GPI/17: Implementation of data link applications and GPI/18: Aeronautical Information | | | |
| **References** | • *Amendment 1 to 15th Edition of PANS-ATM (Doc 4444, ICAO State Letter Ref: AN13/2.1-08/50, dated 25 June 2008)*<br>• *ICAO Guidance Material for Implementation (ICAO State Letter Ref: AN 13/2/1-09/9, dated 6 February 2009)*<br>• *Asia/Pacific Region – Interim strategy for the implementation of new ICAO flight plan format and supporting ATS messages*<br>• *APANPIRG Decision 19/6* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

| **REGIONAL PERFORMANCE OBJECTIVE: AIS – 1**<br><br>**ENHANCED PROVISION OF AIS/AIM** | | | | |
|---|---|---|---|---|
| **Benefits** | | | | |
| **Efficiency** | • enhanced collaboration between flight crew and the ATM system,<br>• improved collaborative decision making,<br>• improved predictability, and<br>• reduction of workload for aircrew and ATC. | | | |
| ***Strategy***<br>**Short to Medium term (2009 – 2012)** | | | | |
| **ATM OC COMPONENTS** | **TASKS** | **TIME FRAME** | **RESPONSIBILITY** | **STATUS** |
| **SDM**<br>*(ATM Service Delivery Management)* | • Implement the enhanced provisions for AIM becoming available through the work of the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG);<br><br>• Monitor implementation progress | 2009-2016 | AAITF | In progress |
| **GPIs** | GPI/18: Aeronautical Information | | | |
| **References** | • *Annex 4 – Aeronautical Charts*<br>• *Annex 15 – Aeronautical Information Services*<br>• *AIS Manual (Doc 8126)*<br>• *Aeronautical Chart Manual (Doc 8697)*<br>• *EUROCONTROL Operating Procedures for AIS Dynamic Data (OPADD)* | | | |

**ASIA/PACIFIC REGION**

# PERFORMANCE FRAMEWORK FORM
**(REGIONAL)**

**REGIONAL PERFORMANCE OBJECTIVE: SAR – 1**

## ENHANCED SEARCH AND RESCUE CAPABILITY

| **Benefits** | |
|---|---|
| **Safety & Efficiency** | • cost-efficient use of RCC accommodation and equipment on a shared basis,<br>• development of a pool of experienced SAR mission coordinators skilled across both aviation and maritime domains thus reducing coordination and fragmentation,<br>• proficient services provided near and within States with limited resources,<br>• harmonization of aviation / maritime procedures, and<br>• inter-operability of life-saving equipment |

***Strategy***
**Short to Medium term (2009 – 2015)**

| **ATM OC COMPONENTS** | **TASKS** | **TIME FRAME** | **RESPONSIBILITY** | **STATUS** |
|---|---|---|---|---|
| **IM** *(Information Management)* | Implementation of Annex 12 Standards and Recommended Practices and related APANPIRG Conclusions to ensure appropriate SAR capabilities for the Asia/Pacific regions. | | | |
| | • Periodic review of SAR facilities, services and procedures in the region; | 2009-2015 | States, ATM/AIS/SAR Sub Group | In progress |
| | • Encourage States to delegate or negotiate SAR services in accordance with Annex 12 provisions; | 2009-2015 | States, ATM/AIS/SAR Sub Group | In progress |
| | • APANPIRG Asia/Pacific "SAR Capability Matrix" and "Register of SAR Agreements" be kept up to date and distributed to States for information and action; | 2009 - 2015 | States, ATM/AIS/SAR Sub Group | In progress |
| | • States designate an agency for registering ELT Beacons, coded with the country code of the State and unique code of that beacon in a database as required by Annex 10. | 2010 | States | In progress |
| **GPIs** | None applicable | | | |
| **References** | • *Annex 12 – Search and Rescue*<br>• *International Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual, Doc 9731)*<br>• *APANPIRG Conclusions 18/19 & 18/20* | | | |

## PERFORMANCE FRAMEWORK FORM - EXPLANATORY NOTES

1. **Performance framework form:** This form is an output and management form which is applicable to both regional and national planning and includes references to the Global Plan. Other formats may be appropriate but should contain as a minimum the elements described below:

2. **Performance objective:** Regional /national performance objectives should be developed using a performance based approach that best reflects the necessary activities needed to support regional/national ATM systems. During their life cycle, performance objectives may change depending on the ATM system's evolution; therefore, throughout the implementation process, these should be coordinated with and be available to all interested parties within the ATM Community. The establishment of collaborative decision making processes ensures that all stakeholders are involved in and concur with the requirements, tasks and timelines.

3. **Regional performance objective:** Regional performance objectives are the improvements required to the air navigation system in support of the global performance objectives, and are related to the operating environments and priorities applicable at the regional level.

4**.** **National performance objective:** National performance objectives are the improvements required to the air navigation system in support of the regional performance objectives, and are related to the operating environments and priorities applicable at the State level.

5**.** **Benefits:** The regional/national performance objectives should meet the expectations of the ATM community as described in the operational concept and should lead to benefits for stakeholders and be achieved through operational and technical activities aligned with each performance objective.

6. **Strategy:** ATM evolution requires a clearly defined progressive strategy including tasks and activities which best represent the national and regional planning processes in accordance with the global planning framework. The goal is to achieve a harmonized implementation process evolving toward a seamless global ATM system. For this reason, it is necessary to develop short (1 to 5 years) and medium term (6 to 10 years) work programmes, focusing on improvements to the system indicating a clear work commitment for the parties involved.

7. **ATM operational concept components;** Each strategy or set of tasks should be linked with associated components of the ATM operational concept. The designators for ATM components are as follows:

- AOM – Airspace organization and management
- DCB – Demand and capacity management
- AO – Aerodrome operations
- TS – Traffic synchronization
- CM – Conflict management
- AUO – Airspace user operations
- ATM SDM – ATM service delivery management

8. **Tasks:** The regional/ national work programmes, using this PFF template, should define tasks in order to achieve the said performance objective and at the same time maintain a direct relation with ATM system components. The following principles should be considered when developing work programme:

- The work should be organized using project management techniques and performance-based objectives in alignment with the strategic objectives of ICAO.

- All tasks involved in meeting the performance objectives should be developed using strategies, concepts, action plans and roadmaps which can be shared among parties with the fundamental objective of achieving seamlessness through interoperability and harmonization.

- The planning of tasks should include optimizing human resources as well as encouraging dynamic use of electronic communication between parties such as the Internet, videoconferences, teleconferences, e-mail, telephone and facsimile. Additionally, resources should be efficiently used, avoiding any duplication or unnecessary work.

- The work process and methods should ensure that performance objectives can be measured against timelines and the national and regional progress achieved can be easily reported to PIRGs and ICAO Headquarters respectively.

9. **Timeframe:** Indicates start and end time period of that particular task(s).

**10. Responsibility: Indicates the organization/entity/person accountable for the execution or management of the related tasks.**

11**. Status:** The status is mainly focused on monitoring the progress of the implementation of that task(s) as it progresses toward the completion date.

12**. Linkage to global plan initiatives (GPIs)*:*** The 23 GPIs, as described in the Global Plan, provide a global strategic framework for planning for air navigation systems and are designed to contribute to achieving the regional/national performance objectives. Each performance objective should be mapped to the corresponding GPIs. The goal is to ensure that the evolutionary work process at the State and regional levels will be integrated into the global planning framework.

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# AGENDA ITEM 4: REVIEW AND PROGRESS THE TASKS ASSIGNED TO THE ATM/AIS/SAR/SG BY APANPIRG

**Agenda Item 4: Review and progress the tasks assigned to the ATM/AIS/SAR/SG by APANPIRG**

**Review of RVSM Task Force Meeting**

4.1 The meeting noted that the 34th meeting of RVSM Implementation Task Force (RVSM/TF/34, December 2008) was held in Beijing, China with the objective of conducting the one year post-implementation review of China RVSM.

4.2 It was reported to the RVSM/TF/34 meeting by the China Regional Monitoring Agency (RMA) that estimates of both technical and overall risks were found to satisfy the agreed target level of safety (TLS) value of no more than $2.5\times10^{-9}$ and $5.0\times10^{-9}$ fatal accidents per flight hour due to the loss of a correctly established vertical separation standard and to all causes, respectively. Of note were the values for technical and operational risks which were comparatively smaller than those obtained in the pre-implementation safety assessment, indicating that both technical and total risks had decreased after the implementation of RVSM.

4.3 The China RMA had started the research of the feasibility and the solution of using ground-based height monitoring due to the necessity of long-term monitoring and the wide coverage of geographical area, and also to achieve a higher level of height monitoring in RVSM airspace.

4.4 With the successful conclusion of the implementation of RVSM in China, it was agreed that the RVSM Task Force had carried out all the Terms of Reference assigned to it by APANPIRG and that the Task Force was dissolved at the end of RVSM/TF/34 in accordance with APANPIRG Conclusion 19/5. The Chairman congratulated the RVSM Task Force on its successful conclusion of its task.

4.5 In this respect, the Secretariat drew attention to the note that had been included by APANPIRG in Conclusion 19/5:

> ***Note:*** *In dissolving the RVSM/TF, APANPIRG places on the record its highest commendation and appreciation to all parties associated with the RVSM/TF for the continuous implementation of RVSM and the very positive and quantifiable beneficial effects on safety, efficiency and the environment that have resulted directly from the work of the RVSM/TF.*

4.6 RVSM implementation will take place in the Pyongyang FIR in October 2009 with direct assistance from China and the Regional Office, and implementation in the Ulaan Baatar FIR is tentatively scheduled for 2012. A representative from DPR Korea confirmed the implementation date of RVSM in Pyongyang FIR as AIRAC 22 October 2009.

**Western Pacific/South China RVSM Scrutiny Group**

4.7 The Sixth Meeting of the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG/6) was held from 7 to 9 April 2009, to conduct the one year post implementation review of the revised flight level arrangements that had been implemented in the Western Pacific and South China Sea areas on 2 July 2008. This was a complex and widespread implementation that had affected a large number of different parties serving the 10 or so FIRs in this area. Outcomes from the ongoing work programme to reduce the number and duration of LHDs were also reviewed.

4.8 The meeting recalled that the Seventeenth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/17, August 2006) recognized that there

were three very significant safety matters outstanding in relation to WPAC/SCS operations that needed to be urgently addressed:

1) the TLS for WPAC/SCS RVSM operations being exceeded;

2) concerns about the modified single alternate flight level orientation scheme; and

3) no updated horizontal safety assessment had been undertaken for the SCS.

4.9 It was noted that large height deviation (LHD) occurrences were reducing in frequency and duration, leading to the vertical TLS being satisfied and this positive trend in the risk assessment was attributed directly to the interventions made by States in identifying and treating the numbers and duration of LHDs. The meeting recognized that the relatively high numbers of LHDs attributable to errors in ATC Unit-to-ATC Unit coordination were still driving the risk estimate and needed to be corrected.

4.10 It was highlighted that a LHD should always be considered as one type of a breakdown of ATS coordination incident and therefore should be addressed under normal ATS Safety Management System (SMS) processes in accordance with Annex 11 – *Air Traffic Services*. Investigations of LHD should be conducted in the same way as investigations into other ATS incidents, with causal factors identified and remediations put in place.

4.11 The WPAC/SCS RSG had also agreed to update the Large Scale Weather Deviation (LSWD) procedures, as shown in **Appendix A** to the Report on Agenda Item 4, and LSWD implementation arrangements including NOTAMs had now been addressed by the SEACG.

4.12 In overall terms, it was apparent to the meeting that the specific TOR established for the WPAC/SCS RSG by APANPIRG to address urgent safety matters in the WPAC/SCS airspace had been substantially met and the RSG could therefore be considered for dissolution. The RSG meeting agreed that the residual work items on the task list of the RSG –pertaining mainly to ATS route proposals − could be adequately handled by SEACG under their existing mandate. Further assistance was available from RASMAG and the ATM/AIS/SAR Sub-Group if necessary. Accordingly, the meeting agreed to the following Draft Decision for consideration by APANPIRG:

**Draft Decision SG19/4 − Dissolution of Western Pacific/South China Sea RVSM Scrutiny Working Group**

That, having substantially completed the Terms of Reference established by APANPIRG,

a) the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG) be commended for the swift and effective outcomes in satisfactorily addressing RVSM safety performance in the WPAC/SCS area, and

b) the WPAC/SCS RSG be dissolved and any residual work items be allocated to the Southeast Asia ATS Coordination Group (SEACG) and/or the Regional Airspace Safety Monitoring Advisory Group (RASMAG) and ATM/AIS/SAR Sub-Group as necessary.

4.13 Although IATA congratulated the WPAC/SCS RSG on the outcomes that had been achieved and were sorry to see such an effective group being dissolved, they expressed concern that some of the residual work could fall outside of the areas of responsibility of other groups such as SEACG and a situation could eventuate where a particular work item was not being addressed. The meeting noted these concerns.

4.14 The meeting commended the excellent outcomes that had been achieved by the participants of the WPAC/SCS RSG. In respect to the major concerns that had originally led APANPIRG to establish the WPAC/SCS RSG, the implementation of the revised flight level arrangements in July 2008 had resulted in greater harmonisation with the flight level arrangements in airspaces surrounding the WPAC/SCS area. Strategies implemented by States for the management of LHDs were having a significant beneficial effect which had resulted in very positive trends in safety performance that were expected to ensure the regional TLS continued to be met for the foreseeable future. Horizontal safety monitoring was now routinely undertaken by the Southeast Asia Safety Monitoring Agency (SEASMA) operated by the Civil Aviation Authority of Singapore.

**First Meeting of ICAO Flight Plan and ATS Messages Task Force**

4.15 It was noted that APANPIRG/19 (September 2008) was of the view that that a full and comprehensive assessment of the implications of the transition to the new flight plan and ATS messages formats described in Amendment 1 to the 15th Edition of the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) was absolutely necessary. In order to ensure that the matter would be appropriately addressed on a regional basis, APANPIRG/19 adopted the Decision 19/6 establishing a regional Task Force and drafted preliminary terms of reference (TOR) accordingly.

4.16 The First Meeting of Asia/Pacific ICAO Flight Plan & ATS Messages Implementation Task Force (FPL&AM TF/1) was held from 17 - 20 March 2009 at the Regional Office. The meeting prepared a suitable performance framework form (PFF), which was reviewed and updated by the Sub-Group meeting as discussed in Agenda Item 3. The PFF would be periodically reviewed by the Task Force to ensure that it continued to accurately reflect the work programme of the FPL&AM/TF.

4.17 The meeting recalled that the TOR established by APANPIRG required that the Task Force, amongst other things, *"….prepare and promulgate Asia/Pacific implementation strategies and plans…."* Accordingly, the meeting reviewed the *Interim Strategy for the Implementation of New ICAO Flight Plan Format and supporting ATS Messages* that had been prepared by the FPL&AM/TF, retained as **Appendix B** to the Report on Agenda Item 4.

4.18 FPL&AM TF/1 recognized that there were a number of limitations on the strategy. This was the first meeting of the Task Force. Only very limited work had commenced in States, so the Task Force had effectively no information on Amendment 1 implementation activities from States to refer to. And the Task Force had identified that a number of clarifications to Amendment 1 were necessary and had sought clarification from ICAO HQ.

4.19 Clearly, as more information became available, amendments to the Strategy would become necessary. However, the Interim Strategy provided valuable information to States and users about the way that the Asia/Pacific Region intended to proceed with implementation. The Strategy would be updated by future meetings of the Task Force to incorporate the latest information available. In the meantime there was a pressing need to increase awareness amongst States about the complexities involved and encourage them to commence work on implementation.

4.20 The Sub-Group discussed the complexities inherent in properly coordinating a global implementation. In this context, concern was expressed about the ability and authority of the Asia/ Pacific Task Force to undertake coordination outside the Asia/Pacific region, a situation further complicated because APANPIRG has jurisdiction within the Asia/Pacific, not outside. The web site that was to be established by ICAO HQ would be useful, particularly in listing the status of FIRs, however the meeting understood that this would not be a dynamic mechanism for agreeing to regional differences/timings etc in implementation. The Sub-Group was not aware of the progress in other regions or whether task forces had been established and reached the view that a robust global coordination mechanism would be very beneficial in ensuring success in this implementation.

4.21 In considering the Interim Strategy document IATA questioned the concept of a transition period. From the airline perspective there has to be a single date from which the new format will be used. It was clarified that from the service provider's point of view the transition period is a period of trial and testing before the new format can be implemented and the old format discarded. Hong Kong, China agreed that there should be a period for testing but queried whether it should be as long. Confusion may arise from operation of different ANSPs at different stages of readiness.

4.22 IATA further clarified the use of the word 'transition'. In the context of the TF report it was used consistent with the Head Office guidance. But there was another transition required in that at the time of the implementation of the new format there will be thousands of aircraft airborne which will not have the ability to switch to the new format in flight.

4.23 Hong Kong, China pointed out the contradiction in the Interim Strategy where it acknowledges that there will be States not implementing the full provisions of Amendment 1 but then goes on to say that all States and airspace users accept and disseminate 'NEW' flight plan and associated ATS message formats only and capabilities for 'PRESENT' flight plan provisions are discontinued after 15 November 2012. The Secretariat agreed that there was a contradiction, but the reality exists that some States will not be ready to implement and the Chicago Convention allows the filing of differences with ICAO. Nevertheless, the FPL&AM/TF would persist with requiring all States to implement, in clear preference to the filing of a difference. The Sub-Group urged the FPL&AM TF to look into the operational and system impacts in relation to the post implementation situation.

4.24 Hong Kong, China queried the ability to file flight plans up to five days in advance noting that airlines traditionally file three hours before departure. The Secretariat noted that the new provisions were global in nature and referred to the response from Head Office in that early submission of flight plan information by airspace users is necessary to allow collaborative decision making in some of the high density global airspace. It was further clarified that the 5 days in advance was an option, rather than a mandatory provision.

4.25 Following significant discussion the meeting adopted the following draft Conclusion

**Draft Conclusion SG19/5 − Adopt Interim Strategy for Implementation of New Flight Plan Format**

That the '*Strategy for the implementation of new ICAO Flight Plan Format and supporting ATS Messages*' provided in Appendix B to the ATM/AIS/SAR/SG/19 Report on Agenda item 4 be adopted and published as the interim edition, and States and users be urged to commence implementation planning based on the interim Strategy.

4.26 In order to ensure that States gave early consideration to the Flight Plan implementation and provided suitable information to the FPL&AM TF on which to base coordination and implementation planning, the meeting also adopted an additional draft Conclusion:

**Draft Conclusion SG19/6 − Notification of State Transition Date to New Flight Plan Format**

That, in order to align regional implementation planning, States inform the Regional Office by 1 July 2010 of their scheduled date and implementation methodology for transition to the new Flight Plan and ATS Message formats.

4.27 The FPL&AM/TF 1 meeting had conducted a comprehensive review of the PANS ATM amendment relating to the new flight plan and identified a number of matters which were relayed to ICAO headquarters for clarification. The clarifications received from ICAO HQ are included as **Appendix C** to the Report on Agenda Item 4 and will be subject to further discussion during the next FPL&AM/TF meeting.

4.28 In order to provide the maximum information to regional airspace and systems planners, the meeting agreed that a one day Seminar would be beneficial in educating States about some of the many issues involved. The meeting agreed that the next meeting of the Task Force would be held over 3 days, immediately following the one day Flight Plan Implementation Seminar. The dates selected were Tuesday 10 November 2009 for the Seminar, and Wednesday to Friday, 11-13 November 2009 for the Task Force meeting. Both events would be held at the Regional Office premises in Bangkok, Thailand. The seminar initiative was welcomed by the Sub-Group and States and Organizations were urged to attend.

**Satellite Data Communications Performance in Oceanic and Remote Regions**

4.29 The United States provided information on satellite data communications service provision and data link performance problems that have impacted service delivery. Outages and inconsistent performance in satellite data link service have reduced confidence in end-to-end service. The meeting recalled that concerns in this regard had led to APANPIRG Conclusion 19/24 calling for a meeting to be held to discuss the impact of these issues on Asia/Pacific operations.

4.30 At the Fifth FANS SATCOM Improvements Team meeting (FSIT/5, 20-21 November 2008) formed by INMARSAT, the following determinations were made by the group:

a) the activities to *investigate, identify, and propose solutions* are essentially complete;

b) ‘supplier contribution’ changes have been completed, giving improvements to performance;

c) suppliers view the changes to meet the 30/30 NM operational requirements as beyond the original system design requirements, so further change is required;

d) costings for ‘30/30‘ solution generated to extent possible by all stakeholders; and

e) some mechanism of funding from the *users* or others will be required to pay for upgrades from the *supplier*.

4.31 On behalf of the FSIT, INMARSAT is assembling costs for the identified changes to 13 ground networks, avionics changes and Airbus and Boeing to recertify the networks. The total cost is estimated to be 15-20 million USD. Output of this would ideally be Free of Charge Service Bulletin (endorsed by Airbus and Boeing) to update avionics and updated ground infrastructure (e.g., enhanced monitoring, enhanced load testing, full backup between Ground Earth Stations (GESs) in ocean region). FSIT/5 concluded that a funding mechanism for upgrades to change elements to achieve required communication performance (RCP) target for 30/30 is necessary before 30/30 operations can move into an implementation phase. FSIT/6 is scheduled to convene in August 2009.

**Asia/Pacific Fans Data Link Events**

*FANS Data Link Seminar*

4.32 In the Asia/Pacific region, implementation of data link is facilitated by a number of FANS Implementation/Interoperability Teams (FITs) for respective sub-regional areas. In particular, progress towards data link implementations in the Bay of Bengal area has accelerated recently and the Boeing Company will provide data link Central Reporting Agency (CRA) services for the Bay of Bengal FIT with effect from September 2008.

4.33 In order to educate data link newcomers, both ANSPs and Operators, a two data FANS data link seminar will be conducted at the Asia and Pacific Regional Office from 24-25 August 2009. Participation at both events is invited.

*Satellite Data Link Operational Continuity meeting (SOCM)*

4.34 Immediately following the data link Seminar, the SOCM from 26-28 August 2009 will review the performance and provision of satellite data link communications in the Asia/Pacific region. The SOCM arises from discussions during APANPIRG/19 (September 2008) which resulted in Conclusion 19/24 calling for such a meeting.

**Global Operational Data Link Document (GOLD)**

4.35 The United States provided an update to the status of the global operational data link document (GOLD). The APANPIRG, the NAT Systems Planning Group (SPG) and others have recognized a need to globally harmonize data link operations and, to the greatest extent possible, resolve regional and/or State differences impacting seamless operations; APANPIRG adopted Conclusion 19/9 recognizing this work.

4.36 At recent meetings of regional formal and informal ATS Coordination groups and FANS Interoperability/Implementation Teams (FITs), the ICAO Bangkok office and the FAA have presented papers on the GOLD. These papers provided background information, terms of reference, and the work program for the Ad Hoc Working Group which is producing the GOLD. The Ad Hoc Working Group is proceeding to complete the sections of the document and ensuring complete coverage of the FANS 1/A Operations Manual (FOM) and the North Atlantic Guidance Material on Data Link Applications (NAT GM). In addition, further work is needed to reorganize the document, simplify text, ensure consistency in style, and streamline the document.

4.37 The GOLD Ad Hoc Working Group is planning to distribute a circulation copy of the GOLD for a broad review July through September and, following the review, to complete the final draft of the GOLD this year. The Working Group has commenced coordination with ICAO regional offices to determine the tasks necessary for the APANPIRG and NAT SPG to endorse the GOLD at their September 2009 and June 2010 meetings, respectively.

4.38 The meeting was provided with a copy of the present internal working draft of the GOLD (Version 0.4.3, comprising about 290 pages) for review following the meeting and was invited to support the GOLD Points of Contact in compiling comments for final distribution of the GOLD. Feedback in relation to the GOLD was requested to be provided to the Regional Office for compilation and relay to the Working Group before 14 August 2009.

**Aeronautical Information Service (AIS) Matters**

**First Meeting of ICAO AIS-AIM Study Group (AIS-AIMSG/1)**

4.39 The meeting noted that the first meeting of ICAO AIS-AIM Study Group (AIS-AIMSG/1, December 2008) was held at ICAO Headquarters in Montréal, Canada.

AIS to AIM Transition

4.40 AIS-AIMSG/1 developed a draft roadmap for the transition from AIS to AIM. It was noted that the transition roadmap approved by the ANC had been published on the ICAO public website in English. Aerodrome Mapping Data Base (AMDB) provisions are to be related to electronic Terrain and Obstacle Data (eTOD) with consequent changes to Annexes 4, 14 and 15.

4.41 Aerodrome Mapping Data Base (AMDB) provisions are to be related to the electronic Terrain and Obstacle Data (eTOD) provisions with consequent changes to Annexes 4 *Aeronautical Charts*, 14 – *Aerodromes* and 15 – *Aeronautical Information Services*. The requirement (Amendment 33 to Annex 15) for States to provide terrain and obstacle data is causing some difficulties and may cause delays to the introduction of eTOD with considerable financial implications. Other proposed Annex amendments were noted.

4.42 It was noted that guidance material was in preparation for aeronautical information exchange model (AIXM), electronic Aeronautical Information Publication (eAIP) and AIS quality. The inclusion of the World Meteorological Organization (WMO) to ensure a harmonized and consistent development of key mutual components of AIS and MET data models was welcomed.

**Fourth Meeting of the AIS-AIM Implementation Task Force (AAITF/4, February 2009)**

4.43 The meeting noted that the fourth meeting of the AIS-AIM Implementation Task Force (AAITF/4, February 2009) was held in Narita, Japan. It was noted that the Task Force reviewed the AIS-AIM transition issues, roadmap and annex changes. Terrain and Obstacle Data applicability date for Areas 2 and 3 would be extended to 15 November 2012 (proposed Annex 15, paragraph 10.6.1.2 refers). Additionally, as the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is based on Annex 15 specifications for the Areas 2 and 3 eTOD, a consequential amendment is proposed to Annex 4, paragraph 5.2.1.

4.44 The meeting understood that Eurocontrol issued a report on the 2008 NOTAM trial in December 2008. The report contains an overview of the trial, some technical and statistical information and concluding remarks. The full report, together with other presentations, is available to all registered on the Eurocontrol website.

4.45 While the need for the harmonization in the application of AIRAC effective date and time was understood, it was recorded that the AAITF/4 meeting was unable to agree to a rigid specific time to suit States concerned.

4.46 IFATCA asked whether the extended period planned for the transition from AIS to AIM could cause problems**.** The Secretariat responded that the issues in AIS-AIM were very complex and could not be concluded early. Having said that, it was conceded that Australia or Japan would convey the hope that the final transition period should not be overlong.

**AIS Automation/Electronic Terrain and Obstacle Data Seminar/Workshop**

4.47 The meeting noted that the second meeting of the AIS Implementation Task Force (AITF/2, February 2007) undertook a thorough review of the comprehensive AIS survey that had been conducted as a result of APANPIRG Conclusion 17/16, noting that many States in the Region had not implemented AIS system improvements as required by ICAO, especially in the field of computerization and automation. APANPIRG 18 (September 2007) considered ways to assist these States to improve their AIS capability and formulated *Conclusion 18/12 – Assistance to States to improve AIS capability*. APANPIRG/18 (September 2007) also recognized that there were difficulties in implementing electronic Terrain and Obstacle (eTOD) from November 2008 as required by Annex 15 – *Aeronautical Information Services*. Based on the review of the information, the meeting adopted *Conclusion 18/15 – Strategies to implement eTOD.*

4.48 ICAO AIS Automation/eTOD Seminar/Workshop, graciously hosted by Japan Civil Aviation Bureau (JCAB), Ministry of Land, Infrastructure, Transport and Tourism was held in Narita, Japan on 23 and 24 February 2009 in conjunction with the fourth meeting of AIS-AIM Implementation Task Force (AAITF/4). The AIS Automation/eTOD Seminar/Workshop was attended as many as by 160 participants from Australia, Bangladesh, China, Hong Kong China, Fiji, Indonesia, Japan, Malaysia, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Viet Nam, Eurocontrol, IFALPA and Jeppesen.

4.49 The AIS Seminar/Workshop recommended that both short- and long-term assistance be provided to States, and the seminar/workshop concluded as follows:

a) Within the Asia and Pacific Region, there is a varying degree of implementation status and readiness for the existing Annex 15, Chapter 10 eTOD Standards and Recommended Practices (SARPs).

b) Significant cost and institutional issues prevail as impediments to global eTOD implementation.

c) Asia and Pacific Region is reliant upon greater clarification being provided by ICAO revision of Annex 15 currently being considered by ICAO AIS-AIM Study Group together with the associated guidance documents.

4.50 In considering the next steps for eTOD in the Asia/Pacific Region, the meeting supported the three conclusions of the Seminar/Workshop. Subsequent to detailed discussions, the meeting formulated the following Conclusion:

**Draft Conclusion SG19/7 – Assistance to States to implement eTOD**

That, in light of the fact that:

a) within the Asia and Pacific Region, there is a varying degree of implementation status and readiness for the existing Annex 15, Chapter 10 eTOD Standards and Recommended Practices (SARPs);

b) significant cost and institutional issues prevail as impediments to global eTOD implementation; and

c) Asia and Pacific Region is reliant upon greater clarification being provided by ICAO revision of Annex 15 currently being considered by ICAO AIS-AIM Study Group together with the associated guidance documents,

ICAO consider providing short- and long-term assistance to States in order to build their capacity to provide eTOD in a sustainable and cost efficient manner.

*Note: An appropriate form of providing assistance could include establishment of an ICAO technical cooperation project with funding sought from donor agencies.*

**Study of Application of AIRAC Date/Time in Asia Pacific Region**

4.51 The meeting discussed a paper presented by Australia on the difference in interpretation and application of AIRAC time in Asia/Pacific Region. In the most extreme example, it results in two neighbouring States implementing AIRAC changes 24 hours apart. While a single AIRAC Date/Time for the region would be the ideal solution this was not achievable.

4.52 In discussion on the paper, IATA asked what effect there would be on FMS databases if the proposed solution was adopted. It was pointed out that the problem already exists and that up to 24 hours difference between adjacent States was the current situation. The proposal would reduce this difference and would be helpful to operators. Japan supported this and recommended the proposal.

4.53 The meeting recognized that changing the AIS Manual would not change the reality of different AIRAC date/times, this problem would be ongoing. New Zealand stated that in their view the most important element of the proposal was the publishing of the routine State AIRAC date/time in AIP GEN. After significant discussion, the meeting could not support the suggested amendment and urged the States involved to continue consultation to seek a solution.

**Activities towards AIM in Japan**

4.54 Japan informed the meeting that their AIS Center (AISC), which was established in April 2007 as the sole integrated AIS unit in Japan, started its operation on 1 July 2007. AISC provides all of AIS related products under quality management system following ISO 9001:2008 and advances the project step by step to achieve AIM.

4.55 By using a new AIS database system, the AISC started provision of Graphic NOTAM on 27 August 2008, which can provide graphic information about the closure or the restrictions on runways, taxiways and spots in 18 major airports in Japan. Graphic NOTAM is described in Scalable Vector Graphic (SVG), and available on AIS JAPAN website (https://aisjapan.mlit.go.jp) with SVG viewer. At the same time NOTAM is provided in the form of XML to JCAB internal systems.

4.56 AISC determined to provide electronic AIP (eAIP) on AIS JAPAN website and DVD from 27 August 2009. The eAIP is generated from static data (SD), which is based on AIXM4.5 and managed in the new database. This eAIP is available in the form of HTML and PDF.

4.57 In addition, AISC is planning to provide SD in the form of AIXM-XML and exchange with European AIS database (EAD) within 2009 FY. At first, SD exchange will be carried out by uploading and downloading the data through the Internet file system between EAD and CNS/ATM (AIS) database. However, it is recognized that Eurocontrol and JCAB continue to cooperate and find out the best interface of online connection to enable timely exchange with each other.

4.58 As the next step, AISC has started system design to upgrade the database to AIXM5 in order to provide electronic terrain and obstacle data (eTOD) and electronic charts from 2011. At this stage, eAIP will be fully available in the form of XML to users, when their system connects to the database directly. All of the charts will be created in Geographic Mark up Language (GML) using Geographic Information System (GIS) technology and provided in the form of XML, though the current charts are in PDF form.

4.59 In parallel with AIXM upgrading, JCAB plans to make a research for xNOTAM (digital NOTAM) in 2009 with regard to its details and system requirements necessary for implementation.

**Multiple Series NOTAMS – Implementation in United States**

4.60 The United States presented information providing an outline of what the Federal Aviation Administration is planning regarding the implementation of multiple series usage for United States issued International NOTAMs. This change is necessary as an interim step towards the United States NOTAM System (USNS) becoming ICAO-compliant and meeting the future needs of digital aeronautical information exchange.

4.61 The current NOTAM system that is in use in the United States typically has 11,000 to 16,000 active NOTAMs, exceeded the maximum NOTAM number, 9999, on many occasions. A first phase transition to Series A and K NOTAMs will be followed by a complete ICAO formatted NOTAM according to Annex 15 with the addition of multiple (up to 18) series to cover appropriate topics.

4.62 The overall objective is to assist the United States to achieve digital NOTAM implementation and ICAO formatted NOTAMs. The foundations of this effort are based on AIXM Version 5, industry requirements from RTCA/EUROCAE Sub-Group 206, digital NOTAM trials both in EUROCONTROL and the FAA, and policy based on AIM Operating Procedures and ICAO Annex 15.

**Search and Rescue (SAR) Matters**

**SAR Agreements and SAR Matrix**

4.63 The meeting reviewed and updated the APANPIRG list of SAR Agreements and the SAR Capability Matrix Table as presented in **Appendices D and E** to the Report on Agenda Item 4, respectively. It was noted that the SAR Matrix had been updated as required by APANPIRG 19/11 and included detailed guidance on completion of the Matrix. The meeting thanked the United States for their work in this regard.

4.64 Cambodia provided a detailed update on recent enhancements its SAR capabilities and undertook to advise the Secretariat in writing of the changes in time for presentation to the

September APANPIRG meeting. Vietnam advised of the recent update to the SAR agreement with Lao PDR and Cambodia, and would also provide details in writing to the Regional Office. India had issued regulations regarding the carriage of ELTs and would provide confirmation to the Regional Office to allow appropriate update of the Matrix.

4.65 The meeting noted the successful outcomes of the HK CAD 2008 international SAREX during October 2008 and the supporting ICAO SAR Seminar. No SAREX activities were planned during 2009 by States present at the meeting; however Hong Kong China expressed their intention to conduct an international SAREX during 2010.

**Recent SAR Incidents**

4.66 In highlighting to the meeting that aircraft emergencies regrettably do occur, the United States referred to two incidents in 2009 as examples for the need of search and rescue (SAR) services. The first incident was a passenger aircraft in the United States which successfully ditched after losing all engine power due to bird strikes. The plane remained intact and floated long enough for all passengers and crew to successfully evacuate.

4.67 The second incident was the ongoing effort regarding a passenger aircraft flying over the Atlantic Ocean from Brazil to France. This incident demonstrated the value of close cooperation between governments, the need for close coordination between aeronautical and maritime SAR services, and the usefulness of merchant vessels (to observe the distress, conduct searches, and recover people and objects) as discussed in Chapter 4 of Annex 12 to the Convention on International Civil Aviation.

**Lessons Learned Regarding Termination of Satellite Detection of 121.5 Hz Signals from Distress Beacons**

4.68 In relation to the termination from February 1, 2009 of the COSPAS SARSAT satellite capability to detect 121.5 MHz signals from distress beacons, meaning that SAR authorities no longer have satellites providing the approximate location of 121.5 MHz distress beacons, the United States presented information describing how their SAR services had to adjust to this change. This cessation of satellite tracking capability for 121.5 MHz created some confusion within the SAR services and particularly with other agencies. In retraining and educating people in the United States, many facts and lessons learned had to be brought to their attention, including:

a) 121.5 MHz VHF AM is still the international aeronautical voice distress frequency.

b) 121.5 MHz is still a low-power homing signal on the 406 MHz ELT and EPIRB.

c) International carriage requirements under ICAO and the International Maritime Organization are for the 406 MHz distress beacon and no longer the 121.5 MHz version but, national regulations may allow domestic use of 121.5 MHz distress beacons.

d) There are many 121.5 MHz ELTs and EPIRBs still in use.

e) Aircraft, and many without direction finding equipment, will hear the audible 121.5 MHz alert from these distress beacons and report them to air traffic control centers.

f) The higher the altitude of the aircraft hearing the 121.5 MHz signal then the larger the search area becomes in which the distress beacon may be located.

g) The 406 MHz Personal Locator Beacon (PLB) is growing in use by many travellers. The PLB's 406 MHz distress alert signal may cause confusion for national authorities as to which agency has responsibility to register the beacon, or to receive the alert, or to respond to the alert.

h) There is a need to determine the location of audible 121.5 MHz distress beacon alerts.

4.69 The meeting learned that in many cases national regulations still allowed use of 121.5 beacons in large populations of aircraft and that without satellite tracking ability this can lead to dramatically increased difficulties in locating such beacons. Accordingly, the United States had recently developed guidance on search planning for audible 121.5 MHz distress beacon alerts, a copy of which is included as **Appendix F** to the Report on Agenda Item 4. The meeting agreed that this information was very useful for other States to consider and agreed that the information should be made widely available to States and should also be provided to the ICAO and the International Maritime Organization (IMO) Joint Working Group on SAR as a possible amendment to the International Aeronautical and Maritime SAR (IAMSAR) Manual. The meeting agreed to the following draft Conclusions to facilitate these actions:

**Draft Conclusion SG19/8 − SAR Guidance on 121.5 MHz Search Planning**

Recognizing that large populations of aircraft would continue to use 121.5MHz distress beacons after the February 2009 cessation of COSPAS SARSAT Satellite tracking capability, States consider the guidance material *"Search Planning for Audible 121.5 Distress Beacon Alerts"* contained in Appendix F to the ATM/AIS/SAR/SG/19 Report on Agenda Item 4 when developing SAR procedures and training documentation.

**Draft Conclusion SG19/9 – Provide SAR 121.5 MHz Guidance to ICAO/IMO JWG**

That, the assistance of the United States be sought in providing a copy of the guidance material *"Search Planning for Audible 121.5 Distress Beacon Alerts"* contained in Appendix F to the ATM/AIS/SAR SG/19 Report on Agenda Item 4 to the ICAO/IMO Joint Working group on SAR for consideration as an amendment to the International Aeronautical and Maritime SAR (IAMSAR) Manual.

**Asia Pacific Runway Safety Programme Seminar**

4.70 In accordance with APANPIRG Conclusion 19/8 the United States Federal Aviation Administration (FAA) provided the Asia Pacific Runway Safety Programme Seminar at the ICAO Asia and Pacific Office from 7 – 9 April 2009.

4.71 The Seminar was organized in conjunction with the three COSCAP Programmes in Asia and it was opened to all States in the APAC region. The Seminar was also supported with presentations from Australia, Hong Kong SAR China and Japan. ICAO gave a presentation on 'Prevention of Runway Incursions ICAO Perspective'.

4.72 The meeting noted the Seminar conclusions that:

- Teamwork is critical
- SMS enables us to better understand the issues and mitigate the identified problems
- Human Factors contributions cannot be ignored
- Find the “root causes” and reduce both the likelihood and severity of the event

4.73 It was noted that Runway Safety Action Teams are an important component in maintaining runway safety and that these should comprise representatives from the Airport Authority, the Regulator, Pilots, Air Traffic Controllers and Ground operators.

**IFALPA Runway Safety Manual**

4.74 In conjunction with the report on the ICAO Runway Safety Programme Seminar IFALPA presented the IFALPA Runway Safety Manual for information to States. The meeting thanked the representative of IFALPA and noted the document, copies of which are available from IFALPA.

# Flight Level Allocation Scheme (FLAS) for Large Scale Weather Deviations (LSWD) in Western Pacific/South China Sea area

as applicable by

Fukuoka ATMC, Ho Chi Minh, Hong Kong, Kota Kinabalu, Manila, Naha, Sanya, Singapore and Taipei ACCs

| Flight Level Allocation (LSWD) | ATS Route and Direction of Flight | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **N892** | **L625** | **N884** *(South of LBG)* | **N884** *(North of CAB)* | **M767** | **A582/B462** | | **A590** | | **L642** | **M771** |
| | SW | NE | NE | NE | SW | E | W | E | W | SW | NE |
| 410 | | | | 410 | | | | | | | |
| 400 | 400 | | | | 400 | | | | 400 | 400 | |
| 390 | | 390 | 390 | | | 390 | | 390 | | | 390 |
| 380 | | | | | | | 380 | | | | |
| 370 | | | | 370 | | | | | | | |
| 360 | 360 | | | | 360 | | | | 360 | 360 | |
| 350 | | 350 | 350 | | | 350 | | 350 | | | 350 |
| 340 | | | | | | | 340 | | | | |
| 330 | | | | 330 | | | | | | | |
| 320 | 320 | | | | 320 | | | | 320 | 320 | |
| 310 | | 310 | 310 | | | 310 | | 310 | | | 310 |
| 300 | | | | | | | 300 | | | | |
| 290 | | | | 290 | | | | | | | |

## Activation conditions:

1) The LSWD procedures will be activated to mitigate effects of widespread adverse weather. Coordination will be conducted in accordance with Operational Letters of Agreement (LOA) between the affected ACCs with the objective of implementing LSWD procedures simultaneously by all ACCs.

2) Activation of LSWD procedures is intended to mitigate situations of potential loss of lateral separation between ATS routes served by the same No-PDC flight levels. For example, this could include situations where 5 or more deviations of more than 10 NM are experienced/anticipated in a 30 minute period and those deviations can not be completed within one FIR.

*3)* In circumstances where deviations are wholly contained within one FIR, or suitable coordination can be completed between two adjacent FIRs, activation of LSWD procedures may not be necessary.

**ASIA/PACIFIC REGION**

**INTERIM STRATEGY FOR THE IMPLEMENTATION OF NEW ICAO FLIGHT PLAN FORMAT AND SUPPORTING ATS MESSAGES**

**Recognizing that:**

1) Dynamic information management will assemble the best possible integrated picture of the historical, real-time and planned or foreseen future state of the ATM situation and provide the basis for improved decision making by all ATM community members;

2) The *Global Air Traffic Management Operational Concept* (Doc 9854) requires information management arrangements that provide accredited, quality-assured and timely information to be used to support ATM operations;

3) ATM Requirement 87 in the *Manual of Air Traffic Management System Requirements* (Doc 9882) provides that 4-D trajectories be used for traffic synchronization applications to meet ATM system performance targets, explaining that automation in the air and on the ground will be used fully in order to create an efficient and safe flow of traffic for all phases of flight;

4) The amended ICAO Flight Plan and associated ATS Message formats contained in Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, applicable 15 November 2012) have been formulated to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management systems; and

5) The complexities inherent in automated computer systems preclude the adoption of a single regional transition date and transitions to the new flight plan provisions will therefore occur throughout the declared transition period. Accordingly, pursuit/adoption of a single 'global' implementation date is also not viable.

**The Asia/Pacific implementation of Amendment 1 to the PANS-ATM shall:**

1) Ensure that all States and airspace users implement the full provisions of Amendment 1 from 15 November 2012, not just selected aspects of the Amendment;

2) Acknowledge that States not implementing the full provisions of Amendment 1 from 15 November 2012 are obligated to publish the non compliance in State AIP as a 'significant difference' well in advance of the 15 November 2012 applicability date and will be included on the APANPIRG List of Deficiencies in the ATM/AIS/SAR Fields; and

3) Ensure that, from 15 November 2012, all States and airspace users accept and disseminate 'NEW' flight plan and associated ATS message formats only and capabilities for 'PRESENT' flight plan provisions are discontinued.

*(**Note:** In the context of the implementation, 'PRESENT' refers to the existing flight planning and ATS message formats as defined in the current version of the PANS-ATM and 'NEW' refers to the amended provisions as contained in Amendment 1 to the PANS-ATM.)*

**The Asia/Pacific transition to the PANS-ATM Amendment 1 provisions shall:**

1) Comply with the regional guidance provided by APANPIRG's Asia/Pacific Flight Plan and ATS Messages Task Force (FPL&AM/TF);

2) Preserve global consistency in implementation by basing implementation activities, to the extent possible, on Guidelines 1 to 6 described in the ICAO guidance material in State Letter AN 13/2.1-09/9, dated 6 February 2009;

3) Ensure that the FPL&AM/TF undertakes coordination to facilitate harmonization with implementations in neighbouring regions;

4) Eliminate or minimize State specific constraints and, if constraints are identified as necessary, implement such constraints on a regional or sub regional basis in preference to an individual State basis;

5) Declare a transition period from 1 July 2011 until 15 November 2012, and encourage States to implement 'NEW' capability between 1 July 2011 and 1 July 2012;

6) Not implement 'NEW' capability by States or users before the commencement of the transition period (i.e. no 'NEW' before 1 July 2011);

7) Encourage States to immediately commence preparations to implement Amendment 1 provisions and report progress to the FPL&AM TF periodic meetings;

8) Require States to inform the Regional Office of scheduled transition date by 1 July 2010 for relay to the FPL&AM TF;

9) Consider a regional constraint on requiring acceptance of flight plans more than 24 hours prior to Estimated Off Blocks Time (EOBT) during the transition period, to mitigate Date Of Flight (DOF) complexities;

10) Require that States retain capability to simultaneously support 'PRESENT' and 'NEW' provisions (flight plan and ATS message format) from the activation of their 'NEW' capabilities until the end of the transition period;

11) Encourage users to implement capability to simultaneously support 'PRESENT' and 'NEW' provisions from activation of their 'NEW' capabilities until the end of the transition period;

12) Recognize that until a number of adjacent States are providing 'NEW' capability, advantages do not accrue to users. Accordingly, users may not commence transition until the latter part of the transition period; and

13) Avail of States with expertise in automated ATM ground systems to support the conduct of a Regional Office Seminar during November 2009.

*(last amended FPL&AM TF/1, March 2009)*

# ICAO HQ CLARIFICATION OF ISSUES RAISED BY FPL&AM/TF/1

## GENERAL

Clarifications will be made to all Regional Offices through the Flight Plan Implementation Tracking System (FITS) being developed by the Air Navigation Bureau to track the implementation of the new provisions and share lessons learned. The implementation status of the new provisions in all FIRs will be contained in FITS, where issues related to implementation will be posted.

More specific clarifications on paragraph 4.4 of the FPL&AM/TF1 Meeting are described below. Regarding paragraphs 6.8 through 6.14 [Submit only required parameters in filed FPL & Date of Flight (DOF) issues], the global initiative is to implement the amendment as it is and any proposals for deviations from the general tenor of the amendment should be coordinated early with the other Regional Offices and ICAO Headquarters in an attempt to find common ground and a common approach.

In relation to the Date of Flight (DOF), to allow collaborative decision making and to work in a performance based environment, early submission of flight plan information by airspace users to the ATM system is necessary. This will support global needs fro sharing flight information, but in a manner where regional and local needs can be accommodated. The provision of early flight plan information will support demand/capacity balancing and aerodrome operations and will be aligned with the ATM community expectations of access and equity, capacity, efficiency, flexibility and predictability

## SPECIFIC

### COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)

A-1) The number of characters in the surveillance equipment and capabilities subset of Item 10 has been defined as a maximum of 20 characters. However other subsets in Item 10 have not had ‘maximum characters’ defined, nor had many of the other fields. Recognizing that a defined number of characters per field or sub field was valuable when coding software as it removed any need to make field capacity available that would never be used, the meeting sought clarification as to the different approach applied to different fields. The meeting also considered that agreeing on an Asia/Pacific requirement for number of characters per field or sub field would result in worthwhile standardisation and economies for States and should be pursued by the Task Force and adopted as a regional flight planning constraint.

### CLARIFICATION

The limitation of 20 characters for the surveillance equipment and capabilities of Item 10 was considered appropriate taking into consideration the number of possible entries. For the navigation/communication equipment and capabilities, it was recommended not to establish a limit due to the number of possible combinations. The creation of a regional “sub-specification”, while beneficial for intra-regional operations, may pose significant impact on inter-regional operations by raising both the complexity and potential for the establishment of regional standards that, in the aggregate, may exceed the overall message length limitations. Considering the above, it is recommended to keep the size of Item 10 for the NAV/COM with the capacity to inform the recipient of as many equipment and capabilities as possible, and to balance this with the message total length.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-2) … the International Air Transport Association (IATA) raised concerns that the allocation of 16 characters to PBN/ in Item 18 may not be sufficient to adequately record the number of PBN approvals in some instances of long haul flights through a multitude of differing RNP airspaces. IATA would investigate this matter more fully and inform the next meeting of the outcomes.

**CLARIFICATION**

The maximum number of possible combinations is 28 characters. This is possible if one aircraft is capable of most PBN operations with some capabilities only provided by specific sensors. The new provisions cover a representative subset to support a long-haul flight. Typical capabilities will be covered by 16 characters. The intent of IATA to investigate further is noted.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-3) The sequence of information in Item 18 has been defined, ensuring that the Item 18 information would be inserted in a specific and repeatable order. This was not the case in Item 10, for example, suggesting that Item 10 information could be inserted in any order. Recognising that a specific sequence of codes was more easily 'read' by automation equipment, the meeting sought clarification as to the different approach applied to different fields.

**CLARIFICATION**

The order introduced in Item 18 was in recognition of the limits imposed by the AFTN, and duplicated in some existing ATC systems. The order is a priority order intended to ensure that if the message is truncated the likelihood would be that the lost data would be the least important.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-4) In Item 7, the presentation of the Amendment indicated item b) occurring before item a), as shown below, rather than the traditional presentation whereby a) normally precedes b). The rationale for this was unclear and could bestow undue priority on the use of registration markings as the radiotelephony callsign for each flight. The meeting confirmed its strong preference for 'flight number callsigns' and agreed that in the Asia/Pacific implementation, use of the designator for the aircraft operating agency followed by the flight number would take precedence.

**CLARIFICATION**

The comment is accepted and items 7 a) and b) will be **reordered** in the published amendment.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-5) Item 10 requires the use of 'N' if no COM/NAV/approach aid equipment is carried, or 'S' if standard COM/NAV/approach aid equipment is carried. However the example given at the end of Item 10 does not include N or S, see below: Is there a number of characters limitation on this field that, when reached, results in dropping the first character – or should the S or N always be included?

Example: ADE3RV/HB2U2V2G1

**CLARIFICATION**

The S or N will always be used when they are required to inform the recipient of Standard or NO COM/NAV equipment. The example describes a specific situation where S or N do not apply. Regarding the limitation on the length of the Item, see A-1.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-6) The changes contained in Appendix 3, Air Traffic Service Messages, now require that Item 18 (Other Information) must now be included in CHG, CNL, DLA, DEP and RQS messages. Although it appears this change is necessitated by the new allowance of FPL filing up to 120 hours in advance which requires inclusion of DOF/ in Item 18, the Amendment 1 to the PANS-ATM has the effect of requiring that the entire Item 18 be routinely included in CHG, CNL, DLA, DEP and RQS messages. Item 18 is a very lengthy field, so the change has the consequence of vastly increasing the size of ATS messages being sent over AFTN networks and greatly increasing associated message storing and processing functions in ANSP systems which handle these messages.

The example CHG message shown at paragraph 2.3.2.2 includes a DOF/ change, but does not include other Item 18 information (see below), also suggesting that the intention is simply to transmit DOF/ changes in CHG, CNL, DLA, DEP and RQS messages, rather than the full Item 18 information.

However, recognising that in automated systems the technique of completely overwriting a full field rather than amending a small portion of a field is commonly used, the meeting realised that it was possible that the new requirement to transmit the entire Item 18 in CHG, CNL, DLA, DEP and RQS messages was necessary. However, the Task Force would study whether adoption of a regional constraint that would result in DOF/ being the only Item 18 information included in CHG, CNL, DLA, DEP and RQS messages was at all feasible. The meeting considered that an urgent clarification was required in this case, as it could not identify any advantage to including full Item 18 data and either the routine transmission of bulky data or adoption of a regional constraint would undoubtedly cause global message processing problems.

**CLARIFICATION**

In the mentioned example please note that there is no change in the date of flight identified in Item 18. The changes are in Items 8 and 16 as described in Field Type 22. It is agreed that in the messages concerned there is no useful reason to put all Item 18 information if there is no change in the referred Item. Field Type 18 in a CHG message shall not contain the changes. They go in Field Type 22. Field Type 18 with DOF specified in such messages it is meant to uniquely identify the flight when the FPL is presented more than 24 hours in advance and there is no need to include all the other Item 18 information in those messages.

Appendix 3, Field Type 16 – Table, should be interpreted as follows:

| *Previous type of field or symbol* | *This type of field is used in* | *Next type of field or symbol* | |
|---|---|---|---|
| 13 | CHG** | DOF/YYMMDD | from Item 18 –IF- that indicator was filed with the original message |
| | | | -OR- |
| | | 22 | if no DOF/ indicator was filed with the original message |
| 13 | CNL | DOF/YYMMDD | from Item 18 –IF- that indicator was filed with the original message |
| | | | -OR- |
| | | ) | if no DOF/ indicator was filed with the original message |
| 13 | DLA | DOF/YYMMDD | from Item 18 –IF- that indicator was filed with the original message |
| | | | -OR- |
| | | ) | if no DOF/ indicator was filed with the original message |
| 13 | DEP | DOF/YYMMDD | from Item 18 –IF- that indicator was filed with the original message |
| | | | -OR- |
| | | ) | if no DOF/ indicator was filed with the original message |
| 13 | RQS | DOF/YYMMDD | from Item 18 –IF- that indicator was filed with the original message |
| | | | -OR- |
| | | ) | if no DOF/ indicator was filed with the original message |

** Note – if the CHG includes modifications to Item 18:

- The original DOF/ information should be entered in the Field Type 18 section of the CHG message; and
- The entire Item 18 information (which includes the change) must still be entered in Field Type 22 (i.e., a complete replacement for Item 18).

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-7) Discrepancies exist between the Item 18 TYP/ data shown for the Flight Plan and that shown for ATS messages. The meeting sought clarification in respect to the use or non-use of commas between aircraft types, noting that the Flight Plan (page 16 of Amendment 1) indicates that

TYP/ Type(s) of aircraft, preceded if necessary without a space by number(s) of aircraft and separated by one space, if ZZZZ is inserted in Item 9.

Example: TYP/2F15 5F5 3B2

whereas, the ATS message (page 30 of Amendment 1) includes commas between aircraft types, as shown below:

TYP/ Type(s) of aircraft, preceded if necessary without a space by number(s) of aircraft and separated by one space, if ZZZZ is inserted in Item 9.

Example: –TYP/2F15, 5F5, 3B2

**CLARIFICATION**

The comments are accepted and in the published version the comas from Field Type 18, TYP/ on page 30 will be **removed**.

**COMMENTS BY THE FLIGHT PLAN & ATS MESSAGES IMPLEMENTATION TASK FORCE (FPL AM/TF/1)**

A-8) The meeting noted that neither the PRESENT or NEW provisions made allowance for an equipment field in Section 6 & 7 of Appendix 2 of the PANS-ATM, in relation to Repetitive Flight Plans (RPL). The absence of such a field had led to local arrangements being agreed within and between some States in some instances to enable equipage to be notified in RPLs.

The meeting was of the view that having information in relation to equipage was of importance in RPL arrangements and sought ways to formalise the situation. Clarification was sought as to whether it was possible to include an equipment field in RPL, or whether the Task Force should pursue a regional constraint as part of the implementation process.

**CLARIFICATION**

The amendment didn’t change the RPL provisions. Historically it is assumed that aircraft filing a RPL are 'S' equipped for the route to be flown. Regional arrangement, like the use of EQPT/ to provide Field 10 info within Item Q of the RPL could be a Regional solution if deemed necessary.

— END —

# STATE SAR AGREEMENTS

***(last updated 26 June 2009)***

| ID NO. | DATE | STATES | REMARKS |
|---|---|---|---|
| 1 | 14 April 1972 | ASEAN States - Indonesia, Malaysia, Philippines, Singapore and Thailand | Multilateral agreement for the facilitation of search for aircraft in distress and rescue of survivors of aircraft accidents |
| 2 | March 1997 | Viet Nam - ASEAN | Viet Nam signed instrument of accession to 1972 ASEAN Agreement (as above) |
| 3 | June 1982 | Indonesia / Singapore | |
| 4 | 11 August 1984 | Malaysia / Singapore | |
| 5 | 29 August 1985 | Malaysia / Indonesia | |
| 6 | September 1985 | Singapore / Thailand | Updated July 1996 |
| 7 | 9 September 1985 | Malaysia / Thailand | |
| 8 | 9 December 1985 | Malaysia / Philippines | |
| 9 | August 1986 | Indonesia / Philippines | |
| 10 | 1986 | United States / Japan | |
| 11 | 1988 | United States / Indonesia | |
| 12 | 1990 | Indonesia / Papua New Guinea | JBC MOU signed |
| 13 | November 1990 | Australia / Indonesia | Updated 5 April 2004 |
| 14 | July 1996 | Philippines / Singapore | |
| 15 | July 1996 | Viet Nam / Singapore | |
| 16 | September 1996 | Viet Nam / Philippines | |
| 17 | 16 December 1998 | Malaysia / Brunei Darussalam | |
| 18 | 1998 | Lao PDR / Vietnam | LOA for provision of assistance |
| 19 | February 1999 | Cambodia / Viet Nam | |
| 20 | February 2001 | Australia / Papua New Guinea | |
| 21 | September 2002 | New Caledonia / New Zealand | |
| 22 | November 2002 | United States / Republic of Palau | |

| ID NO. | DATE | STATES | REMARKS |
|---|---|---|---|
| 23 | 2003 | United States / New Zealand | |
| 24 | notified 2003 | United States / Marshall Islands | |
| 25 | notified 2003 | United States / Micronesia | |
| 26 | notified 2003 | United States / China | |
| 27 | June 2005 | Tonga / New Zealand | |
| 28 | notified 2005 | New Zealand / Australia | |
| 29 | notified 2005 | New Zealand / Samoa | |
| 30 | April 2006 | Australia / Maldives | Letter of Arrangement |
| 31 | notified July 2006 | Indonesia / United States | Agreement on the Coordination of SAR Services |
| 32 | notified July 2007 | New Zealand / Cook Islands, | |
| 33 | notified July 2007 | New Zealand/Chile | Final draft agreement being considered by authorities in Chile |
| 34 | notified July 2007 | New Zealand/Niue | No requirement for separate SAR agreement, covered under Government to Government aid agreement |
| 35 | notified July 2007 | New Zealand/Tahiti French Polynesia | Final draft agreement being considered by authorities in Tahiti |
| 36 | notified July 2007 | New Zealand/Tokelau | No requirement for separate SAR agreement, covered under Government to Government aid agreement |
| **37** | **16 May 2007** | **Republic of Korea/China** | |
| **38** | **30 April 2008** | **Republic of Korea/Japan** | |

*Note: ATM/AIS/SAR/SG/18 re-ordered the List by date, any additional updated entries by APANPIRG/19 in bold type.*

Analysis of SAR Capability of ICAO States in the ASIA/PAC Region

| | Training | Alerting | Legislative | SAR committee | Agreements | Relationships | Communications | Quality Control | Civil/Military | Resources | SAREX | Library | Computerisation | SAR programme | Supply dropping | Special equipment | SAR aircraft | Navigation | ELTs | Cospas-Sarsat Distr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | E | E | E | E | E | C | E | E | E | E | E | E | E | E | E | E | E | C | E | |
| Bangladesh | B | C | D | A | A | C | C | A | D | A | A | C | A | A | C | C | D | A | D | C |
| Bhutan | | | | | | | | | | | | | | | | | | | | |
| Brunei | E | E | E | E | E | E | E | E | E | E | E | E | E | E | D | D | E | E | E | A |
| Cambodia | B | B | B | B | B | B | C | A | B | B | A | C | A | A | A | A | B | A | A | A |
| China | E | E | E | E | E | E | D | D | E | D | D | C | B | A | E | E | E | E | E | A |
| Cook Islands | A | B | B | A | A | C | C | C | B | A | B | A | A | A | A | B | B | A | E | A |
| DPR Korea | B | D | B | D | A | B | D | D | D | C | B | A | A | A | B | A | C | C | A | A |
| Fiji | B | C | C | C | C | C | C | B | D | C | D | C | A | C | B | A | C | C | C | A |
| French Polynesia | C | D | D | D | C | D | E | A | E | C | C | B | A | A | E | D | E | E | E | A |
| Hong Kong, China | E | E | E | E | D | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E |
| India | D | C | C | B | B | C | C | A | C | C | C | C | C | D | D | D | C | A | B | E |
| Indonesia | E | D | E | E | E | D | D | D | E | D | E | D | D | D | C | D | D | D | D | E |
| Japan | E | E | E | E | D | E | E | E | E | E | E | E | D | E | E | E | E | E | E | E |
| Kiribati | | | | | | | | | | | | | | | | | | | | |
| Lao PDR | B | A | B | B | B | A | B | A | B | B | A | C | A | A | A | A | A | A | A | A |
| Macau, China | E | | | | | E | E | | | | E | | | | | | E | | | |
| Malaysia | E | E | C | E | D | E | E | E | E | E | E | D | E | E | E | D | E | E | E | B |
| Maldives | B | A | A | A | A | A | A | A | D | A | C | A | A | A | A | A | A | A | A | A |
| Marshall Islands | | | | | | | | | | | | | | | | | | | | |
| Micronesia | C | B | | A | A | B | C | | | | | A | | B | B | | | | | |
| Mongolia | A | C | C | A | B | B | B | A | B | B | B | C | B | B | A | A | A | A | B | A |
| Myanmar | B | A | B | C | A | D | C | C | D | A | A | A | A | A | C | A | D | C | A | A |
| Nauru | | | | | | | | | | | | | | | | | | | | |
| Nepal | D | D | C | B | A | C | C | B | D | B | A | B | A | D | D | C | D | D | D | B |
| New Caledonia | C | D | D | D | C | D | E | A | E | C | C | B | A | A | E | D | E | E | E | E |
| New Zealand | E | E | E | E | A | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E |
| Pakistan | C | C | D | D | A | D | D | C | D | C | A | A | A | A | D | A | D | D | C | E |
| Palau | | | | | | | | | | | | | | | | | | | | |
| Papua New Guinea | D | E | D | C | D | D | C | C | D | C | C | D | C | C | C | A | A | A | E | A |
| Philippines | D | C | E | D | D | C | D | D | E | C | C | C | C | C | C | B | C | E | C | A |
| Rep. of Korea | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E |
| Samoa | | | | | | | | | | | | | | | | | | | | |
| Solomon Islands | | | | | | | | | | | | | | | | | | | | |
| Singapore | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E |
| Sri Lanka | D | A | C | D | B | C | C | D | E | D | B | C | A | A | D | D | C | A | C | A |
| Thailand | E | E | E | E | D | E | E | E | E | E | E | D | D | D | E | E | E | E | E | E |
| Timor Leste | | | | | | | | | | | | | | | | | | | | |
| Tonga | C | B | A | A | B | C | C | A | D | A | A | A | A | A | A | A | C | A | E | A |
| United States | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E |
| Vanuatu | | | | | | | | | | | | | | | | | | | | |
| Viet Nam | D | D | D | E | D | D | D | C | E | D | C | C | B | C | C | D | D | C | D | **D** |

**Last updated 26 June 2009**

| | |
|---|---|
| Categorisations: | |
| A = Not implemented | D = Meets Annex 12 requirements in most areas |
| B = Initial implementation | E = Fully meets Annex 12 requirements |
| C = Meets Annex 12 requirements in some areas | Blank = No response |

**APANPIRG State SAR Capability Matrix**

**Guidance to complete the Matrix**

1. **Training**
   - The appropriate level and type of training for SAR coordinator, SAR mission coordinator, on-scene coordinator, and operational facilities. (IAMSAR Manual Vol. 1, Chapter 3)

2. **Alerting**
   - Fast and reliable means for the rescue coordination center to receive distress alerts. (IAMSAR Manual Vol. 1, Chapter 2)

3. **Legislative**
   - Statutes and related provisions that establish a legal foundation for establishing a SAR organization and its resources, policies, and procedures. (IAMSAR Manual Vol. I, Chapter 1)

4. **SAR committee**
   - Typically established under a national SAR plan, the SAR coordinating committee is comprised of SAR system stakeholders. (IAMSAR Manual Vol. 1, Chapter 6 and Appendix J)

5. **Agreements**
   - States should enter into agreements with neighboring States to strengthen SAR cooperation and coordination. (Chapter 3 – *Cooperation*, in both Annex 12 – Search and Rescue, and the International Convention on Maritime SAR)

6. **Relationships**
   - Close cooperation between services and organizations which may contribute to improving SAR service in areas such as operations, planning, training, exercises and research and development.

7. **Communications**
   - Communication capability for receipt of distress alerts and operational coordination among the SAR mission coordinator, the on-scene coordinator and SAR facilities. (IAMSAR Manual Vol. 1, Chapter 3)

8. **Quality Control**
   - Procedures to focus on improving the quality of SAR services so as to improve results and reduce costs. (IAMSAR Manual Vol. 1, Chapter 6)

9. **Civil/Military**
   - Close cooperation between the various civilian and military organizations.

10. **Resources**
    - The primary operational facilities made available to the national SAR system by various authorities and arrangements with others. (IAMSAR Manual Vol. 1, Chapter 5 and Appendix C)

**11. SAR Exercise**

- Exercise to test and improve operational plans, provide learning experience and improve liaison and coordination skills. (IAMSAR Manual Vol. 1, Chapter 3; Annex 12, and Annex 14 regarding Airport Emergency Plan)

**12. Library**

- Quick access to the applicable international, national, and agency SAR publications that provide standards, policy, procedures and guidance.

**13. Computerization**

- Use of or access to output of various computer resources including databases, computer aids for SAR system management, search planning software, etc. (IAMSAR Manual Vol. 1, Chapter 2)

**14. SAR programme**

- National structure to establish, manage and support the provision and coordination of SAR services. (IAMSAR Manual Vol. 1, Chapter 1)

**15. Supply dropping**

- Supplies and survival equipment carried by air and maritime SAR facilities to aid survivors and facilitate their rescue, as appropriate. (IAMSAR Manual Vol. 1, Chapter 2 and Appendix B)

**16. Special equipment**

- Equipment created for specific rescue scenarios (such as mountain or desert rescue) and equipment typically carried on designated SAR units to support coordination and locating functions as well as special supplies and survival equipment to aid survivors and facilitate their rescue. (IAMSAR Manual Vol. 1, Chapter 2 and 4)

**17. SAR aircraft**

- An aircraft provided with specialized equipment suitable for the efficient conduct of SAR missions (Annex 12, Chapter 2 - *Organization*)

**18. Navigation**

- Suitable means provided within the SAR region to determine position, and the responding SAR facilities have the appropriate equipment on board to determine their position in the SAR region they are likely to operate. (IAMSAR Manual Vol. 1, Chapter 2)

**19. Emergency Locator Transmitter (ELT)**

- National regulations for carriage of ELTs, and arrangements for registration of the 406 MHz beacon and rapid access to the beacon registration database. (Annex 6 – Operation of Aircraft and Annex 10 - Aeronautical Telecommunications; and IAMSAR Manual Vol. 1, Chapter 4)

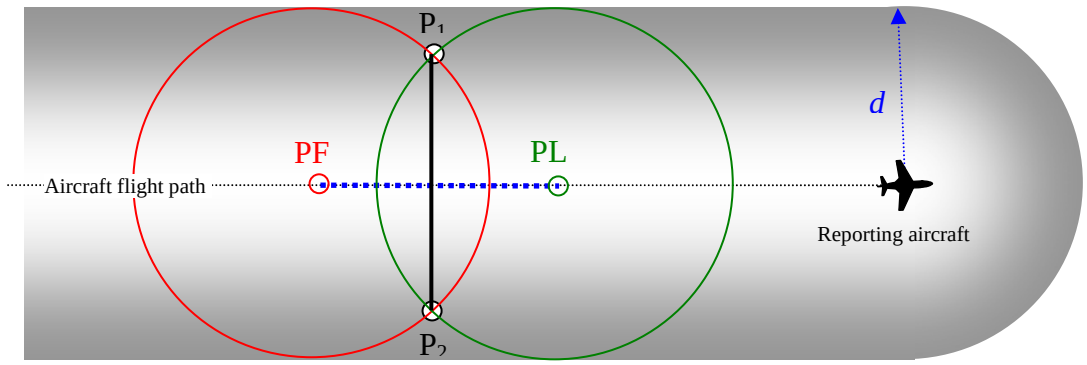
**20. Cospas-Sarsat Distress Alerts**

- A SAR Point of Contact (SPOC) designated for receipt of Cospas-Sarsat distress data, and arrangements for efficient routing of the distress data to the appropriate SAR authority (the aeronautical emergency locator transmitter ELT), maritime emergency position-indicating beacon (EPIRB), and personal locator beacon (PLB)). (Annex 12, paragraph 3.2.5 and Section 2.4; and, IAMSAR Manual Vol. 1, Chapter 4)

**Search Planning for Audible 121.5 MHz Distress Beacon Alerts**

1. Search planning for audible 121.5 MHz beacon alerts will most often result from reports received from commercial aircraft flying at high altitude. These reports will result in relatively large areas for the possible location of the beacons. The methods that follow will help reduce those areas and provide search options. These same methods apply equally to audible alerts from low-flying aircraft, general aviation, and surface radio reception of 121.5 MHz beacon alerts.

2. Figure 1 depicts the Geometry for a typical case where a reporting aircraft passes within reception range of beacon signal. It is provided as a visual and labeling reference for employing the planning methods that follow.




Where:
PFH = point first heard
PLH = point last heard
*d* = horizon distance for radio reception at a given height of antenna (aircraft altitude)
$P_1$ = Intersect position one
$P_2$ = Intersect position two

**Figure 1 Audible Beacon Alert; Geometry for typical case where reporting aircraft passes within reception range of beacon signal**

3. **Record 121.5 report data** in the following table. Although all the information is important and aids in refinement of the possible location of the beacon, the minimum information required to determining a probable area for the reported beacon is the position and antenna height for points first heard (PFH) and last heard (PLH).

**Table 1 121.5 MHz Beacon Alert report data**

| Point | Date-Time | Position (lat/long) | Aircraft Altitude (h) (ft) | Course (degrees true) | Speed over ground (kts) |
|---|---|---|---|---|---|
| **PFH** (first heard) | | N/S<br>E/W | | | |
| **PLH** (last heard) | | N/S<br>E/W | | | |

4. **Plot the line corresponding to the track of the aircraft**. Use either rhumb line or great circle navigation depending on the track being followed by the reporting aircraft.

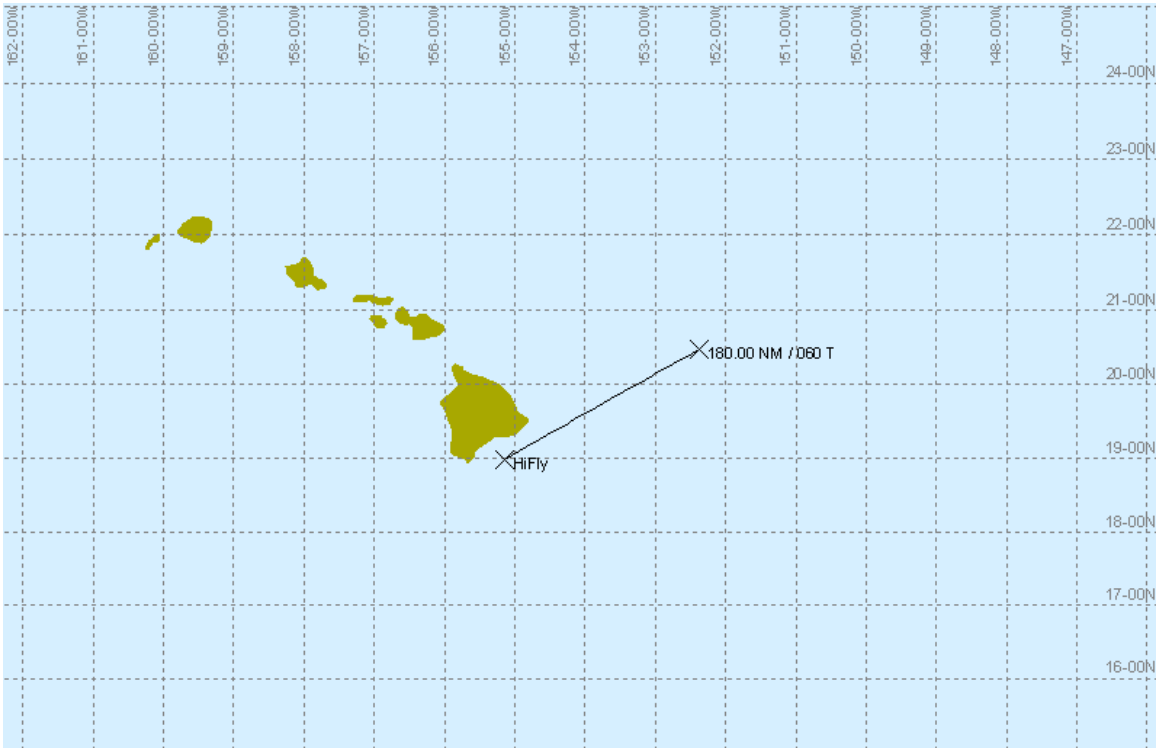



**Figure 2 Plot of PFH & PLH**

5. **Compute and plot the distance to the radio (VHF/UHF) horizon** (***d***) for the reporting aircraft at PFH & PLH**.**

   a. The horizon distance is estimated using the following equation:

$$d = 1.23 \times \sqrt{h}$$

   Where:
   ***h*** is the antenna height above the water (e.g., mean sea level) in feet, and
   ***d*** is the Horizon Distance (reception range) for the reporting aircraft in nautical miles (nm).

   b. Record the results in the following table.

**Table 2 Radio horizon distance**

| Point | Aircraft Altitude (h) (ft) | Radio Horizon Distance (*d*) (nm) |
|---|---|---|
| **PFH** | | |
| **PLH** | | |

c. Draw circles centered on the PFH and PLH with a radius equal to the computed radio horizon distance for each point at the given altitude for each as recorded in Table 2 (shown in Figure 3).

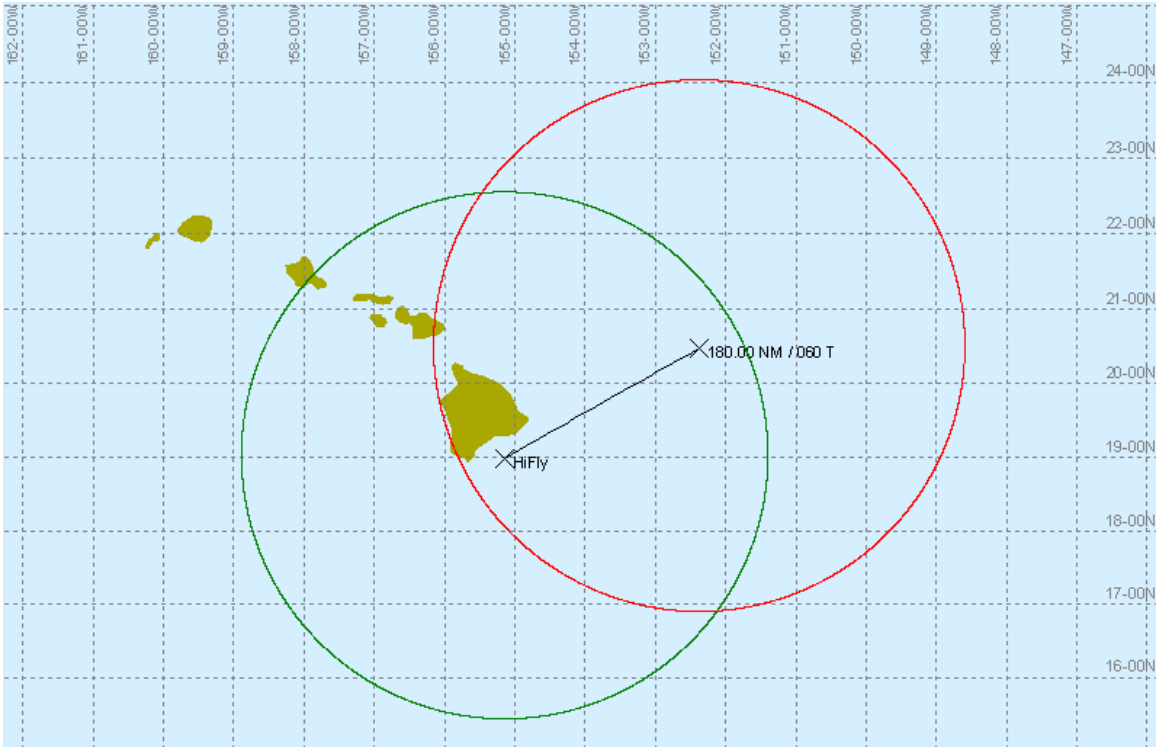



**Figure 3 Plot of computed radio horizon distances for PFH & PLH**

6. **Plot the intersect line.** The two circles should intersect in two places. Draw a line between the two points where the circles intersect. This line will bisect the line connecting PFH and PLH positions.

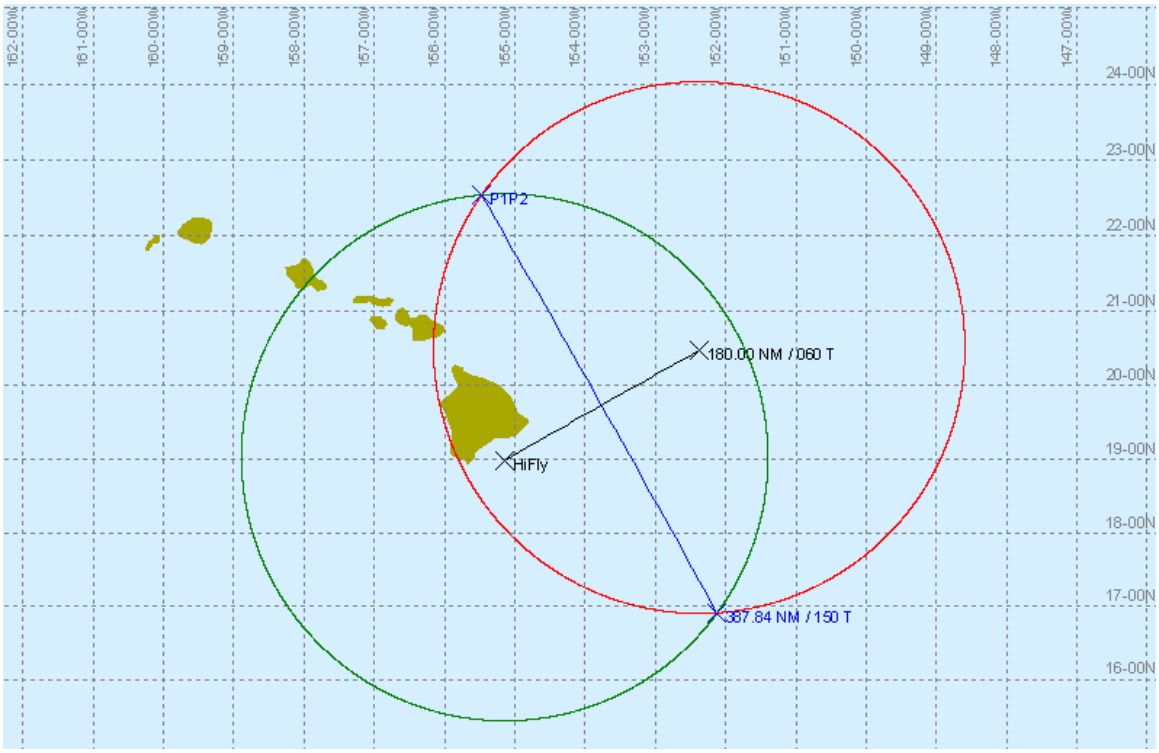



**Figure 4 Plot of the intersect line**

7. **Determining Search Areas based on a Single Report.** With only a single report from a high-flying aircraft and the associated long distances, large search areas will result and search options will be limited.

   a. Generally, with a single report only an electronic search may be possible to attempt to reacquire the beacon and then use radio direction finding capabilities to home in on the signal. The electronic search may be accomplished reasonable quickly with a single track search under most circumstances.

   b. If an aircraft SAR unit (SRU) is deployed, it should proceed to the nearest point where the two circles intersect and then fly to the other point where the two circles intersect at a high altitude. An example of this method is illustrated in Figure 5. This should bring it closer to the beacon. Once the beacon is acquired, the SAR unit can home on it until located.

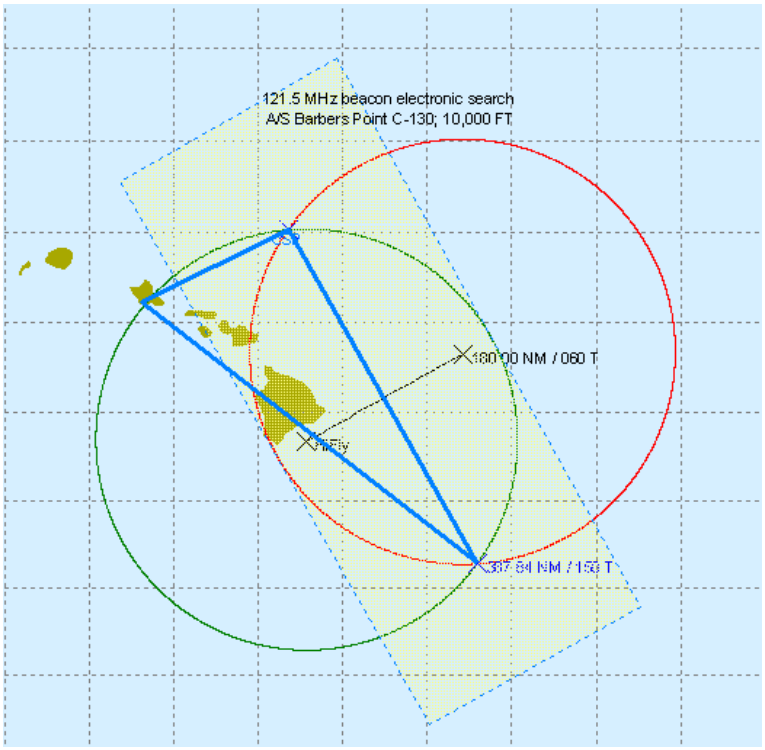



**Figure 5 Aircraft SRU search down the intersect line at an altitude of 10,000 feet with a radio horizon range of 123 nm.**

c. If necessary, a multi-leg track line pattern may be used to cover the area contained in the intersection of the two circles. This might be necessary if the maximum altitude of the SRU limits its maximum detection range to a value significantly smaller than one-half the maximum width of the intersection of the two circles. A similar PS search could also be used.

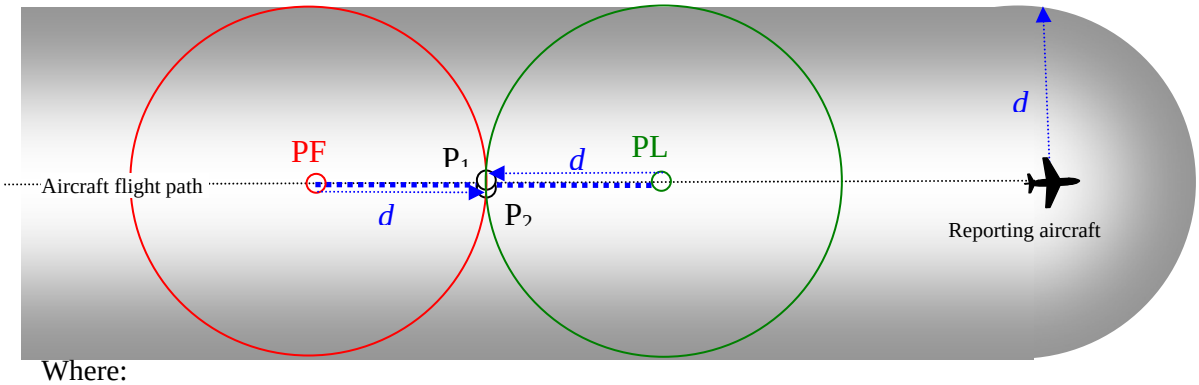
8. **Special case: flying directly over a beacon.** A special case occurs when the reporting aircraft passes directly over or nearly over the beacon position as shown in Figure 6. When this occurs, the search aircraft may effectively proceed down the same trackline as the reporting aircraft. This special case is indicated when the distance over which the beacon was heard is twice (or nearly so) the calculated radio horizon distance (***d***) for the reporting aircraft's altitude.

9. **When not to Search along the reporting aircraft's trackline.** In most cases the reporting aircraft will not pass directly or nearly directly over the beacon which will preclude the search aircraft from merely proceeding down the same trackline to conduct an electronic search if the search aircraft altitude is significantly lower then the reporting aircraft altitude.

a. As shown in Figure 7 the reduced reception range at the lower altitude for the search aircraft may indeed result in the signal being missed. The example for a beacon heard off Hawaii shows this. With the reporting aircraft at 30,000 feet and the search aircraft at 10,000 feet the two primary locations would be missed by a search down the reporting aircraft's track as shown in figure 8. For this particular case, even searching at 20,000 feet the radio horizon for the search aircraft would not encompass the entire area.

b. The preferred alternative in most situations is to conduct the search along the intersect as detailed in paragraph 7, shown in Figure 9, and practically demonstrated in Figure 5; again with the reporting aircraft at 30,000 feet and search aircraft at 10,000 feet.

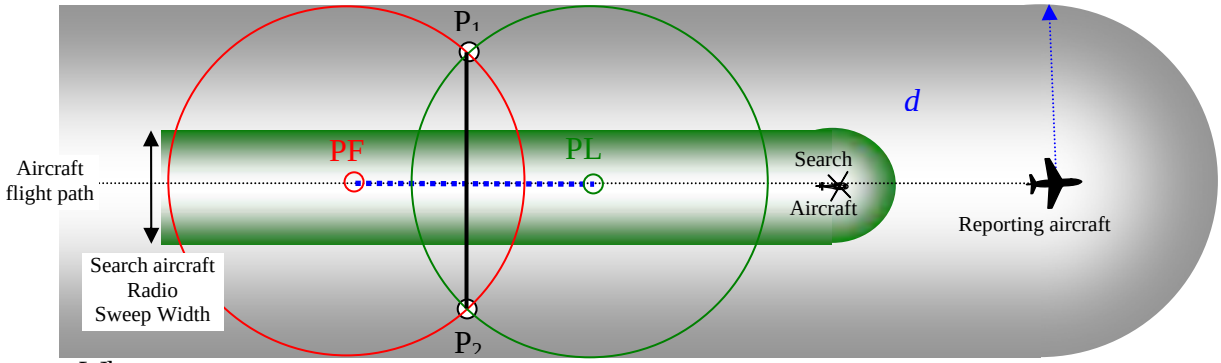
c. If the search along both the track and perpendicular to the track will not work, a multiple leg track search may have to be used. In those situations, the search duration may make the search unreasonable and lacking corroborating information or additional reports, a decision on whether to search or not may be necessary.




Where:

PFH = point first heard
PLH = point last heard
*d* = horizon distance for radio reception at a given height of antenna (aircraft altitude)
$P_1$ = Intersect position one
$P_2$ = Intersect position two

**Figure 6 Audible Beacon Alert; Basic geometry for special case where reporting aircraft passes directly over the beacon position**




Where:

PFH = point first heard
PLH = point last heard
*d* = horizon distance for radio reception at a given height of antenna (aircraft altitude)
$P_1$ = Intersect position one
$P_2$ = Intersect position two

**Figure 7 Search aircraft at lower altitude than reporting aircraft – same track; beacon signal not heard**

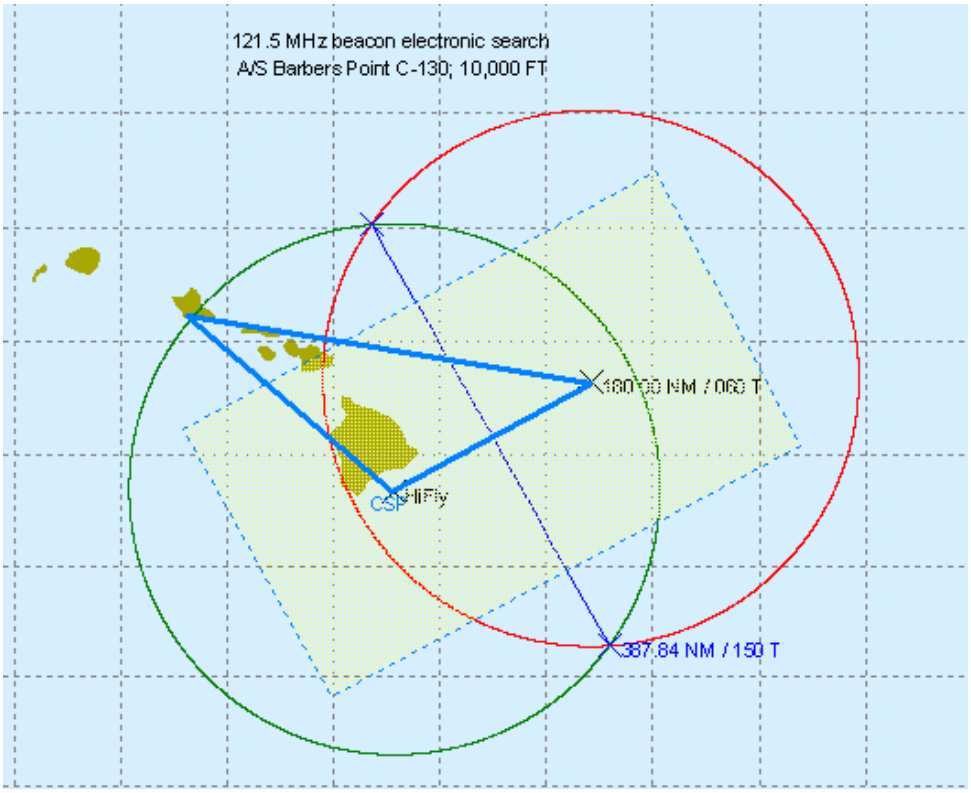



**Figure 8 Search aircraft at 10,000 feet, reporting aircraft at 30,000 feet – same track; beacon signal not heard**

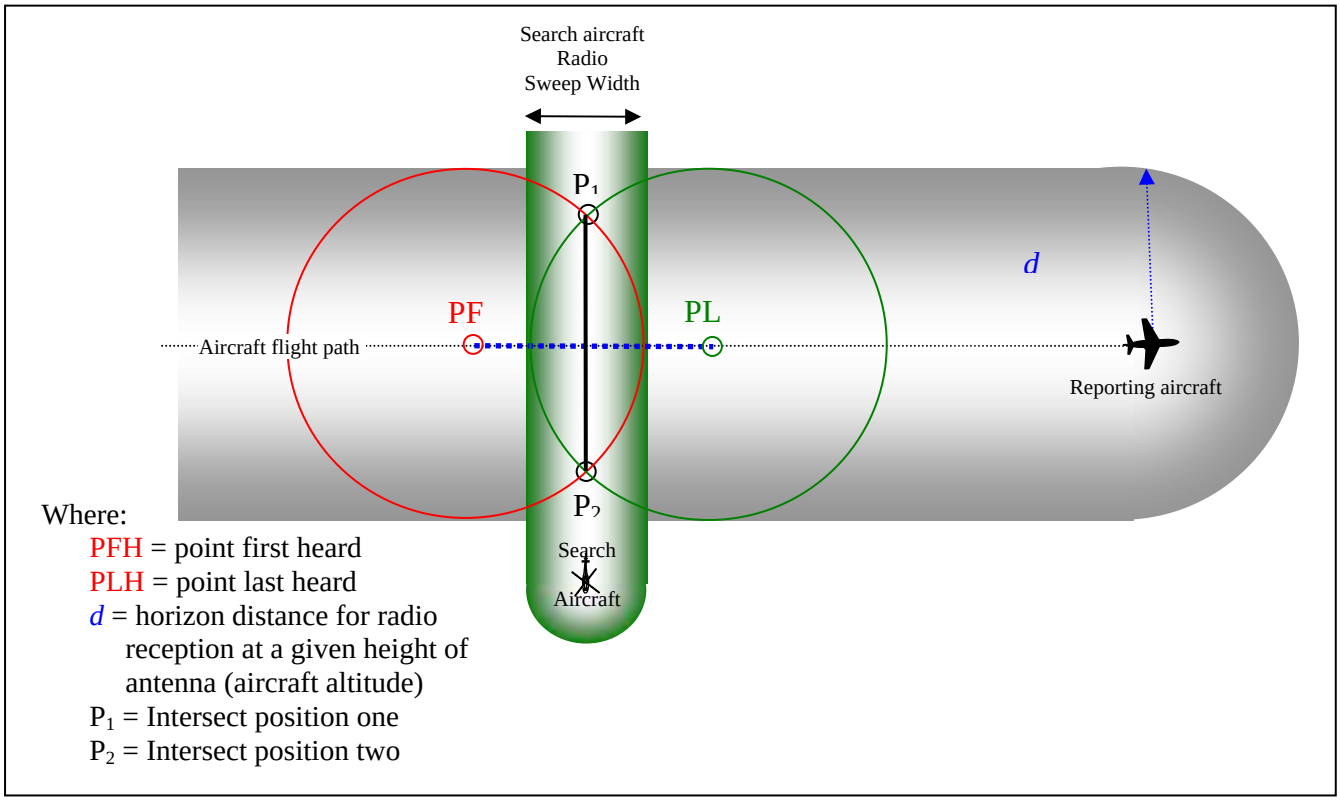



**Figure 9 Searching the intersect line by search aircraft at lower altitude than the reporting aircraft.**

10. **Visual search.** If no beacon signal is detected either by the search aircraft conducting an electronic search or by other high-flying aircraft, then only rarely will a visual search be possible based on a single report.

    a. A visual search may be conducted when the original report comes from a low-flying aircraft which narrows the possible search area significantly.

    b. When a visual search is conducted based on an audible 121.5 MHz beacon alert, the agency policies and procedures for searches on uncorrelated distress alerts should be followed.

11. **Determining Search Areas with Multiple Reports.** Multiple reports greatly simplify determining the probable location of a distress beacon. This situation is very similar to uncorrelated distress calls on VHF-FM and the reception by multiple towers (without DF).

    a. Use the methods provided above for plotting each of the reports.

    b. Then identify the areas of overlap and intersections of respective pairs of radio horizon rings as possible locations and eliminate those areas not covered by the multiple reports.

    c. Figure 10 shows an example plot of two aircraft reports and resulting intersecting reception range rings.

        (1) Hifly is at 30,000 feet and on a course of 060 deg T.

        (2) Hifly2 is initially at 20,000 feet and descending, the point last heard is at 10,000 feet. Hifly2 is on a course of 242 deg T.

    d. The smaller search area presented in this case would greatly reduce the search time needed for an electronic search and likely result in a reasonable visual search.

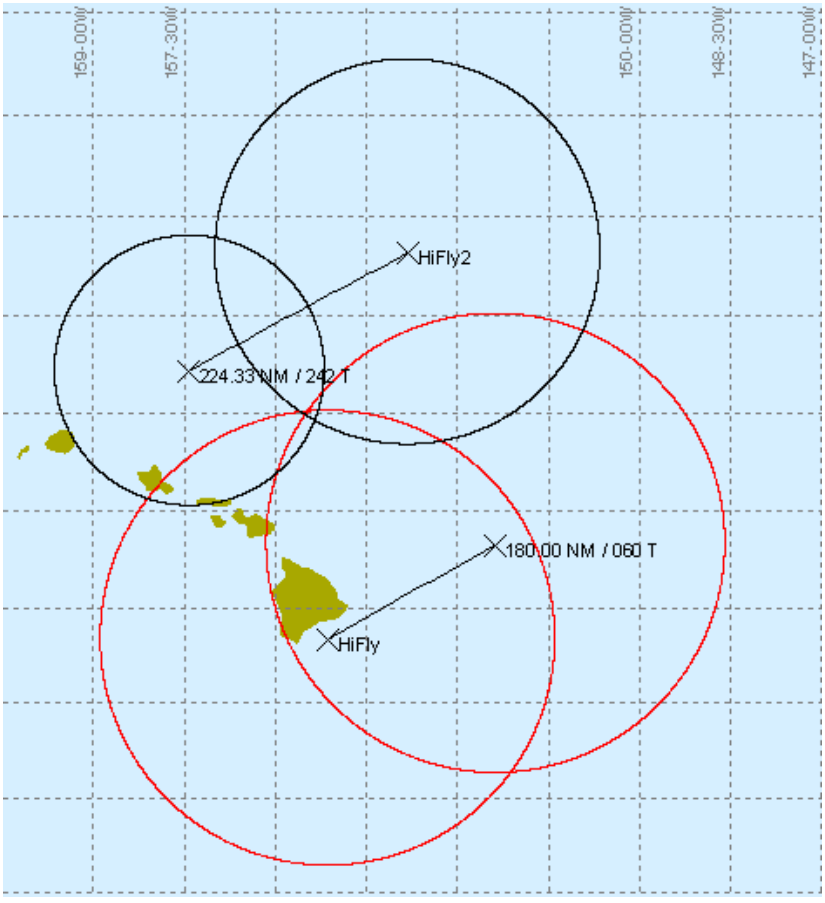


**Figure 10 Plot of PFH, PLH and respective radio horizon range circles; Hifly at 30,000 feet and course of 060 deg T; Hifly2 at 20,000 feet and descending to 10,000 feet and course of 242 deg T.**

***CAUTIONS and NOTES:***

1. **Reports of first heard and last heard may not be accurate.** The people monitoring the radio may not immediately hear or recognize the 121.5 MHz distress beacon swept tone. Both the time and location may be in error.

   a. The beacon may have started transmitting after the high-flying aircraft was already well within the maximum detection range. The beacon may cease transmitting well before the aircraft is beyond the maximum detection range. Or both events could occur. An effort should be made to determine whether the signal seemed strong when first acquired and then faded, or was getting stronger and then abruptly ceased, or started suddenly, stopped suddenly, and seemed to be about the same strength the whole time it was heard. In either of the cases, the given procedure should still work, although the area of the intersection of the two circles will be enlarged as the result of their centers being closer together than they would be if signal acquisition and loss were due solely to the aircraft coming within maximum detection range and then moving beyond maximum detection range while the beacon was transmitting.

b. As a part of the report data gathering process it should also be ascertained that the receiving radio was already on (not turned on and the signal was there) and that adjustments to the squelch were not made (squelch turned down and the signal was there). These situations may occur when seeking additional reports aircraft are alerted to listen and they adjust their radios. In those cases, the initial position they provide may not be useful, but the position for the last heard point could be used and added to the knowledge from previous reports.

2. **Reports from a single aircraft may occur at different altitudes or courses.** Aircraft, particularly those under instrument flight rules may be ascending, descending and/or changing course according to their flight plan and air route traffic control needs. The consequence is that in some instances the first heard and last heard reports could be from different altitudes or on different courses. The course change is not all that significant as the heard distance will remain the distance between first heard and last heard. Knowing the turn point in this case could be helpful as it allows drawing another range circle which can be combined with the first heard and last heard generated range circles to more narrowly define the area. When the reports occur at different altitudes the appropriate range circles for each need to be drawn to discover the intersect points.

3. **The sending antenna may have some height above sea level.** The calculations above ignored the obvious likelihood that the EPIRB or ELT transmitting the 121.5 MHz alert may not be sitting on the surface, but may be anywhere from a couple of feet up to tens of feet above the ground. The height of the sending antenna should be considered and the distance added to the reception range. We will not address the “what if” situation for an aircraft flying with an active beacon.

4. **The Hawaii example case notes.**

   a. In the illustration, the entire island of Hawaii is included in the intersection of the two circles and should be considered as a possible location of a forced landing site.

   b. If an aircraft experienced a forced landing on Hawaii, the first heard and last heard positions may be affected by the forced landing site's altitude (which could be quite high) and the terrain surrounding the site, which could block the signal in some directions.

   c. These same factors should be considered in any case where the radio horizon range circle crosses land, particularly with high terrain.

# AGENDA ITEM 5: CONSIDER PROBLEMS AND MAKE SPECIFIC RECOMMENDATIONS CONCERNING THE PROVISION OF ATM/AIS/SAR IN THE ASIA/PACIFIC REGION

**Agenda Item 5: Consider problems and make specific recommendations concerning the provision of ATM/AIS/SAR in the Asia/Pacific Region**

**45th Conference of Directors General of Civil Aviation Asia and Pacific Regions**

5.1 The meeting was informed of the outcomes of the 45th Conference of Directors General of Civil Aviation (DGCAs), Asia and Pacific Region which was hosted by the Department of Civil Aviation, Malaysia and was held in Kuala Lumpur, Malaysia during November 2008. The Conference was attended by 228 delegates from 34 States/Administrations and 5 International Organizations. The meeting reviewed the action items agreed to by the DGCA/45 relating to the work programme of the Sub-Group in the fields of ATM/AIS/SAR, noting relevant Action Items as follows:

| | |
|---|---|
| Action Item 45/2 | Regional workshop on environmental protection |
| Action Item 45/3 | Development of ADS-B regulations, guidance material |

5.2 The Sub-Group urged States to review and comply with the overall Recommendations from the 45th DGCAs Conference.

**Approval of ANP Amendment APAC 09/5-ATS**

5.3 Under the auspices of the Bay of Bengal ATS Coordination Group (BBACG) and the Arabian Sea Indian Ocean ATS Coordination Group (ASIOACG), the Regional Office has assisted a number of Bay of Bengal and Indian Ocean States to formulate a suitable ANP amendment proposal to designate a number of conventional oceanic routes as RNAV routes over a widespread area of the Indian Ocean. Noting that, in some cases, these route changes will also have an impact on the MID and AFI ANPs, the Regional Office has conducted significant coordination with the Cairo and Nairobi Regional Offices of ICAO to ensure that complementary amendments to the respective ANPs are progressed.

5.4 Approval of the amendment proposal had recently been received from ICAO HQ, as shown in **Appendix A** to the report on Agenda Item 5. In order to arrange a synchronized implementation of the new ATS routes a side meeting was held, comprising representatives from Australia, India, Indonesia, Malaysia, Maldives, Sri Lanka. Although unable to attend the side meeting Thailand provided input and will participate in the agreed implementation plan.

5.5 Australia undertook to draft the body text of a model AIP SUP, and to circulate the text to all affected APAC States prior to 31 July 2009 for comment. Each state will then prepare SUPs that include the route changes to the Basic ANP which affect their respective FIR. The AIP SUPs will be published by all affected States on 10 September 2009, 2 AIRAC cycles prior to the effective date 19 November 2009. Contact details have been provided by each State and Australia will coordinate the arrangements via email. ICAO Bangkok Regional Office will be included in all correspondence to enable coordination with Nairobi and Cairo Regional Offices.

5.6 India provided written advice of amendments already promulgated and a detailed plan for future promulgation in September 2009 to become effective on 19 November 2009. India will also participate in the implementation plan.

**SSR Code Allocation – EUR & MID Regions**

5.7 At the request of the European Air Navigation Planning Group (EANPG), the SSR Code Management Plan (CMP) for the ICAO European (EUR) Region had been developed by the EUROCONTROL Originating Region Code Assignment Method (ORCAM) SSR Code Steering Group (SCSG). The agreed allocation of SSR codes to States and ATC units, as well as the principles and associated procedures, are shown in the EUR Regional Air Navigation Plan – Facilities and Services Implementation Document (FASID), Part IV Communications, Navigation and Surveillance (CNS) – Supplement SSR Code Allocation List for the EUR Region, Part A The detailed listing of codes, serving both international and national purposes, is shown in Part B.

5.8 ICAO provides that, whenever there is a need for individual aircraft identification, each aircraft shall be assigned a discrete code which should, whenever possible, be retained throughout the flight (PANS-ATM, Chapter 8, paragraph 8.5.2.2.7). ICAO also provides that codes shall be allocated to States in accordance with regional air navigation agreements taking into account overlapping radar coverage over adjacent airspace (PANS-ATM, Chapter 8, paragraph 8.5.2.2.1).

5.9 Except for aircraft in state of emergency, or during communication failure or unlawful interference situations, and unless otherwise agreed by regional air navigation agreement or between a transferring and an accepting ATC unit, the transferring unit shall assign Code 2000 to a controlled flight prior transfer of communications (PANS-ATM, Chapter 8, paragraph 8.5.2.2.8).

5.10 Various studies indicate that Aircraft Identification (ACID) down linked from the aircraft (Mode S or ADS B) will not solve the SSR code shortage in the foreseeable future. Due to the limited number of discrete codes available and very high (short haul) traffic in Europe, the allocation of codes in the EUR region is based on ten Participating Areas (PA) which have been determined on the basis of the flow of air traffic in the region. A code change is required at the time an aircraft crosses a PA boundary unless special provision has been made for retention beyond the PA boundary.

5.11 As the adjacent ICAO Regions have been using all codes along the boundaries of EUR Region, the ORCAM Secretariat identified a very high number of code conflicts at the interface between EUR Region and MID Region and EUR Region and areas of the APAC Region.

5.12 Code conflict problems at the interface with other ICAO regions were discussed during the Second and Third Inter-Regional Coordination Meetings between APAC, EUR/NAT and MID Regional Offices (IRCM/2, Paris, France, September 2006 and IRCM/3, Cairo, Egypt, March 2009) and agreement was reached that inter-regional coordination of SSR code allocation was an issue that needed urgent attention.

5.13 Full application of ICAO provision, PANS-ATM, Chapter 8, paragraph 8.5.2.2.8 is very important in order to avoid code conflicts at the interface with between different ICAO regions. The Sub-Group learned that 4 of the EUR Region Participating Areas border with the APAC Region and, similar to the coordination with MID Region, coordination with APAC Region needs urgent attention in order to build an effective interface between the two Regions. The meeting agreed to the following draft Conclusion in this respect:

**Draft Conclusion SG19/10 – SSR Code Coordination with ORCAM Secretariat**

That, recognizing that four of the ten European (EUR) region SSR code Participating Areas border Asian States, the Regional Office facilitate coordination with the European Originating Region Code Assignment Method (ORCAM) Secretariat to implement code management arrangements that avoid SSR code conflicts at the EUR/ASIA interface.

**Bay of Bengal ATFM Update – BOBCAT Activities**

5.14 Thailand provided a comprehensive update of the status of Air Traffic Flow Management procedures across the Bay of Bengal and South Asia. Throughout the 23 months since operational implementation of the ATFM procedures on AIRAC 5 July 2007 and 5 June 2009, 37,264 westbound aircraft submitted slot request to enter the Kabul FIR, with 94 percent (34,977 aircraft) accepting slot allocation. This represents an average annual traffic demand of 19,403 aircraft. Aircraft not accepting a slot allocation may have had various reasons such as delay factor, route availability and sometimes weather which allowed a more efficient and cost-effective route outside the Kabul FIR.

5.15 The meeting noted that the percentage of flights transiting the Kabul FIR at a same or higher preferred flight level according to collected ATFM data fluctuates between 81.75% in April 2009 and 88.61% in March 2009, while in some days as high as 98.08% of aircraft were able to transit the Kabul FIR at a same or higher preferred flight level.

*Early and Late Departures*

5.16 The Sub-Group noted from analysis of ATFM data collection, aircraft departure punctuality is a crucial cause of aircraft transiting the Kabul FIR at a flight level lower than slot allocation. The meeting learned that, within the January – April 2009 data collection, the early or late departure of the aircraft itself, or of another aircraft, was responsible for approximately 44 percent of the aircraft which transited the Kabul FIR at flight level lower than slot allocation, as shown in **Figure 1** below. As traffic increases, it is likely that cases of early and late departures in respect to Allocated Wheels-Up Time (AWUT) would have increased negative impact on the overall performance of the system, with the overall effect that everyone pays more for the lack of compliance by a few.

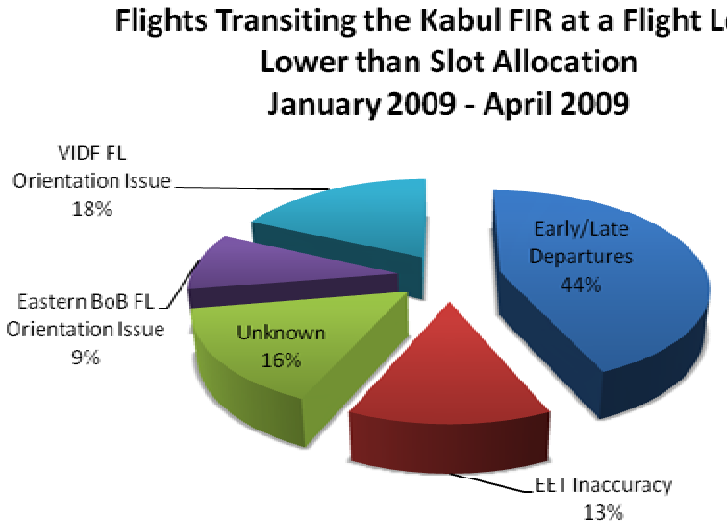


**Figure 1:** Flights Transiting the Kabul FIR at a Flight Level Lower than Slot Allocation (January 2009 - April 2009)

5.17 The statistics of aircraft analyzed to have potentially caused other aircraft to transit the Kabul FIR at flight level lower than slot allocation are shown in **Figure 2** and **Figure 3** below, organized by airline and departure airport, respectively.

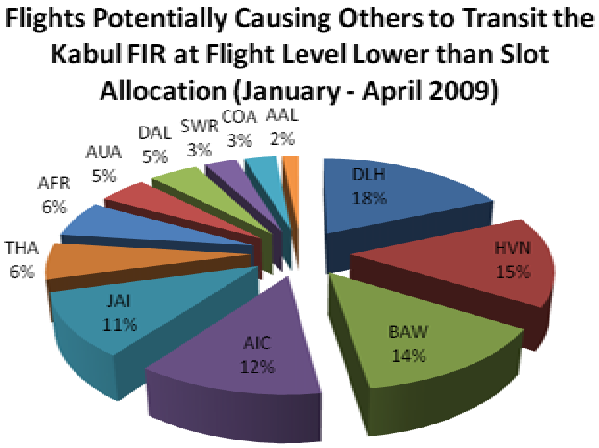



**Figure 2:** Flights Potentially Causing Others to Transit the Kabul FIR at a Flight Level Lower than Slot Allocation (January 2009 – April 2009) Organized by Airline Operator

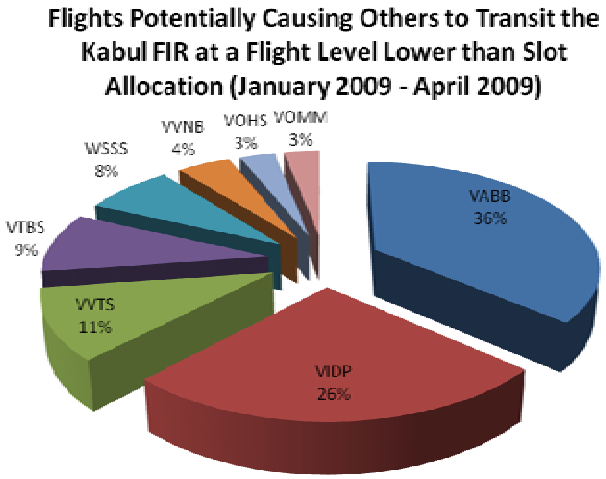



**Figure 3:** Flights Potentially Causing Others to Transit the Kabul FIR at a Flight Level Lower than Slot Allocation (January 2009 – April 2009) Organized by Departure Airport

5.18 The Sub-Group realized that the early/late departure problem was the major challenge to be addressed as it would immediately increase the efficiency of the ATFM procedures. Recognizing that both ANSPs and Airlines had responsibilities in addressing this challenge, the

meeting sought to ensure that the airlines and airports identified in the ATFM data analysis were appraised of their specific circumstances and requested to take steps to improve their performance in this area. The meeting agreed to the following draft Conclusion in this regard:

**Draft Conclusion SG19/11 – ATFM Compliance-Advice to Airlines and Airports**

That, on behalf of the ATFM/TF, the Regional Office seeks assistance in complying with ATFM procedures from the specific airlines and airports identified by the ATFM/TF as contributing to poor ATFM performance because of early or late departure.

*Operational Trial of the Bypass Procedure for L759 using M770*

5.19 The meeting was advised of the bypass procedure utilizing M770 that has been successfully put on operational trial since 18 December 2008, to alleviate traffic bunching on L759. Despite the low number of flights using the bypass route, the procedure proved to be very effective in alleviating the bunching of traffic which would be more in evidence in a heavier traffic scenario. Thailand thanked India, Myanmar and the ATFM Task Force in supporting the trial.

5.20 The meeting requested the States concerned to continue discussions with the objective of making the bypass procedure permanent. Agreement was reached that India and Thailand would coordinate with Myanmar and Pakistan over the next few weeks with a view to establishing more permanent arrangements from the expiry of the current trial NOTAMS in August.

*ATFM/TF honoured with ATCA Industrial Award*

5.21 The Sub-Group was pleased to be informed that the United States Air Traffic Control Association (US ATCA) honoured the Air Traffic Flow Management Task Force (ATFM/TF) with the 2008 ATCA Industrial Award, as shown in **Appendix B** to the Report on Agenda Item 5, during the November 2008 ATCA Conference. The ATCA Industrial Award is a medallion given to an industry or group of industries for an outstanding achievement or contribution which has added to the quality, safety or efficiency of air traffic control.

5.22 In order to recognize the work of the core States and Organisations involved in sorting the ATFM/BOBCAT traffic each night, AEROTHAI has organized replicas of the ATCA Industrial Award to be presented to the Core States, ICAO Asia-Pacific Regional Office and IATA Asia-Pacific Regional Office. Following coordination with US ATCA, it has been confirmed that, the President of US ATCA, Mr. Peter F. Dumont, will be available to present the replicas as part of the activities of the ICAO Asia-Pacific Regional Office 60th Anniversary celebrations, to be held at the Regional Office on 14 July 2009.

5.23 Accordingly, the Regional Office would be grateful if suitable representatives from Afghanistan, Pakistan, India, Myanmar, Malaysia, Singapore and IATA Singapore could be in attendance at the ICAO Asia-Pacific Regional Office 60th Anniversary Seminar on *"Socio-Economic Dynamics of Civil Aviation in the Asia and Pacific Region"* on 14 July 2009, in order to receive the replicas from the President of US ATCA.

5.24 IATA led the meeting in congratulating the ATFM/TF on these outcomes. IATA thanked Thailand and AEROTHAI for the excellent work in designing the system, and in hosting and running the ATFMU at the AEROTHAI premises in Bangkok. IATA also thanked ICAO for their leadership in this undertaking and all the States involved, in particular India and Pakistan, who had to continuously ensure conformity by flights with the slots allocated.

5.25 IATA expressed that the ATFM system will continue to deliver benefits for a long time to come, and is a fine example of what can be achieved by a group of States committed to working with organizations in providing collaborative solutions with a regional perspective. In IATA's view, this should be emulated and the ATCA award to the ATFM TF is very well deserved.

**ATFM Seminar/Workshop (7-9 October 2008, Fukuoka, Japan)**

5.26 APANPIRG/18 (September 2007) adopted Conclusion 18/7 for the conduct of a regional ATFM Seminar in 2008. Recognizing that the ATFM Seminar called for by APANPIRG/18 provided a good opportunity to influence regional ATFM planning, the Regional Office elected to include a 'Workshop' component to allow for opportunity for recommendations to come forward. APANPIRG/19 (September 2008) noted that such a workshop would be tasked with identifying and recommending appropriate regional objectives, for example:

- Development of a high level ATFM Concept of Operations for the Region;
- Enhancement of the draft ATFM Communications Manual;
- Develop mechanisms for data gathering, collation and sharing; and
- Review activities of the Bay of Bengal ATFM Task Force.

5.27 The meeting reviewed the formal outputs of the ATFM Seminar/Workshop, which was hosted by JCAB in Fukuoka, Japan during October 2008. The outputs of the ATFM Workshop were presented as a series of 6 Outcomes and 5 Recommendations and, based on these, the Sub-Group agreed to the following draft Conclusions:

**Draft Conclusion SG19/12 – ATFM Steering Group and Concept of Operations**

That a regional ATFM Steering Group be constituted and tasked with preparing an Asia/Pacific Regional ATFM Concept of Operations based on analysis of regional data and traffic flows. The ATFM Steering Group should consider the outcomes and recommendations from the October 2008 ATFM Seminar/Workshop (Fukuoka, Japan) as guidance in deriving its Terms of Reference.

**Draft Conclusion SG19/13 – Adopt ATFM Communications Manual**

That, the *Air Traffic Flow Management (ATFM) Communications Handbook for the Asia/Pacific Region*, as shown in **Appendix C** to the ATM/AIS/SAR/SG/19 Report on Agenda Item 5, be adopted and circulated as regional guidance material.

**CAR/SAM Air Traffic Flow Management (ATFM) Regional Project for Latin America**

5.28 Presented by the United States, this paper identified the activities and accomplishments of the ICAO ATFM Regional Project for Latin America. This work correlates with the outcomes and recommendations of the ATFM Seminar/Workshop held in Fukuoka, Japan and includes requirements to identify and recommend appropriate regional objectives such as: development of a high level ATFM Concept of Operations for the Region, enhancement of draft ATFM Manuals and the development of mechanisms for data gathering, and sharing.

5.29 The Sub-Group considered that the lessons already available from the Latin American ATFM project could be of assistance to the Asia/Pacific region and the draft ATFM Roadmap and draft ATFM Manual would very usefully serve as the basis for the development of similar documents

for the region. The Sub-Group agreed that the ATFM Survey Questionnaire that had been prepared for the Latin American ATFM project would be valuable in obtaining an indication of the current status of ATFM in the region and formulated the following Conclusion:

**Draft Conclusion SG19/14 – Conduct ATFM Survey**

That, a survey of Asia Pacific States be conducted, based on the questionnaire at **Appendix D** to the ATM/AIS/SAR/SG/19 Report on Agenda Item 5, with the objective of benchmarking the current status of Air Traffic Flow Management (ATFM) activities in the region.

**Traffic Movements and GNE Reports June 2008 to May 2009 on the Six Designated Monitored Areas in the South China Sea**

5.30 The meeting was pleased to note from the report from Singapore, as the Monitoring Authority, that there were no lateral or longitudinal errors reported on all the six RNAV routes in the South China Sea between June 2008 and May 2009. In the context of the high traffic volumes recorded by the Monitoring Authority, this was highly commendable and the superior navigation performance demonstrated gave strong encouragement for the implementation of the RNP 10 and RNP 4 routes planned for this airspace.

**Establishment of Southeast Asia Route Review Task Force (SEA RR/TF)**

5.31 IATA presented a proposal to create a specific ICAO focus group to review and modernise the ATM arrangements in the Southeast Asia and Northeast Asia area reflecting the modern technological capabilities becoming available. The focus group should analyse and implement appropriate measures, where environmental and efficiency benefits could be positively enhanced using the ICAO Regional and State Performance Framework methodology.

5.32 ICAO recognises the importance of the Southeast Asia/Northeast Asia regions by identifying it as a major traffic flow (AR9) in the regional air navigation plan and IATA informed the meeting that 22 of the 40 busiest airports in Asia/Pacific region (excluding West Coast USA) lie within this traffic flow. It is also an extremely complicated piece of airspace with 21 FIRs interfacing.

5.33 IATA commented that a number of ICAO sub-groups share the responsibility for ATM issues within this region such as SEACG, RNP-SEA/TF, WPAC/SCS RSG, etc. in addition to some informal (i.e. non-ICAO) groups such as IPACG, East Asia ATM Coordination Group, etc. While these groups have delivered significant operational improvements, they are largely focused on separate smaller portions within the larger SEA/ NEA area. IATA believes that it is timely now to establish a focus group to review regional ATM arrangements within the overall SEA/ NEA area. Such a group would to build on the progress already achieved and establish harmonized arrangements that take full advantage of the substantial infrastructure investments (e.g. ADS-B, ADS-C, automated ATM systems) that are presently being made by States as well as incorporating contemporary ICAO requirements such as en-route PBN.

5.34 The IATA proposal formed the basis of an extensive discussion by the meeting. In this context, the Secretariat summarized the applicable provisions, drawing the attention of the meeting to the Assembly Resolution calling for the urgent implementation of PBN, numerous Global Planning Initiatives (GPIs) relating to PBN implementation contained in the Global Plan, the APANPIRG initiatives in terms of regional preference objectives and the need to consider user expectations – supported by the comments from the ANC in this respect, the APANPIRG Key Priority List calling for RNP/RNAV implementation and the route implementations already included as tasks on the Sub-Group Task List. Arising from the APANPIRG/19 (September 2008) report, the

Secretariat had conducted an analysis of the regional work programme against the user expectations submitted by IATA. As discussed in Agenda Item 3, the analysis highlighted that a single 'gap' existed, in that although IATA's users expectations called for a review of the Southeast Asia/Northeast Asia route structure there was no corresponding activity taking place on the regional work programme.

5.35 The States of Southeast Asia generally expressed in-principle support for the proposal. However, the States of Northeast Asia expressed reservations about establishing such a large working group for this purpose, and considered that the focus of the group covered too many different aspects. Hong Kong, China also questioned whether the gap could not be filled by creating a Northeast Asia ATS Coordination Group analogous to SEACG. China asked if the required result could actually be achieved by creating such a new group.

5.36 Ultimately, agreement was reached to proceed with a single prime task – an ATS route review – in the Western Pacific/South China Sea airspace generally to the south of the Fukuoka FIR boundary. Agreeing with the Secretary that as resources were becoming available because of the Sub-Group decision to recommend dissolution of the WPAC/SCS RSG, and noting that the RNP-SEA/TF was presently inactive, the meeting took the step of re-naming and re-tasking the RNP-SEA/TF to undertake this work. Accordingly, the Sub-Group agreed to suitable Terms of Reference for the Southeast Asia Route Review Task Force (SEA RR/TF) which would report to the Sub-Group and agreed to the following Decision:

**ATM/AIS/SAR Sub-Group Decision 19/1 – Establish Southeast Asia Route Review Task Force (SEA RR/TF)**

That the RNP-SEA/TF be renamed as the Southeast Asia Route Review Task Force (SEA RR/TF) and re-tasked in accordance with the Terms of Reference shown at **Appendix E** to the ATM/AIS/SAR/SG/19 Report of Agenda Item 5. The SEA RR/TF will report to the ATM/AIS/SAR Sub-Group of APANPIRG.

**Develop Global Oceanic and Remote Interface Control Document (ICD)**

5.37 The United States informed the meeting that a variety of differing AIDC ICD provisions were in effect globally and this added complexity and expense in configuring automated systems to communicate with each other. However, the benefits from AIDC were well documented and both the North Atlantic (NAT) Region and the Asia/Pacific region had independently recognized the benefits of AIDC in reducing the instances of ATC Unit-to-ATC Unit coordination error with resulting reductions in RVSM large height deviations.

5.38 The United States briefed on a proposal to create a Global Oceanic and Remote Interface Control Document (ICD) as recommended to the NAT IMG by the NAT AIDC Task Force. The standardization of the messages from the ICAO coordination protocol, as documented in Doc. 4444, into a Global Oceanic and Remote AIDC ICD document was proposed, with the first step being to harmonize the NAT and Asia Pacific ICDs. The United States had already reached agreement within the NAT Region that a common AIDC ICD would achieve benefits and, if the Asia/Pacific region was agreeable, would undertake the necessary work and coordination to draft a global AIDC ICD.

5.39 The meeting recognized the benefits that would accrue from a common ICD and thanked the United States for agreeing to undertake this work. The meeting requested that the Regional Office take coordination responsibility for the project, agreeing to the following draft Conclusion:

**Draft Conclusion SG19/15 – Support for Global ICD for AFTN AIDC**

That, recognizing the benefits to be gained from globally harmonized interface arrangements for AIDC, APANPIRG supports the work being undertaken by the United States to coordinate a global ICD for AFTN AIDC and invites the Asia/Pacific Regional Office to act as the regional point of contact for this work.

**Third Interregional Coordination Meeting on Interface Issues between APAC, ESAF, EUR/NAT, and MID Regional offices**

5.40 The Third Inter-Regional Co-ordination Meeting (IRCM/3) on Interface Issues between the Asia/Pacific (APAC), Eastern and Southern African (ESAF), European and North Atlantic (EUR/NAT) and Middle East (MID) Regional Offices of ICAO was held at the Middle East Office in Cairo, Egypt from 24 to 26 March 2009. The IRCM/3 meeting developed a total of 19 interface issue Actions for initiation by the ICAO Regional Offices and/or follow-up by ICAO Headquarters in support to the ICAO Strategic Objectives.

International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Ref.: T 3/09.5 – AP082/09 (ATM) 02 June 2009

**Subject**: Approval of Proposal for Amendment of the ICAO ASIA/PAC Air Navigation Plan (Doc 9673), Volume I, Basic ANP (Serial No. APAC 09/5–ATS)

Sir/Madam,

I have the honour to inform you that the President, on behalf of the Council, approved on 29 May 2009 the attached proposal for amendment of the ICAO ASIA/PAC Air Navigation Plan (Doc 9673).

The approved amendment will be incorporated in the next consolidated amendment to be issued to the ICAO ASIA/PAC Air Navigation Plan.

Accept, Sir/Madam, the assurances of my highest consideration.

Mokhtar A. Awan
Regional Director

**Enclosure:**
Proposal for Amendment of *ICAO ASIA/PAC Basic Air Navigation Plan* (Serial No. APAC 09/5–ATS)

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**ICAO Air Navigation Plan Amendment Proposal**

**Proposal for Amendment of Basic Air Navigation Plan**
**(Serial No. APAC 09/5-ATS)**

a) **Plan:** ASIA/PAC, Basic ANP (Doc. 9673)

*(**Note**: complementary amendments to the MID and AFI ANPs are required in some cases, as highlighted below)*

b) **Proposed Amendment:** Editorial note: Amendments are arranged to show deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

**ADD** the following ATS routes:

L774 (PLAISANCE)
LELED 1116.5S 07500.0E
ELATI 0200.0S 08957.7E
KETIV 0042.0S 09200.0E
MEDAN
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

L894 KITAL 2003.0N 06018.0E
MALE
SUNAN 0028.7S 07800.0E
DADAR 0200.0S 07927.1E
PERTH
(cf. Table ATS 1, Charts ATS 3A and D)
(**Note**: Replaces R456 IZKI-MALE and A594 MALE-PERTH)

M641 MADURAI
BIKOK 0817.0N 07836.0E
COLOMBO
COCOS IS
PERTH
(cf. Table ATS 1, Chart ATS 3D)

N509 ELATI 0200.0S 08957.7E
PORT HEDLAND
(cf. Table ATS 1, Chart ATS 3D)

N628 PEKANBARU
BUSUX 0355.0S 06000.0E
(PRASLIN)
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

N633 KUALA LUMPUR
PEKANBARU
POSOD 0329.5S 09409.9E
PEDPI 1316.6S 07500.0E
(PLAISANCE)
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

N640 TRIVANDRUM
BIKOK 0817.0N 07836.0E
COLOMBO
LEARMONTH
MOUNT HOPE
ADELAIDE
(cf. Table ATS 1, Chart ATS 3D)

P627 PHUKET
KADAP 0200.0S 08409.6E
KALBI 0852.3S 07500.0E
(PLAISANCE)
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

P751 (ADEN)
ANGAL 1614N 06000E
MUMBAI
(cf. Table ATS 1, Charts ATS 3A and D)
(**Note**: Amendment to MID BANP also required)

P756 MALE
MEDAN
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Replaces R456 MALE-MABIX)

L516 KITAL 2003.0N 06018.0E
ELKEL 0149.0N 06911.0E
(DIEGO GARCIA)
(cf. Table ATS 1, Chart ATS 3A, 3D)
(**Note**: Replaces ATS route A452 and realigned)

L899 HANIMAADHOO
TRIVANDRUM
(cf. Table ATS 1, Chart ATS 3D)

M766 COLOMBO
JAKARTA
INDRAMAYU
MADIN 0617.9S 11023.0E
CUCUT 0617.7S 11106.0E
SURABAYA
BALI
DARWIN
(cf. Table ATS 1, Chart ATS 3D)

**DELETE** requirement for ATS routes:

~~A209 ELATI 0200.0S 08957.7E~~
~~PORT HEDLAND~~
(cf. Table ATS 1, Chart ATS 3D)

~~A214 PEKANBARU~~
~~BUSUX 0355.0S 06000.0E~~
~~(PRASLIN)~~
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

~~A327 PHUKET~~
~~KADAP 0200.0S 08409.6E~~
~~KALBI 0852.3S 07500.0E~~
~~(PLAISANCE)~~
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

~~A451 (ADEN)~~
~~ANGAL 1614N 06000E~~
~~MUMBAI~~
(cf. Table ATS 1, Charts ATS 3A, 3D)
(**Note**: Amendment to MID BANP also required)

~~A452 GOLEM 1157.6N 06722.2E~~
~~ELKEL 0149.0N 06911.0E~~
~~(DIEGO GARCIA)~~
(cf. Table ATS 1, Chart ATS 3D)

~~A463 MADURAI~~
~~BIKOK 0817.0N 07836.0E~~
~~COLOMBO~~
~~COCOS IS~~
~~PERTH~~
(cf. Table ATS 1, Chart ATS 3D)

~~A594 MALE~~
~~SUNAN 0028.7S 07800.0E~~
~~DADAR 0200.0S 07927.1E~~
~~PERTH~~
(**Note**: Replaced by ATS (RNAV) routes L516 and L894)
(cf. Table ATS 1, Chart ATS 3D)

~~B335 KUALA LUMPUR~~
~~PEKANBARU~~
~~POSOD 0329.5S 09409.9E~~
~~PEDPI 1316.6S 07500.0E~~
~~(PLAISANCE)~~
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

~~B340 TRIVANDRUM~~
~~BIKOK 0817.0N 07836.0E~~
~~COLOMBO~~
~~LEARMONTH~~
~~MOUNT HOPE~~
~~ADELAIDE~~
(cf. Table ATS 1, Chart ATS 3D)

~~B344 (PLAISANCE)~~
~~LELED 1116.5S 07500.0E~~
~~ELATI 0200.0S 08957.7E~~
~~KETIV 0042.0S 09200.0E~~
~~MEDAN~~
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: Amendment to AFI BANP also required)

~~G462 COLOMBO~~
~~JAKARTA~~
~~INDRAMAYU~~
~~MADIN 0617.9S 11023.0E~~
~~CUCUT 0617.7S 11106.0E~~
~~SURABAYA~~
~~BALI~~
~~DARWIN~~
(cf. Table ATS 1, Chart ATS 3D)

~~R456 (IZKI)~~
~~BOTAN 2006.6N 06021.8E~~
~~MALE~~
~~MABIX 0315.0N 09454.0E~~
(cf. Table ATS 1, Chart ATS 3D)
(**Note**: IZKI-MALE replaced by ATS route L894 and MALE-MABIX replaced by P756)

c) **Originated by:** Australia, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand

d) **Reasons of the originator for the amendment:** The primary users of the ATS routes identified in this amendment proposal are long-haul RNP compliant aircraft. Redesignation of 'conventional' routes as ATS (RNAV) routes will enable transition to RNP based separation minima in the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444) in line with ICAO PBN Concept
The proposal was finalised and recommended by the Arabian Sea/Indian Ocean ATS Coordination Group and Bay of Bengal ATS Coordination Group meetings conducted in Malé, Maldives during January 2009 (ASIOACG/4 & BBACG/20, 25-29 January 2009)

| | | |
|---|---|---|
| e) | **Proposed date for implementation:** | Immediately upon approval by the Council, target date AIRAC 19 November 2009 |
| f) | **Proposal circulated to the following States/Territories and Organizations:** | Australia*, Bahrain, India*, Indonesia*, Madagascar, Malaysia*, Maldives*, Mauritius, Myanmar, Oman, Qatar, Saudi Arabia, Seychelles, Singapore, Sri Lanka*, Thailand*, United Arab Emirates and IATA<br><br>* for information |
| g) | **Comments of the Secretariat**: | This amendment proposal has been facilitated by the Asia/Pacific Secretariat as an enabling activity for the implementation of RNP 10 based 50 NM/50 NM reduced horizontal separation standards in accordance with ICAO PBN Concept and requirements of the APANPIRG Regional PBN Implementation Plan.<br><br>The proposal is supported by the Asia/Pacific Regional Office. |

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AIR TRAFFIC CONTROL ASSOCIATION
AWARD OF MERIT
AIR TRAFFIC CONTROL ASSOCIATION
INDUSTRIAL AWARD
PRESENTED TO AN INDUSTRY LEADER
FOR OUTSTANDING ACHIEVEMENT
THAT HAS ADDED TO THE QUALITY
SAFETY OR EFFICIENCY OF AIR TRAFFIC CONTROL
Awarded to
Asia-Pacific Air Traffic Flow
Management Task Force
Bangkok, Thailand
November 2008

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**
**ASIA AND PACIFIC OFFICE**


# *DRAFT*

# AIR TRAFFIC FLOW MANAGEMENT (ATFM) COMMUNICATIONS HANDBOOK FOR THE ASIA PACIFIC REGION

*Version 0.2 – November 2008*

Issued by the ICAO Asia/Pacific Regional Office, Bangkok

## FOREWORD

Centralized air traffic flow management (ATFM) providers are best able to communicate the capacity of their national airspace systems to accept traffic from adjacent international air traffic service (ATS) providers. As coordination and collaboration efforts to balance traffic demand and airspace/airport capacity intensify between affected States, common ATFM procedures and communication are essential. Once procedures are defined, a key element in removing language barriers is establishing common terms and phrases. Terminology and phraseology differences in the operational application of ATFM procedures could be a potential source of confusion during communications, both written and verbal, between international ATFM units.

Common terminology is an essential element in exchanging definitive, clear, and concise communication between international ATFM units. Likewise, the phraseology should follow a technical pattern for the exchange of standardized and harmonized messages. This Asia/Pacific guidance material is intended to support States in meeting these objectives and has been adopted by APANPIRG/20, under the terms of Conclusion xx/Xx, for this purpose. As this is the first document of its kind for the region, APANPIRG noted that further development and amendment was likely. However, it is expected that the guidance herein will be equally applicable to both verbal ATFM coordination exchanges and as the basis for written ATFM messages. Although the terminologies and phraseologies presented herein are not intended to be a requirement for ATFM communications, they are recommended to States as guidelines for the exchange of ATFM messages.

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## 1. Introduction

1.1 ATFM is a function of air traffic management (ATM) established with the objective of contributing to a safe, orderly, and expeditious flow of traffic while minimizing delays. This is accomplished through the dynamic use of operational traffic management initiatives supported by continuous coordination and analysis.

1.2 The purpose of ATFM is to balance air traffic demand with airspace and/or airport capacity to ensure the most efficient use of the airspace system. This is achieved by ensuring that capacity is utilized to the maximum extent possible and that air traffic volumes are compatible with the capacities declared by the appropriate air navigation service providers.

1.3 ATFM implementation should provide for the organization and handling of the flow of air traffic in such a way that, while ensuring the safe, orderly and expeditious flight of individual aircraft, the totality of the traffic handled at any given point or in any given area is compatible with the capacity of the air traffic control system.

1.4 The operation of ATFM service includes the application of ATFM measures that are designed to achieve the optimum flow of traffic. These measures include, but are not limited to:

a) Allocating and updating departure slots;
b) Allocating and updating arrival slots;
c) Allocating and updating en-route slots;
d) Re-routing of traffic;
e) Alternate flight profiles;
f) Minutes-in-trail assignments;
g) Mile-in-trail assignments;
h) Airborne holding; and
i) Ground holding.

1.5 Inherent in the provision of an ATFM service is the necessity to coordinate arrangements clearly and accurately between ATC units. In most instances this is achieved via voice coordination between operatives in the respective units, however many occasions also require written messaging to support implementation of ATFM operational initiatives. Accordingly, efficient and effective written and verbal communication using standardized and documented terminologies and phraseologies is essential.

## 2. General

2.1 The primary goal of this guidance material is to promulgate appropriate terminologies and phraseologies for the exchange of written and verbal ATFM messages between units providing ATFM services, both within States and between States. The terminologies and phraseologies contained herein are intended to reflect the current use of plain language and provide a basis for regional standardization and harmonization.

2.2 Although there are various plain language words and phrases in use today by ATFM service providers, these words and phrases are all capable of being organized into a modular and structured method of delivery to ensure the harmonization of communications and reduce the incidence of misunderstanding between units providing ATFM services.

2.3 It is not the intent of these guidelines to provide detailed information on ATFM concepts, procedures, and initiatives; however, since not all readers may be familiar with ATFM terms used in the examples, a brief description of ATFM operational initiatives is provided at **Appendix 1**. The list is not all-inclusive and does not preclude the innovation and application of other procedures that will result in improved ATFM services.

## 3. Modular and Structured ATFM messages

3.1 The use of a modular and structured ATFM message provides for consistent ATFM message design and delivery. Each component of the ATFM message can contain plain language elements that, when combined, provide a complete ATFM message. Harmonization is achieved by the delivery of an ATFM message that has all of the required components in a structured format while making allowances for different plain language elements. This is of particular benefit for ATFM service providers that use different ATFM terminology or for non-native English speaking ATFM service providers.

3.2 This guidance material promulgates the concept of modular and structured ATFM messages as the basis for written and verbal ATFM coordination and defines an ATFM message in terms of five modules – the "Who", "What", "Where", "When" and "Why" of the ATFM communication. These five modules are described as follows:

a) **Who:** The ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact;

b) **What:** The ATFM objective to be achieved;

c) **Where:** The location of the ATFM objective to be achieved;

d) **When:** The time and/or duration of the ATFM objective to be achieved; and

e) **Why:** The reason for the ATFM objective.

3.3 There is no module regarding "How" the ATFM restrictions should be achieved by the counterpart ATFM service provider. This is because it is clearly the counterpart's responsibility "how" they fulfill the ATFM restrictions within their airspace. However, the ATC unit being asked

to implement ATFM restrictions may collaborate with the originating ATC unit on the type and method of ATFM measure to be applied.

3.4 Generally speaking, ATFM service providers should resolve demand-capacity related constraints by initiating local and/or national ATFM initiatives first. Hence, ATFM operational initiatives will be requested by an adjacent international ATFM facility only when national measures are exhausted and therefore compliance should be considered highly necessary. Accordingly, once information is exchanged regarding an ATFM initiative and an action is agreed, application of the ATFM operational initiative is considered MANDATORY. Importantly, it should be noted that a critical situation at the receiving ATC unit could require imposition of an ATFM restriction without any option of non compliance by the transferring ATC unit.

3.5 Below are the examples of possible ATFM messages:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC … REQUIRE 100 MILES IN TRAIL REGARDLESS OF FLIGHT LEVEL ON R220, R580 AND ALL PACOTS TRACKS FOR TRAFFIC LANDING NARITA ESTIMATING FIR BOUNDARY FROM 0100 UTC UNTIL 0500 UTC DUE TO SEVERE WEATHER".

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… CAPACITY RESTRICTION: LOS ANGELES HAS STARTED FLOW RESTRICTIONS FOR ALL AIRCRAFT LANDING LOS ANGELES DUE TO EARTHQUAKE. LOS ANGELES APPROACH IS UNABLE TO ACCEPT INBOUND TRAFFIC UNTIL FURTHER NOTICE".

## 4. ATFM Message Components

4.1 As the modular and structured ATFM message may contain several different elements of plain language, this section will examine each of the five components and detail some of the possible plain language words and phrases that are in use today.

### *The WHO Component*

4.2 The 'WHO' component identifies the ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact. ATFM units will be addressed by name until ICAO Annex 10 – *Aeronautical Telecommunications* is amended to incorporate appropriate ATFM unit identifiers. Examples of the 'WHO' component include:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER…"
- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC…"

### *The WHAT Component*

4.3 The 'WHAT' component identifies the ATFM objective to be achieved. The 'WHAT' component may also be used to provide ATFM information. Objectives include, but are not limited to:

- "REQUIRE (number) MILES (or MINUTES) IN TRAIL AT THE SAME FLIGHT LEVEL";

- "REQUEST (number) MILES (or MINUTES) IN TRAIL REGARDLESS OF FLIGHT LEVEL";
- "REQUEST A RATE OF LESS THAN (number) AIRCRAFT PER HOUR";
- "FLIGHT LEVELS (number) AND (number) NOT AVAILABLE";
- "ONLY FLIGHT LEVELS (number), (number) AND (number) ARE AVAILABLE";
- "(route/airport/airspace) NOT AVAILABLE DUE (reason) ALTERNATIVE[S] IS/ARE (routes/airports)".

***The WHERE Component***

4.4 The 'WHERE' component represents the location of the ATFM objective to be achieved. It is often preceded by a modifying clause, indicating which aircraft or group of aircraft the restriction will apply to. The modifying clause and the location combination are used to construct the 'WHERE' component. Examples of which aircraft or group of aircraft are to be restricted include:

- "FOR ALL AIRCRAFT…"
- "FOR TRAFFIC FASTER THAN 300 KNOTS…"
- "FOR HEAVY AIRCRAFT…"
- "FOR TRAFFIC LANDING…"
- "FOR AIRCRAFT DEPARTING…"
- "FOR TRAFFIC OVERFLYING…"
- "FOR AIRCRAFT PASSING…"

4.5 Examples of location include:

- "AT NIPPI…"
- "ON A337…"
- "WESTBOUND ON PACOTS TRACK CHARLIE…"
- "INBOUND ON G344…"
- "ON PACOTS TRACK 2 LANDING SAN FRANCISCO AIRPORT…"
- "ABOVE FLIGHT LEVEL 300…"

4.6 In practice the modifying clause and the location are combined into one ATFM message, for example*:*

- "FOR ALL AIRCRAFT WESTBOUND ON PACOTS TRACK CHARLIE…"

***The WHEN Component***

4.7 The 'WHEN' component represents the time and/or duration of the ATFM objective to be achieved:

- "[FROM (time)] UNTIL (time)".

4.8 Examples of time/duration include:

- "FROM 0300 UTC UNTIL 0600 UTC…"
- "FROM NOW UNTIL 0600 UTC…"

- "FROM 2300 UTC UNTIL FURTHER NOTICE…"
- "UNTIL FURTHER NOTICE…"

***The WHY Component***

4.9 The 'WHY' component represents the reason for the ATFM objective:

- "DUE TO (reason)";
- "FOR (reason)".

4.10 Examples of reasons include:

- "DUE TO RUNWAY CLOSURE"
- "FOR (SEVERE) WEATHER"
- "DUE TO COMMUNICATION FAILURE"
- "DUE TO (significant event/natural disturbance such as FIRE or VOLCANIC ASH)"
- "FOR STATE AIRCRAFT ACTIVITY"
- "DUE TO EQUIPMENT OUTAGE"
- "FOR EMERGENCY"
- "DUE TO ATFM INITIATIVES IN (location)"

## 5. ATFM Message Types

5.1 ATFM messages can be readily categorized by identifying the primary objective to be achieved by each type of message. This section describes a number of ATFM message types and their application in achieving particular objectives.

***Messages containing information to be shared prior to commencing ATFM restrictions***

5.2 ATFM related information-sharing should be facilitated not only during the actual flow control but also (and more importantly) well prior to invoking the ATFM restrictions when the possibility of flow control arises. The following phrases will make clear the distinction between the ATFM messages and the information provided for situational awareness:

- "POSSIBLE TRAFFIC FLOW RESTRICTIONS";
- "CAPACITY RELATED INFORMATION".

5.3 Examples of messages sent prior to invoking ATFM restrictions follow:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **POSSIBLE TRAFFIC FLOW RESTRICTIONS**… NARITA AIRPORT HAS CLOSED ONE RUNWAY AND STARTED SNOW REMOVAL".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **CAPACITY RELATED INFORMATION**…NARITA AIRPORT HAS ENTERED THE STORM ZONE OF THE TYPHOON".

***ATFM Operational Initiative Messages***

5.4 ATFM operational initiatives communicate air traffic flow restrictions/objectives from one air navigation service provider to another. They follow the five module structure described earlier:

a) Who: The ATFM service unit being contacted followed by the ATFM service unit that is initiating the contact.

b) What: The ATFM objective to be achieved.

c) Where: The location of the ATFM objective to be achieved.

d) When: The time and/or duration of the ATFM objective to be achieved.

e) Why: The reason for the ATFM objective.

5.5 Examples of ATFM operational initiatives include:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER … REQUIRE 30 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL FOR ALL AIRCRAFT LANDING CHICAGO FROM 0800 UTC UNTIL FURTHER NOTICE DUE TO STATE AIRCRAFT ACTIVITIES".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… FL350 AND BELOW NOT AVAILABLE FOR AIRCRAFT OVERFLYING JAPANESE DOMESTIC AIRSPACE UNTIL 0900 UTC DUE TO EMERGENCY".

***Reply to ATFM Operational Initiative Messages***

5.6 The following phrases will be used for replying to ATFM initiative messages:

- "ACCEPT (operational initiative)";
- "AGREED TO (operational initiative)";
- "(operational initiative) IS ACCEPTABLE [DEPENDS ON THE DEMAND] (other pertinent information, if any)";
- "UNABLE (operational initiative) [DUE (reason)] (alternative proposed)".

5.7 Examples of replying to ATFM operational initiatives follow:

- "**AGREE TO** 30 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL ON PACOTS TRACKS 2 AND 3 FROM 1000 UTC UNTIL 1500 UTC".

- "**UNABLE TO** ACCEPT THE RESTRICTION FROM 1430 UTC DUE TO TRAFFIC VOLUME ON A590 UNTIL 1530 UTC, **PROPOSE** COMMENCE RESTRICTION FROM 1530".

***Messages for the coordination of aircraft exempted from ATFM operational initiatives:***

5.8 The following types of aircraft may be exempted from ATFM restrictions:

a) Aircraft in a state of emergency
b) Aircraft engaged in search and rescue missions
c) Aircraft operating for humanitarian reasons
d) Aircraft carrying the head of State or distinguished visitors of State
e) Aircraft carrying a patient who needs urgent medical treatment

5.9 The following phrases will be used for the coordination of aircraft which are exempt from ATFM restrictions:

- "REQUEST EXEMPTION FROM ATFM FOR (aircraft identification) [DUE (reason)]";
- "COORDINATION OF ATFM EXEMPTION FOR (aircraft identification) [DUE (reason)]".

5.10 Examples of messages requesting ATFM exemption follow:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… **REQUEST EXEMPTION FROM ATFM**…UAL123 DUE PATIENT WHO NEEDS URGENT MEDICAL TREATMENT".

- "UAL123…EXEMPTION APPROVED".

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **COORDINATION OF ATFM EXEMPTION**… JA501A DUE OPERATING SEARCH AND RESCUE MISSIONS".

***Messages providing information for the next coordination***

5.11 If it is possible and appropriate, the expected time of next coordination should be forwarded with the ATFM messages:

- "I WILL CALL YOU AT (time) FOR FURTHER COORDINATION".

5.12 An example of a message with information for the next coordination follows:

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER… REQUIRE 30 MINUTES IN TRAIL REGARDLESS OF FLIGHT LEVEL FOR ALL AIRCRAFT ON PACOTS TRACK 8 FROM 1000 UTC UNTIL FURTHER NOTICE DUE TO MILITARY ACTIVITY. **I WILL CALL YOU AGAIN AT 1100 UTC FOR FURTHER COORDINATION".**

### *Amendment Messages*

5.13 The amendment of an ATFM message should be structured in a similar way to the initial message and include similar elements but with additional modifiers. These modifiers may include:

a) CHANGE
b) AMEND
c) REDUCE
d) INCREASE
e) DECREASE

5.14 Amendment messages should also identify which message is being amended, as several restrictions could be in place at one time. Examples of ATFM amendment messages include:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… WE HAVE **CHANGED** THE RESTRICTION ON TRAFFIC FLYING PACOTS TRACKS CHARLIE, ECHO AND FOXTROT FOR NARITA AIRPORT. WE NOW NEED 20 MINUTES IN TRAIL AT THE SAME FLIGHT LEVEL ON PACOTS TRACKS CHARLIE, ECHO AND FOXTROT FOR TRAFFIC LANDING NARITA FROM NOW UNTIL 0900 UTC".

- "FUKUOKA ATMC, THIS IS FAA COMMAND CENTER…WE HAVE **INCREASED** THE INBOUND RATE FROM 5 AIRCRAFT PER HOUR TO 10 AIRCRAFT PER HOUR FOR TRAFFIC BEYOND OAKLAND FIR UNTIL FURTHER NOTICE".

### *Cancellation Messages*

5.15 The cancellation of an ATFM message should be structured in a similar way to the initial message and include similar elements but also contain a canceling word or phrase. It is normally not necessary to state the reason for the cancellation. A canceling word or phrase may include:

a) CANCEL
b) RESUME
c) RESUME NORMAL
d) RELEASE

5.16 Cancellation messages should also identify which message is being cancelled, as several restrictions could be in place at one time. An example of an ATFM cancellation message follows:

- "FAA COMMAND CENTER, THIS IS FUKUOKA ATMC… **CANCEL** THE RESTRICTION ON TRAFFIC BEYOND THE FUKUOKA FIR AT THIS TIME. **RESUME NORMAL** TRAFFIC FLOW".

## 6. Active Listening

6.1 Although written ATFM messaging is able to be read and re-read to ensure understanding, because of the variety of ATFM information that may be exchanged verbally and the inability to prescribe phraseologies for every situation that will be encountered, **active listening** is encouraged. Active listening is a structured form of listening and responding that focuses the attention on the speaker. The listener must take care to attend to the speaker fully, and then repeats, in the listener's own words, what he or she thinks the speaker has said. The listener does not have to agree with the speaker; he or she must simply state what they think the speaker said. This enables the speaker to find out whether the listener really understood. If the listener did not understand, the speaker can explain further. Once the speaker and listener are clear as to the message, the listener should respond with agreement, acceptance or disagreement.

6.2 Active listening has several benefits. First, it forces people to listen attentively to others. Second, it avoids misunderstandings, as people have to confirm that they do really understand what another person has said.

## 7. Abbreviations

7.1 **Appendix 2** provides a sample list of abbreviations used that are not defined in the ICAO Doc. 8400 (PANS-ABC). Neighboring ATFM facilities may wish to develop a similar list of abbreviations which are frequently used in ATFM communications, and include them in a letter of agreement.

## Appendix 1

## EXAMPLES OF AIR TRAFFIC FLOW MANAGEMENT OPERATIONAL INITIATIVES

The following list contains the ATFM operational initiatives presently utilized by the United States Federal Aviation Administration. The list is provided for example purposes, it is not all-inclusive and does not preclude the innovation and application of other procedures that will result in improved ATFM service delivery.

| Name | Description |
|---|---|
| **Airborne holding** | Planned holding of aircraft may be utilized. This is normally done when the operating environment supports holding and the weather conditions are expected to improve shortly; this ensures aircraft are available to fill the capacity at the airport. |
| **Altitude** | Utilized to segregate different flows of traffic, or to distribute the number of aircraft requesting access to a specified geographic region.<br>***a) Capping:***<br>Term used to indicate aircraft will be cleared to an altitude lower than their requested altitude until they are clear of a particular airspace. Capping may apply to the initial segment of the flight or for the entire flight.<br>***b) Tunneling:***<br>Term used to indicate traffic will be descended prior to the normal descent point at the arrival airport to remain clear of an airspace situation; e.g., holding. |
| **Fix balancing** | Assigning an aircraft a fix other than that in the filed flight plan in the arrival or departure phase of flight to equitably distribute demand. |
| **Ground delay programs (GDP)** | Aircraft are held on the ground in order prior to departure to manage capacity and demand at a specific downstream location. The purpose of the program is to limit airborne holding. |
| **Ground stops (GS)** | GS is a process that requires aircraft that meet specific criteria to remain on the ground. Since this is one of the most restrictive methods of traffic management, alternative initiatives should be explored and implemented if appropriate. GSs should be used:<br>a) In severely reduced capacity situations (below most user arrival minimums, airport/runway closed for snow removal, or aircraft accidents/incidents);<br>b) To preclude extended periods of airborne holding;<br>c) To preclude sector/center reaching near saturation levels or airport grid lock;<br>d) In the event a facility is unable or partially unable to provide ATC services due to unforeseen circumstances; and<br>e) When routings are unavailable due to severe weather or catastrophic events. |

| Name | Description |
|---|---|
| **Miles-in-trail (MIT)** | The number of miles required between aircraft that meet a specific criteria. The criteria may be separation, airport, fix, altitude, sector, or route specific. MIT are used to apportion traffic into manageable flows, as well as to provide space for additional traffic (merging or departing) to enter the flow of traffic. |
| **Minutes-in-trail (MINIT)** | The number of minutes required between successive aircraft. It is normally used in a non-radar environment, or when transitioning to a non-radar environment, or when additional spacing is required due to aircraft deviating around weather. |
| **Reroutes** | Reroutes are ATC routings other than the filed flight plan. They are issued to:<br>a) Ensure aircraft operate with the "flow" of traffic.<br>b) Remain clear of special use airspace.<br>c) Avoid congested airspace.<br>d) Avoid areas of known weather where aircraft are deviating or refusing to fly. |
| **Sequencing programs** | These programs are designed to achieve a specified interval between aircraft; they may be software generated or determined by ATFM personnel. Different types of programs accommodate different phases of flight.<br>***a) Departure Sequencing Program (DSP):***<br>Assigns a departure time to achieve a constant flow of traffic over a common point. Normally, this involves departures from multiple airports.<br>***b) En route Sequencing Program (ESP):***<br>Assigns a departure time that will facilitate integration in the en route stream.<br>***c) Arrival Sequencing Program (ASP):***<br>Assigns fix crossing times to aircraft destined to the same airport. |

## Appendix 2

## SAMPLE TABLE OF ABBREVIATIONS

The abbreviations listed here are those used by the FAA Command Centre (ATCSCC) and Fukuoka ATMC respectively that are not defined in the ICAO Doc. 8400 (PANS-ABC), and are provided only as examples. The shaded abbreviations are considered to be the common terms between the two centers.

| ABBREVIATION | ATCSCC MEANING | ATMC MEANING |
|---|---|---|
| AAR | Airport Acceptance Rate | |
| ACID | Aircraft Identification | |
| ADL | Aggregate Demand List | |
| ADR | Airport Departure Rate | |
| ADZY | Advisory | |
| AIM | Aeronautical Information Manual | |
| ALTRV | Altitude Reservation | Altitude Reservation |
| ANP | Air Navigation Plan | |
| AOA | Office of the Administrator | |
| AOC | Airline Operations Center | |
| AP | Air Patrol | |
| APREQ | Approval Request | Approval Request |
| APVL | Approval | Approval |
| ARO | Airport Reservation Office | |
| ARTCC | Air Route Traffic Control Center | Air Route Traffic Control Center |
| ASM | | Airspace Management |
| AT | Air Traffic | |
| ATCSCC | Air Traffic Control System Command Center | Air Traffic Control System Command Center |
| ATMC | Air Traffic Management Center | Air Traffic Management Center |
| ATMetC | | Air Traffic Meteorological Center |
| ATO | Air Traffic Operations Program | |
| AUTODIN | Automatic Digital Network | |
| CARF | Central Altitude Reservation Function | |
| CCFP | Collaborative Convective Forecast Product | |
| CCWSU | Command Center Weather Service Unit | |
| CDM | Collaborative Decision Making | Collaborative Decision Making |
| CDR | Coded Departure Route(s) | Conditional Route |
| CDR | Continuous Data Recording | |
| CDT | Controlled Departure Time | |

| ABBREVIATION | ATCSCC MEANING | ATMC MEANING |
|---|---|---|
| CFR | Code of Federal Regulations (formerly FAR) | |
| CIWS | Corridor Integrated Weather System | |
| COMSEC | Communications Security System | |
| CR | Collaborative Routing | |
| CT | Select Flights Ground Delay Program | |
| CTA | Controlled Time of Arrival | |
| CTAS-TMA | Center TRACON Automation System Traffic Management Advisor | |
| CVRS | Computerized Voice Reservation System | |
| CWA | Central Weather Advisory | |
| CWSU | Center Weather Service Unit | |
| DARC | Direct Access Radar Channel | |
| DCCWU | ATCSCC Weather Unit | |
| DOTS | Dynamic Ocean Track System | Dynamic Ocean Track System |
| DP | Departure Procedure | |
| DSP | Departure Sequencing Program | |
| EDCT | Expected Departure Clearance Time | Expected Departure Clearance Time |
| EFAS | Enroute Flight Advisory Service | |
| EFTO | Encrypt For Transmission Only | |
| EOF | Emergency Operations Facility | |
| EOR | Emergency Operations Room | |
| EPS | Engineered Performance Standards | |
| ESCAT | Emergency Security Control of Air Traffic | |
| ETE | Estimated Time Enroute | Estimated Time Enroute |
| ETMS | Enhanced Traffic Management System | |
| EUCARF | European Central Altitude Reservation Facility | |
| FA | General Ground Delay Program | |
| FAA | Federal Aviation Administration | Federal Aviation Administration |
| FADT | Fuel Advisory Delay Time | |
| FCA | Flow Constrained Area | |
| FDMS | | Flight Data Management System |
| FDPS | | Flight Data Processing Section |
| FEA | Flow Evaluation Area | |
| FP | Flight Plan | |
| FPL | Full Performance Level | |

| ABBREVIATION | ATCSCC MEANING | ATMC MEANING |
|---|---|---|
| GA | General Aviation | |
| GAAP | General Aviation Airport Program | |
| GDP | Ground Delay Program | |
| GS | Ground Stop | |
| HARS | High Altitude Route System | |
| HDTA | High Density Traffic Airport | |
| IFCN | Interfacility Communication Network | |
| IFPFP | Individual Flight Plan From this Point | Individual Flight Plan From this Point |
| IFSS | International Flight Service Station | |
| INATS | Interruption of Air Traffic Service | |
| JCAB | Japan Civil Aviation Bureau | Japan Civil Aviation Bureau |
| LAA | Local Airport Advisory | |
| LADP | Local Airport Deicing Plan | |
| LOA | Letter of Agreement | Letter of Agreement |
| MAP | Monitor Alert Parameter | |
| MARSA | Military Assumes Responsibility for Separation of Aircraft | Military Assumes Responsibility for Separation of Aircraft |
| MEL | Minimum Equipment List | |
| MINIT | Minutes in Trail | |
| MIT | Miles in Trail | |
| MOS | Military Operations Specialist | |
| MTSAT | Multi-functional Transport Satellite | Multi-functional Transport Satellite |
| MVFR | Marginal Visual Flight Rules | |
| NADIN | National Airspace Data Interchange Network | |
| NAS | National Airspace System | |
| NAVAID | Navigational Aid | Navigation Aid |
| NFDC | National Flight Data Center | |
| NMCC | National Maintenance Coordination Center | |
| NOAA | National Oceanic and Atmospheric Administration | |
| NOM | National Operations Manager | |
| NOPAC | North Pacific | North Pacific |
| NOS | National Oceanographic Service | |
| NRP | National Route Program | |
| NTMO | National Traffic Management Officer | |
| NWS | National Weather Service | |

| ABBREVIATION | ATCSCC MEANING | ATMC MEANING |
|---|---|---|
| OAG | Official Airline Guide | |
| ODP | | Oceanic Air Traffic Control Data Processing System |
| OPSNET | Operations Network | |
| OTG | | Oceanic Track Generator |
| OTR | | Oceanic Transition Route |
| PACMARF | Pacific Military Altitude Reservation Facility | Pacific Military Altitude Reservation Function |
| PACOTS | Pacific Organized Track System | Pacific Organized Track System |
| PMTC | Pacific Missile Test Center | |
| PO | Plan of Operation | |
| Pref Route | Preferential Route | |
| PT | Planning Team | |
| RA | Route Advisory | |
| RAA | Remote Airport Advisory | |
| ROT | Runway Occupancy Time | |
| SAA | Special Activity Airspace | |
| SOP | Standard Operating Procedure | |
| STMP | Special Traffic Management Program | |
| SUA | Special Use Airspace | |
| SVRW | Severe Weather | |
| SWAP | Severe Weather Avoidance Program | |
| TEC | Tower-Enroute Control | |
| TELCON | Telephone Conference | |
| TFM | Traffic Flow Management | |
| TIS | Traffic Information System | |
| TMC | Traffic Management Coordinator | Traffic Management Coordinator |
| TMCIC | Traffic Management Coordinator in Charge | |
| TMI | Traffic Management Initiative | |
| TMU | Traffic Management Unit | Traffic Management Unit |
| TSTM | Thunderstorm | |
| WSO | Weather Service Office | |

**Asia/Pacific Region**
**Air Traffic Flow Management (ATFM) SURVEY**

## 1. General

1.1 The objective of this survey is to obtain information in order to learn about the current status of ATFM in Asia/Pacific States and Organizations with respect to:

a) The methods for estimating airport and ATC capacity;
b) ATFM procedures for the following phases:
   - Airport strategic
   - Airport tactical
   - Airspace strategic
   - Airspace tactical
c) Existing and planned equipment/infrastructure capable of supporting ATFM collaborative decision making (CDM), display and analysis; and
d) related matters included meteorology, AIS and map aspects related to ATFM provision.

1.2 This information will beneficial in enabling APANPIRG to fulfil its overall planning and harmonizing objectives. Accordingly, APANPIRG/20 (September 2009) adopted Conclusion 20/**xx** calling for the conduct of a regional ATFM survey during 2010

1.3 Mark with an "X" the corresponding answer. Please include your comments, if you deem pertinent. If necessary, use additional sheets. As applicable, send copies of requested electronic documents to the ICAO Asia/Pacific Regional Office icao_apac@bangkok.icao.int

## 2. Airport Capacity

2.1 Does your administration currently have a method, whether basic or complex, for calculating airport capacity? If yes, please send an electronic copy of the methodology to icao_apac@bangkok.icao.int

☐ YES ☐ NO

2.2 If yes, please provide any available airport capacity data for your main airports in the following table. Please note that for this table:

Total Capacity = Airport Acceptance Rate (AAR) + Airport Departure Rate (ADR).

| Airport Name | Runway configuration | Airport Acceptance Rate (AAR) VFR | MVFR | IFR | Airport Departure Rate (ADR) | Total Capacity |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Table 1**

Comments

## 3. En-route Sector Capacity

3.1 Does your administration currently have a method, whether basic or complex, for calculating enroute sector capacity? If yes, please send an electronic copy of the methodology to icao_apac@bangkok.icao.int

☐ YES ☐ NO

3.2 If yes, please provide any available airport capacity data for your main airports in the following table. Under the "Time Increments" column, please indicate if the sector capacity is computed by 15-minute increments, 60-minute increments, or some other increment.

| ACC | Sector Name | Sector Altitudes | Sector Capacity | Time Increments |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Table 2**

Comments

## 4. Procedures for Phases of ATFM

4.1 Does your administration currently have procedures/arrangements in place to support the following phases of ATFM?

a) Airport Strategic

☐ YES ☐ NO

b) Airport Tactical

☐ YES ☐ NO

c) Airspace Strategic

☐ YES ☐ NO

d) Airspace Tactical

☐ YES ☐ NO

Comments

## 5. Flow Management Data Processing and Display

5.1 Does your administration have a system to receive, process, and display flight plan data (FPL, RPL, etc.)?

☐ YES ☐ NO

5.2 Does your administration have a database that includes airspace information (for example, ACC boundary coordinates, sector boundary coordinates, NAVAIDS, airways, special use airspace) and airport information (for example, runway and taxiway layout, ramp layout, parking gate information)?

☐ YES ☐ NO

5.3 Does your administration have an electronic ATFM system that displays airborne traffic?

☐ YES ☐ NO

5.4 Does your administration have a communication system that allows automated or manual exchange of messages to support ATFM decision making (for example, SLOT assignment messages, SLOT adjustment messages, delay reporting messages, alternate route messages)?

☐ YES ☐ NO

5.5 Does your administration have a system to monitor and display the airport acceptance rates (AAR) at the main airports?

☐ YES ☐ NO

5.6 Does your administration have a system to monitor and display enroute sector capacity?

☐ YES ☐ NO

5.7 Does your administration have a system to monitor and display the mix of aircraft using the airspace or airports?

☐ YES ☐ NO

## 6. Surveillance Systems for ATFM Support

6.1 In the following table, list the type of surveillance systems in use in your administration's airspace structure.

| ACC Surveillance System | TMA Surveillance System | Other Surveillance System |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**Table 3**

## 7. AIS/Map for ATFM Support

7.1 On the following lines, list the AIS and map databases that your administration has available to support ATFM.

7.2 Are they available in an electronic format?

☐ YES ☐ NO

7.3 What is the routine AIS database update cycle?

☐ 28-DAY UPDATE ☐ 56-DAY UPDATE ☐ OTHER

## 8. Meteorological Information

8.1 On the following lines, list the specific meteorological products and/or websites that your administration has available to support ATFM.

## 9. Data for Historical and Statistical Analysis

9.1 On the following lines, list the type of databases your administration maintains to support the analysis of air traffic operations and meteorological activities.

## 10. Communications capabilities for Collaborative Decision Making in ATFM

10.1 List the types of communication systems your operational units already have or could straightforwardly have with:

(a) other centralized ATFM organizations

(b) other ATS units and/or Flight Management Units

(c) operators and airspace users

(d) airport authorities

(e) meteorological authorities

(f) aeronautical information services

(g) the transmission of radar and ADS data to the ATFM center

- END -

# Terms of Reference

## Southeast Asia Route Review Task Force (RR/TF)

1) The objective of the ICAO RR/TF is:

   In collaboration with affected stakeholders and ensuring inter-regional harmonization, develop and implement strategic, benefits-driven plans to improve en-route airspace efficiency.

2) To meet this objective the Task Force shall:

   a) Review the existing route structures in the WPAC/SCS area south of the Fukuoka FIR, taking into consideration the AR9 traffic flow.

   b) Determine the reduced horizontal separation required, taking into account the aircraft approval status of the traffic operating on the relevant route.

   c) Examine the possibility of a step-by-step or phased implementation of new route structure and detail the phases required and the areas/routes concerned.

   d) Develop and action the necessary strategic plans with appropriate timelines to implement the new route structure based on the APANPIRG Regional PBN Implementation Plan and ICAO Standards and Recommended Practices, whilst taking into account the need for inter-regional harmonization, State and user requirements.

   e) Ensure the conduct of Annex 11 compliant pre-implementation safety assessments and make arrangements for States to conduct ongoing post-implementation safety monitoring in accordance with ICAO provisions.

   f) Consider setting up appropriate teams/groups which might but not necessarily, include the entire Task Force, to address and implement specific agreed measures within specific airspaces.

   g) Cooperate with other Task Forces and groups which are involved with similar work in adjacent airspaces in order to achieve harmonized inter-regional solutions.

   h) Explore possibilities for further enhancements to operational efficiency of route structures through reconfiguration and/or enhanced surveillance.

3) Membership of the RR/TF should include, but not be limited to: Cambodia, China (for Sanya FIR), Hong Kong China, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Vietnam and IATA.

4) The RR/TF reports to the ATM/AIS/SAR Sub Group of APANPIRG

***(last amended ATM/AIS/SAR/SG/19- 26 June 2009)***

# AGENDA ITEM 6: REVIEW OF ATS COORDINATION GROUP MEETINGS

**Agenda Item 6: Review of ATS coordination group meetings**

**Update on activities of ATS Coordination Groups in the Asia/Pacific Region**

6.1 The meeting was updated on the activities since the ATS/AIS/SAR/SG/18 meeting (June 2008, Bangkok) of the ICAO and the States' ATS coordination groups that contribute to the work of APANPIRG. The following sub-regional ATS coordination group meetings were held:

1. ICAO ATS Coordination Groups

- **Bay of Bengal ATS Coordination Group (BBACG)**

  BBACG/20 (Male, 26 - 30 January 2009, with ASIOCG/4)

  Air Traffic Flow Management Task Force (ATFM/TF)

  - ATFM/TF/12 (Cairo, 13 – 17 July 2008, with IRAI)

  FANS Implementation Team, Bay of Bengal (FIT-BOB)

  - FIT-BOB/10 (Mumbai, 7 − 11 July 2008, with ASIOACG/3)

- **Southeast Asia ATS Coordination Group (SEACG)**

  SEACG/16 (Bangkok, 11-15 May 2009, with FIT-SEA/9)

  Southeast Asia RNP Implementation Task Force (RNP-SEA/TF)

  - RNP-SEA/TF/4 (Singapore, 5 – 7 November 2008)

  FANS Implementation Team, South -East Asia (FIT-SEA)

  - FIT-SEA/9 (Bangkok, 11 - 15 May 2009, with SEACG/16)

- **Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG)**

  WPAC/SCS RSG/5 (Bangkok 14 - 17 October 2008)

2. ICAO Special Coordination Meetings (SCM)

- **Special Coordinating Meeting Civil Aviation Authority Singapore**

  SCM/CAAS (Bangkok, 17 February 2009)

3. ICAO Interregional Coordination Meetings

- **Inter Regional Afghanistan Interface (IRAI) meeting**

  IRAI (Cairo, 13-17 July 2008, with ATFM/TF/12)

- **Third Inter Regional Meeting between APAC, ESAF, EUR/NAT and MID Regional Offices**

  IRCM/3 (Cairo 24-26 March 2009)

- **China, Mongolia, Russian Federation, IATA ATS Coordination Group (CMRI)**

  Did not meet, last meeting CMRI/5 (Bangkok, 20 -22 June 2007)

- **Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS)**

  TRASAS/3 postponed; last meeting TRASAS/2 (Bangkok, 18 – 19 March 2008)

4. State ATS Coordination Groups

- **Informal South Pacific ATS Coordinating Group (ISPACG)**

  ISPACG/23 (Chile, 19 – 23 March 2009, with FIT/16)

  FANS Interoperability Team (FIT)

  - FIT/16 (with ISPACG/23)

    (http://www.faa.gov/ats/ato/ispacg.htm)

- **Informal Pacific ATC Coordinating Group (IPACG)**

  IPACG/29 (Fukuoka, 27 – 31 October 2008, with FIT/16)

  IPACG/30 (Seattle, 18 – 22 May 2009, with FIT/17))

  FANS Interoperability Team (FIT)

  - FIT/16 (Fukuoka, 28 October 2008, with IPACG/29)
  - FIT/17 (Seattle, 19 May 2009, with IPACG/30)

    (http://www.faa.gov/ats/ato/ipacg.htm)

- **Asia/Pacific Regional Air Navigation Service Providers Conference (ANSP Conf)**

  ANSP/4 (Singapore, 26-28 April 2009)

- **Arabian Sea/Indian Ocean ATS Coordination Group (ASIOACG)**

  ASIOACG/3 (Mumbai, 7 – 11 July 2008, with FIT-BOB/10)

ASIOACG/4 (Male, 26-30 January 2009, with BBACG/20)

(http://ekgroup.com/raws , raws, r@Ws123)

**Twentieth Meeting of the Bay of Bengal ATS Coordination Meeting (BBACG/20)**

6.2 The meeting noted the following main points of interest arising from BBACG/20:

a) BBACG established the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF) under the group with the scope of work commencing with a Phase 1 programme to implement widespread 50 NM longitudinal separation using CPDLC communications in the Bay of Bengal during 2009. The Terms of Reference of BOB-RHS/TF approved by the group is in **Appendix A** to the Report on Agenda Item 6.

b) BBACG recognized the necessity for a formal monitoring programme, on a sub-regional basis for lateral and longitudinal navigation errors in the Bay of Bengal and that limitations in the availability of safety monitoring services would hinder implementation.

**Twelfth Meeting of Air Traffic Flow Management Task Force (ATFM/TF/12)**

*Please refer to Agenda Item 5.*

**Tenth Meeting of FANS Implementation Team, Bay of Bengal (FIT-BOB 10)**

6.3 The following were the main points of interest from the FIT-BOB/10 meeting:

a) Legal and financial agreements between India, IATA and Boeing were in place to enable provision of CRA services to support FIT activities for the Bay of Bengal and the Arabian Sea. FIT-BOB/10 recognized that although India would be the State involved in providing data to IATA for charging purposes, the remaining States of the Arabian Sea, the Bay of Bengal and the Indian Ocean should also be alerted to the imminent commencement of CRA services and requested to appraise affected parties accordingly.

b) Indonesia will commence ADS/CPDLC operational trials in the Jakarta and the Ujung Pandang FIRs during 2009 and 2010, respectively.

c) Malaysia is planning a H24 operational trial of ADS/CPDLC for April 2009. An ADS/CPDLC operational trial is being conducted on seven oceanic ATS routes, namely A327, B466, L510, L645, N571, P574 and P628in the Kuala Lumpur FIR.

d) Arab Civil Aviation Commission FANS Implementation Group (AFIG) delegates were invited to continue to continue to join the FIT-BOB meetings; and

e) Data Link Implementation Strategy was adopted by meeting.

**Sixteenth Meeting of the Southeast Asia ATS Coordination Group (SEACG/16)**

6.4 The meeting noted the following main points of interest arising from SEACG/16:

a) Singapore reported that there were at least 61 occasions where time restrictions were imposed on M771 during the period from 3 July 2008 to 20 April 2009. The time restrictions required Singapore ATC to provide a time buffer for either all flights or between flights bound for the same destination, regardless of flight level. Hong Kong, China remarked that the traffic flow regulation on M771 for flights bound for Guangzhou and/or Shenzhen was placed by Hong Kong ACC mainly due to the limited number of transfer of control points/flight levels that are available for those flights between Hong Kong and China as well as the high traffic density in the Hong Kong terminal control area (TMA).

b) Thailand also updated the SEACG/16 meeting, in many occurrences in the past, flow control restrictions were imposed by Taipei ACC, due to system maintenance between 1525 – 1840 UTC (2225 – 0140 Thailand time). Hong Kong China and Japan agreed that they would bring this forward to the attention of Taipei ACC at East Asia ATM Coordination Group (EATMCG) in June 2009;

c) Arrangements for Large Scale Weather Deviation (LSWD) procedures were agreed; activation NOTAMS should be sent in accordance with the current protocols between NOF.

d) IATA had informed that L642 and M771 were designed to be laterally separated by 60 NM, with convergence of routes occurring within surveillance coverage. However, as a consequence of the improved surveillance and communications they have been upgraded to RNP 10 routes. In fact the surveillance and communications capabilities are now at a level where even RNP4 can be applied. Hong Kong, China responded that realignment of L642 and M771 would likely to affect operations on adjacent ATS routes such as A1 and P901, and require safety assessment. A more holistic plan acceptable to all and comprehensive concerned parties would need to be worked out; and

e) The Secretariat drew to the attention of the meeting that the contingency plans required in Annex 11 – *Air Traffic Services* shall be developed by the State(s) responsible for providing ATS in particular portion of airspace, in the event of disruption of the services, to ensure the safe operations of international air traffic over the high seas. States should adopt the ICAO model of the Indonesian National ATM Contingency Plans of Jakarta and Ujung Pandang FIRs.

6.5 IATA remarked to the Sub-Group that they supported Hong Kong's comments on the question of realigning L642 and M771 about the need to treat these matters from a holistic viewpoint. IFATCA informed the meeting that an EATMCG meeting was held in June 2009 and the Taipei ACC was aware that the flow regulation imposed by the ACC had been raised at SEACG/16. When the new radar system for Taipei ACC is implemented it is expected that the periods of flow restrictions will significantly reduce.

**Fourth Meeting of Southeast Asia RNP Implementation Task Force (RNP-SEA/TF/4)**

6.6 The meeting noted the main points of interest arising from RNP-SEA/TF/4:

a) The period of TSD collection commenced two weeks after the implementation and the data collected were compared with the TSD collected for a similar period in 2007, i.e. TSD collected for the periods between 15 July–15 September 2008 and 15 July–15 September 2007. After the implementation, the maximum movement rate on M771 stood at 15 movements per hour, a 7% increase, whereas on L642 the maximum movement rate had gone up from 11 to 13 movements per hour, an 18% increase;

b) A two-month traffic sample data was taken to measure delays for flights departing from Changi Airport and operating on RNAV route M771. The data collected showed that average delay per flight had reduced from 1.28 minutes down to 1.09 minutes, a 15% reduction;

c) Based on system performance during the first 90 days after the introduction of the 50 NM lateral separation standard between L642 and M771 and the 50 NM longitudinal separation on these routes, it was concluded that the regional lateral and longitudinal TLS were satisfied;

d) The safety assessment supported the continued use of RNP 10 (50 NM/50 NM) horizontal separation on L642 and M771, and agreed that the application of RNP 10 (50 NM/50 NM) horizontal separation shall continue on L642 and M771.

e) The meeting noted in the regional plan that RNP 4 is preferred (RNAV 10 is acceptable) in oceanic airspace in the short term (2008-2012) and RNP 2 is preferred (RNP 4 and RNAV 10 are acceptable) in the medium term (2013-2016). The meeting, however, recognized that there was no need to wait for these dates to conduct implementations and, where States were agreeable, implementations could take place earlier than the guidelines given in the PBN regional plan; and

f) The RNP-SEA/TF/4 meeting discussed the three options as proposed for the next phase of work for the Task Force. RNP 10 operations on the remaining four parallel unidirectional routes would need the active participation of the Philippines as the four routes transit through the Manila FIR. The RNP-SEA/TF/4 meeting urged ICAO Secretariat to encourage the Philippines to participate in future Task Force activities.

Follow-Up Action by the Secretariat

6.7 In accordance with the agreement at RNP-SEA/TF/4, the Chairman and the Secretariat met at the Regional Office on 17 February 2009. As to the RNP 4 implementation on L642 and M771, Hong Kong, China had informed the Regional Office that they considered the implementation of RNP 4 on these two routes could take place in the Hong Kong FIR around 2013, in line with their internal airspace improvement/enhancement programme.

6.8 In terms of the RNP 10 implementation on the other four parallel routes, it is imperative that the data link services be available in the Manila FIR. Philippines recently informed the Regional Office that they had commenced a project of the "Replacement of the Manila Area Control Center's Air Traffic Control System" including ADS-C and CPDLC. In this regard, the Secretariat will coordinate with the Philippines to clarify when operational ADS/CPDLC capability is expected to become available. In light of this, RNP-SEA/TF/5 planned in April 2009 was postponed until after the coordination with the Philippines is completed.

6.9 The Sub-Group noted that:

a) the lateral and longitudinal separation on RNAV routes L642 and M771 has been successfully reduced to 50 NM/50 NM since 3 July 2008; and

b) that Singapore has led RNP-SEA/TF for three years, assisting in the successful implementation of 50/50 on L642 and M771;

**Ninth Meeting of FANS Implementation Team, Southeast Asia (FIT-SEA/9)**

6.10 The following were the main points of interest arising from the FIT-SEA/9 meeting.

a) The CPDLC performances of downlink in the Ho Chi Minh FIR was 1 minute and 1 second for 95 %, which only marginally met the system performance criteria specified in the *FANS Operations Manual* (FOM requires 1 minute for 95 %). The system performance met the performance criteria of 3 minutes for 99 %. The system performances in the Singapore FIR for downlink were 93.88 % for 1 minute and 98.88 % for 3 minutes. They did not meet the performance criteria of 95 % and 99 % specified in the FOM;

b) There had been no Problem Report (PR) for 12 months from either Singapore or Vietnam. From the experience in the North Pacific where hundreds of PRs are reported, the situation of no PR in the South China Sea area could not be explained;

c) Japan reminded the FIT-SEA/9 meeting that CRA-Japan was providing FIT-SEA CRA services on a temporary basis in accordance with the TOR of FIT-SEA CRA and Japan Civil Aviation Bureau (JCAB) was considering ceasing their service for FIT-SEA CRA. Philippines advised the FIT-SEA/9 meeting that they would initiate the ADS/CPDLC operation trial in the Manila FIR in Q3 or Q4 of 2010, and Japan could consider extending the provision of FIT-SEA CRA services for a couple of years until the ADS/CPDLC operation trial in the Manila FIR in 2010. The meeting recognized the need to establish a formal FIT-SEA CRA in the future and requested update at the next meeting from CRA-Japan and the Philippines;

f) The FIT-SEA/6 meeting acknowledged and appreciated the contributions made by CRA-Japan towards the ADS/CPDLC operations which enabled the quick implementation of the data link services in the Ho Chi Minh FIR;

g) Philippines informed that budget approval was obtained for their ACC replacement project, which will replace the current equipment with new one that will have a build-in data link capability. This is a priority project and data link trials are planned for 3rd or 4th quarter 2010. In conjunction with this project, Manila is commencing ADS/CPDLC refresher course and enhanced simulator training courses

from the end of May 2009. This program includes the formulation of plans and procedures on these trials.

**Third and Fourth Meetings of the Arabian Sea/Indian Ocean ATS Coordination Group (ASIOACG/3 & 4)**

6.11 The following were the main points of interest arising from the ASIOACG/3 & 4 meetings:

a) Airservices Australia announced that it would extend RNP 4 to the Melbourne FIR to support application of 30/30 NM separations in the oceanic airspace with a target date 12 March 2009;

b) Legal agreements have been signed between India and IATA, and IATA and Boeing, in regard to funding arrangements for the Bay of Bengal Central Reporting Agency (BOB-CRA);

c) AAI reported on the evaluation of the trial suspension of the FLAS within the Mumbai FIR since August 2008 and noted that the trials were encouraging;

d) It was also reported that an analysis was undertaken on 16 ATS routes within the Mumbai FIR from July 2008 to December 2008 and only 40% or 5,230 flights had logged onto the Mumbai ADS-C/CPDLC system;

e) India, Maldives and Mauritius will convene a meeting in the near future to discuss ICAO deficiencies in the areas of SAR and ATS Letters of Agreement, etc;

f) Maldives and Sri Lanka have established connector routes between the Colombo and Male FIRs from 18 December 2008;

g) A connector route from KITAL direct to ELKEL in the Arabian Sea was implemented on 12 March 2009;

h) The ASIOACG/3 meeting agreed the trial suspension of the FLAS in the Arabian Sea. The trial results were reported at ASIOACG/4 by Airports of India (AAI) to be encouraging and were welcomed by the representatives of Emirates Airlines and Etihad Airlines;

i) The many benefits of flex tracks were demonstrated in a presentation from Emirates Airlines. The next step was hoped to be a move to User Preferred Routes (UPR) and subsequently dynamic re-route in flight procedures (DARP);

j) The ASIOACG/4 meeting agreed that the re-designation of ‘conventional’ routes as RNAV routes would enable transition to RNP-based separation minima in accordance with the ICAO PBN Concept. Based on further guidance provided by the ICAO Asia and Pacific Office, a Draft Air Navigation Plan Amendment Proposal was prepared with a target date for implementation on AIRAC 19 November 2009;

k) The ASIOACG/3 meeting agreed to establish a “Data Collection Working Group” to baseline Aircraft and ATM capabilities to assist in the planning and implementation of airline defined optimum routes, reduced separation standards and related ATM procedures. Although the planned “Data Collection Working Group”

did not meet, Airservices Australia was able to undertake an analysis based on the December 2007 data provided to ICAO.

**Twenty-ninth and Thirtieth Meeting of the Informal Pacific ATC Coordinating Group (IPACG/29 & 30)**

6.12 The United States presented an information paper jointly with JCAB presenting a summary of outcomes from the two Informal Pacific Air Traffic Control (ATC) Coordinating Group (IPACG) meetings that convened during the past 12 months. The IPACG/29 meeting, as well as the 16th Meeting of the IPACG Future Air Navigation Systems (FANS) Interoperability Team (FIT/16), were hosted by the JCAB in Fukuoka, Japan from 27-31 October 2008. This meeting celebrated the twentieth year anniversary of IPACG and commemorated the occasion with the signing of the Fukuoka Joint Statement. The IPACG/30 and FIT/17 meetings were hosted by the U.S. Federal Aviation Administration (FAA) in Seattle, Washington from 18-22 May 2009. Full and detailed meeting reports, including attendee's listings, action item tracking, capacity enhancement tables and reports of the 16th and 17th FIT meetings are available on the U.S. Federal Aviation Administration's web site at:
http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/oceanic/ipacg/.

**Twenty-third Meeting of the Informal South Pacific ATS Coordination Group (ISPACG/23)**

6.13 The United States presented a status paper on the ISPACG/23 that was hosted by the Dirección General de Aeronáutica Civil de Chile (DGAC) in Santiago, Chile from 26-27 March 2009. ISPACG/23 followed a meeting of the ISPACG Planning Team on 23 March 2009 and the FIT/16 that took place from 24-25 March 2009. During the meeting, participating States provided national summary reports of their respective ATS accomplishments over the past year. Discussions continued the ISPACG's work in the areas of AIDC implementation, DARP expansion, development and adoption of the Global Operational Datalink Manual (GOLD), use of Strategic Lateral Offset Procedures (SLOP), development of shared performance metrics for fuel and emissions, and variations in airspeed in controlled airspace. The full and detailed meeting report, including attendees listing, action item tracking, capacity enhancement tables, and report of the FIT/16 meeting are available on the Airways New Zealand web site at: http://www.airways.co.nz/ispacg/index.asp.

**ICAO Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS)**

6.14 TRASAS was established in recognition that matters involving the northern ATS route systems affected five ICAO regions and appropriate coordination was necessary to advance the requirements of international civil aviation for a coherent and economically viable and operationally optimal structure of ATS routes, linking city-pairs in Europe and Asia, Europe and North America and Asia and North America. TRASAS would work towards ensuring the route network would have sufficient flexibility to plan different flight paths, day-by-day, to take advantage of prevailing upper winds. The TRASAS Group shall make proposals and promote improvements for the safety and efficiency of the Northern area route structure and the supporting ATM systems within the States affected by such proposals.

6.15 The third meeting of TRASAS had been scheduled in March 2009. Whilst reviewing the progress of the work matters on the TRASAS work programme, it was evident that more time was necessary to allow the matters in work to progress. Accordingly, the TRASAS/3 meeting was postponed until a further review could be conducted in July 2009.

**Seventh Cross Polar Working Group Meeting (CPWG/7)**

6.16 The United States presented information on the latest Cross Polar Trans-East ATM Working Group Meeting (CPWG/7) that was held at the ICAO Office in Paris, 3-5 June 2009. Topics of discussion included extension of routes from Russia Airspace into Anchorage Center Airspace, challenges of transitioning to metric altitudes, lateral separation standards (RNP 10), and loss of communications procedures. The reduction of separation project for the Arctic Airspace began in February of 2009 and will initially encompass Anchorage Oceanic FIR and Canadian MNPS airspace. A draft Concept of Operations and project task list was presented to the meeting with a target implementation date of 18 November 2010. The CPWG agreed to conduct a trial to address the challenges in converting from imperial to metrics altitudes between Anchorage and Russian airspace.

# Terms of Reference

## Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF)

1) The objective of the ICAO BOB-RHS Task Force is:

In collaboration with affected stakeholders and ensuring inter-regional harmonization, develop and implement strategic, benefits-driven plans to improve en-route airspace efficiency by means of the implementation of reduced horizontal separation (lateral and longitudinal) based on the ICAO RNAV 10 (RNP 10) and RNP 4 PBN navigation specifications within the Bay of Bengal area.

2) To meet this objective the Task Force shall:

a) Review the existing Bay of Bengal route structures and examine suitabilities for implementation of reduced horizontal separation.

b) Identify areas/routes where the implementation of reduced horizontal separation would bring immediate operational efficiency

c) Determine the reduced horizontal separation required, taking into account traffic volumes and disposition, approval status of the aircraft operating on the relevant routes, user expectations and the communication and surveillance capabilities of ATS providers involved.

d) Examine the possibility of a step-by-step or phased implementation of reduced horizontal separation and detail the phases required and the areas/routes concerned.

e) Develop and action the necessary strategic plans with appropriate timelines to implement reduced horizontal separations based on the APANPIRG Regional PBN Implementation Plan and ICAO Standards and Recommended Practices, whilst taking into account the need for inter-regional harmonization and user requirements.

f) Ensure the conduct of Annex 11 compliant pre-implementation safety assessments and make arrangements for States to conduct ongoing post-implementation safety monitoring in accordance with ICAO provisions.

g) Consider setting up appropriate teams/groups which might but not necessarily, include the entire Task Force, to address and implement specific agreed measures within specific airspaces.

h) Cooperate with other Task Forces and groups which are involved with similar work in adjacent airspaces in order to achieve harmonized inter-regional solutions.

i) Explore possibilities for further enhancements to operational efficiency of route structures through reconfiguration and/or enhanced surveillance.

3) Scope of work:

The Task Force shall adopt a phased implementation programme, as follows:

**Phase One:** implement widespread 50NM longitudinal separation using CPDLC communications in the Bay of Bengal during 2009.

**Phase Two:** *To be determined*

**Phase Three:** *To be determined*

4) The Task Force reports via the ICAO Bay of Bengal ATS Coordination Group (BBACG) to the ATM/AIS/SAR Sub Group of APANPIRG.

***(last amended BBACG/20 - 29 January 2009)***

# AGENDA ITEM 7: REVIEW PROGRESS OF THE REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP (RASMAG)

**Agenda Item 7: Review progress of the Regional Airspace Safety Monitoring Advisory Group (RASMAG)**

7.1 The meeting reviewed a summary from RASMAG of the most up-to-date safety assessments of RVSM operations in the widespread airspaces of the Asia/Pacific Region, as prepared by the Asia/Pacific RVSM Regional Monitoring Agencies (RMAs). The summary also included details of the horizontal (lateral and longitudinal) safety performance of the South China Sea parallel route structure.

7.2 The airspace safety monitoring for all RVSM airspaces of the Asia/Pacific region is conducted as a regional programme in accordance with the standards of Annex 11 (paragraphs 3.3.5.1 & 3.3.5.2), utilizing the specialist expertise of the Asia/Pacific RVSM Regional Monitoring Agencies approved by APANPIRG. With the exception of the Pyongyang (scheduled October 2009) and Ulaanbaatar (scheduled 2012) FIRs, RVSM has been implemented throughout the Asia/Pacific region.

7.3 There are five APANPIRG Approved RMAs providing vertical safety monitoring services in the region:

a) The Australian Airspace Monitoring Agency (AAMA), operated by Airservices Australia.

b) The China RMA, operated by the Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC).

c) The JCAB RMA, operated by the Japan Civil Aviation Bureau.

d) The Monitoring Agency for the Asia Region (MAAR), operated by Aeronautical Radio of Thailand (AEROTHAI).

e) The Pacific Approvals Registry and Monitoring Organization (PARMO), operated by the United States Federal Aviation Administration.

7.4 Horizontal (lateral and longitudinal) safety monitoring services for the South China Sea parallel route network are provided by the Southeast Asia Safety Monitoring Agency (SEASMA), operated by the Civil Aviation Authority of Singapore.

**Large Height Deviation**

7.5 RASMAG has adopted the following plain language definition of a LHD for regional promulgation:

*A RVSM large height deviation (LHD) is defined as any vertical deviation of 90 metres/300 feet or more from the flight level expected to be occupied by the flight.*

**Technical and Operational Risk**

7.6 RMAs consider LHD performance in terms of two components. Technical risk relates to the technical performance of equipment, including altimetry systems. Operational risk relates to human performance error and, in simple terms, relates to errors made by pilots and air traffic controllers.

**RVSM Minimum Monitoring Requirements (MMRs)**

7.7 In recognition of the need for long term global monitoring of RVSM height-keeping performance, deliberations by the ICAO Separation and Airspace Safety Panel (SASP) and actions by the ICAO Air Navigation Commission (ANC) have recently resulted in the addition of long-term RVSM monitoring requirements to Annex 6, with the effective date of the requirements planned for November 2010.

7.8 RASMAG understood that the Annex 6 provisions would take effect in about 2 years time, from November 2010, so were not presently applicable. Also, as the RMA Manual was further delayed, the status of the RVSM Minimum Monitoring Requirements (MMRs) in the RMA Manual was questionable. RASMAG recognized that the MAAR MMRs, that that had been adopted by RASMAG/3 and used since then (as amended) in the Asia/Pacific region, had only slight differences from the MMRs in the RMA Manual and were always at least equal to or more exacting than the Annex 6 requirements. Consequently, RASMAG agreed that, in the interim until the RMA Manual and/or Annex 6 provisions became applicable, the existing MMRs should continue in use by Asia/Pacific RMAs and adopted draft Conclusion RASMAG 10/1 inviting APANPIRG to adopt the existing Asia/Pacific MMRs.

**RVSM Monitoring Impact Statement**

7.9 APANPIRG/18 (September 2007) had recognized that the 2010 implementation of Annex 6 global long term monitoring requirements for airframes used in RVSM operations would have significant impacts in the way regional monitoring was managed, including the need for widespread regional height monitoring infrastructure capability to be made available. Under the terms of Conclusion 18/4, APANPIRG tasked Asia/Pacific RMAs in conjunction with RASMAG to prepare a regional impact statement summarizing the estimated consequences for the Region, including consideration of the numbers of airframes required to be monitored and ground infrastructure required.

7.10 Extensive work was conducted by RASMAG/11 in preparing the *Asia/Pacific Regional Impact Statement – RVSM Global Long Term Height Monitoring Requirements effective from November 2010*, a copy of which is shown at **Appendix A** to the Report on Agenda Item 7. RASMAG/11 had drafted Conclusion RASMAG 11/3 calling for APANPIRG to adopt the RVSM Monitoring Impact Statement as regional guidance material. Review and comment was invited, to reach the Secretariat by 31 July 2009 in order to provide time for the Secretariat to compile and circulate a final version for review by RMAs.

**Difficulties in coordination with States**

7.11 In relation to RVSM monitoring APANPIRG/19 agreed that effective coordination arrangements between States and RMAs was a critical first step and adopted Conclusion 19/5 encouraging States to immediately strengthen relationships with their respective RMAs to ensure that information in relation to RVSM approval status is continuously available to RMAs.

7.12 Discussion took place during RASMAG/10&11 regarding the ability of an RMA such as MAAR, which has to coordinate with a large number of States, to effectively obtain information from State authorities that are less than cooperative. PARMO commented that they are having similar problems with some States as they are being ignored when they ask for additional information in relation to specific aircraft. The Secretary noted that this is a perennial problem for RMAs however States (i.e. not RMAs) are clearly responsible for compliance with Annex provisions – including Annex 6 and Annex 11 in regard to safety monitoring. RMAs are not able to assist those who do not participate.

7.13 As a result of these discussions RASMAG/11 agreed that States would be asked for their current RVSM approvals data as an additional item for transmission to the RMAs with the annual December traffic sample data (TSD), and that a standard letter template would be drafted by RASMAG for RMAs to use when required in support of specific enquiries to States. The following Conclusion was drafted for consideration by APANPIRG/20:

***Draft Conclusion RASMAG 11/1 – Provide Annual Update of RVSM Approvals to RMAs***

*That, in conjunction with the annual December traffic sample data submission required by Conclusion 16/4, the continuous update of RVSM Approvals data called for by Conclusion 19/15, and APANPIRG RMA requirements, States also provide an annual update of RVSM Approvals data.*

**China RMA support to DPRK RVSM implementation**

7.14 RASMAG recalled the intention of the Democratic People's Republic of Korea (DPRK) to implement RVSM in the Pyongyang FIR during 2009. Subsequently, in coordination with the Regional Office DPRK had adopted the October 2009 AIRAC as the target date for implementation and the implementation would be based on Annex 2 metric flight level arrangements, as used in China.

7.15 China RMA updated the meeting, confirming their willingness to assist DPRK with implementation of RVSM, including provision by China RMA of safety assessment and monitoring services for the 2009 implementation. A key event in the cooperative program would be an examination of the readiness and safety assessments conducted by China RMA and technical training as to the roles and functions of an RMA and safety assessments. Representatives from General Administration of Civil Aviation (GACA) of DPR Korea spent the week of 20 April meeting with counterparts from the Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China to have a China-DPRK Coordination meeting for the RVSM implementation in Pyongyang FIR. Review of the readiness and safety assessments and technical training as to the roles and functions of an RMA and safety assessments was conducted by the China RMA with the directors from ATC and AIS Division of GACA.

7.16 The China RMA has completed a comprehensive pre-implementation safety assessment for the RVSM implementation in the Pyongyang FIR. The safety assessment demonstrates that, based on the collected TSD and State RVSM approval data China RMA received, more than 98.88% of the aircraft operations in Pyongyang FIR where RVSM is to be implemented have been conducted by RVSM airworthiness approved aircraft and 98.88% by fully RVSM approved operators and aircraft.

7.17 Based on the collected TSD and LHD reports, the technical risk estimate is $5.62\times10^{-10}$, and the overall risk is $1.66\times10^{-9}$. Both of them were found to satisfy the agreed TLS value of no more than $2.5\times10^{-9}$ and $5.0\times10^{-9}$ fatal accidents per flight hour due to the loss of a correctly established vertical separation standard of 300m (1,000ft) and to all causes, respectively. In addition, the report also defines the risk estimate for ATS route B467 which is the busiest route in Pyongyang FIR. It is found that technical risk is $7.40\times10^{-10}$ and the overall risk is $2.29\times10^{-9}$ fatal accidents per flight hour, which also satisfy the regional TLS.

7.18 RASMAG highly commended the China RMA for the diligent and professional support for the DPRK implementation. With the excellent assistance from China, the work programme was proceeding smoothly and planning was well in hand to meet the October

implementation date. The pre-implementation safety assessment was in the format and of the standard required by RASMAG and demonstrated the strong expectation that the regional target level of safety would be met during implementation.

**RASMAG Review of PBN Regional Plan**

7.19 The RASMAG/10 meeting (December 2008) reviewed the interim edition of the Regional PBN Plan adopted by APANPIRG/19, and proposed additional text for Section 9 - *Safety Assessment & Monitoring Requirements* to clarify that the responsibility for safety assessment and ongoing monitoring lies with the implementing States, not with RASMAG. States were encouraged to coordinate with RASMAG regarding the en-route safety assessment and monitoring requirements and methodologies. RASMAG/10 also proposed a number of editorial updates.

7.20 The PBN/TF/4 meeting (March 2009) reviewed the RASMAG proposals/ recommendations and, with the exception of the text of APANPIRG Conclusion 16/5 that had been included in the RASMAG submission, accepted the proposed changes. The PBN/TF also considered it necessary and appropriate to introduce further changes to some existing text so as to bring more clarity to the document and made a number of additional editorial adjustments to the plan.

**Hong Kong, China – lack of capabilities to conduct PBN safety assessments**

7.21 The Secretariat provided to RASMAG/11 a copy of a working paper that had been submitted by Hong Kong China for the ATM/AIS/SAR Sub-Group meeting in late June. The paper commented that although the responsibility for safety assessment and ongoing monitoring lies with the implementing States, it should be noted that some States in the APAC Region neither have the level of technical expertise nor the resources to conduct PBN safety assessments. Implementation of en-route PBN initiatives in the region would very likely involve concerted efforts by multiple States. Given the scale and complexity of such regional airspace safety assessment, the process would necessarily rely heavily on the assistance provided by the regional RMAs/EMAs under the auspices of ICAO. In particular, Hong Kong, China noted that States in the region do not generally have the experience and expertise in conducting terminal airspace safety assessments and apparently there is little assistance readily available to help those States.

7.22 RASMAG shared many of the concerns raised by Hong Kong, China. The work programme for RASMAG was structured to primarily address vertical and horizontal safety monitoring in international airspaces. As such, PBN en-route implementations were already under the purview of RASMAG and significant effort had already been committed over the past two years to establishing horizontal monitoring capability and guidance by way of the EMA Handbook presently being finalized by RASMAG. Regrettably, RASMAG had been too busy to start to address the long standing data link monitoring requirements that were also under their responsibility and recognized that these matters were long overdue. RASMAG's focus was presently on international airspace and, as terminal area matters were essentially all within the sovereign airspace of States, RASMAG had little capability or capacity to consider this area. This was reflected in the current composition of RASMAG, whose members had only limited terminal area expertise. As such, RASMAG was not in a position to be of any assistance with terminal area matters.

7.23 RASMAG/11 also recalled the laborious efforts undertaken by RASMAG a few years ago to establish fair and efficient mechanisms for the funding of regional airspace safety monitoring. Ultimately, these matters had proven too complex and agreement had been reached through APANPIRG that the parties presently providing vertical and data link monitoring services would continue to absorb the cost on behalf of the States being assisted. Since that time the demand for horizontal monitoring services to service PBN implementation had grown, however funding arrangements were not in place and horizontal monitoring capabilities were very limited regionally. In the opinion of RASMAG, this was an important matter to be addressed in order to ensure adequate safety monitoring could urgently be made available to assist PBN implementation in both the en-route and terminal environments.

7.24 The Sub-Group appreciated the urgent efforts made by RASMAG to consider the working paper from Hong Kong, China before the commencement of the ATM/AIS/SAR Sub-Group meeting. In discussing the issue, the Sub-Group agreed that there was an urgent need for this matter to be progressed as it was clearly a significant impediment to regional implementations of en-route PBN.

7.25 Noting that the Terms of Reference of the PBN/TF already included responsibilities in this respect, notably at items 2), 3), 6) & 7) of the TORs, the Sub-Group considered that it was likely that the PBN/TF was already pursuing a work programme in this respect. The Sub-Group requested that the Secretariat bring the concerns of Hong Kong, China and the comments from RASMAG and the Sub-Group to the attention of the next PBN/TF meeting on 15-17 July 2009 for action.

7.26 On another matter, the Sub-Group noted that the PBN/TF had taken a decision to meet twice a year in the future, and these meetings would be routinely scheduled in January and July. Considering that the RASMAG meetings were routinely held in December and May/June, and the ATM/AIS/SAR Sub-Group meeting was normally held in late June, the schedule adopted for the PBN/TF meetings was likely to make coordination with RASMAG and the Sub-Group cumbersome. In that regard, it was suggested that the PBN/TF consider rescheduling their meetings prior to the RASMAG and ATM/AIS/SAR Sub-Group meetings so that outcomes from the PBN/TF could be considered in a timely manner.

**EMA Handbook**

7.27 Review and comment from the Sub-Group on the *Asia/Pacific En-route Monitoring Agency (EMA) Handbook* (the 'EMA Handbook' – see **Appendix B** to the Report on Agenda Item 7) under final preparation by RASMAG was invited, to reach the Secretariat by 31 July 2009 in order to provide time for the Secretariat to compile and a final version for review by RASMAG participants in time for the September APANPIRG meeting. RASMAG had drafted Conclusion RASMAG 11/2 calling for APANPIRG to adopt the EMA Handbook as regional guidance material.

**Expand December TSD for airspace planning**

7.28 The ATFM Seminar/Workshop (Fukuoka, Japan, 7 to 9 October 2008) recognized that as a result of the Annex 11 provisions requiring that RVSM monitoring be conducted on a regional basis, APANPIRG/16 had endorsed the use of a standardized approach to the sampling of vertical and horizontal traffic data under the terms of Conclusion 16/4, adopting the month of December every year for the collection of a one month traffic sample data by all Asia/Pacific States. Although this data was currently used exclusively for airspace safety monitoring purposes, the ATFM Seminar/Workshop considered it likely that this annual traffic count would provide a very useful source of data for airspace planning purposes in general and specifically to identify peak traffic loadings for ATFM purposes.

7.29 After considering this proposal RASMAG gave in-principle agreement to the concept. However, beyond agreeing to a standardized template for the annual December traffic sample data gathering, regional RMAs were not able to accommodate extra workload or responsibilities in gathering and managing data. Release of data would need to be authorized by an appropriate oversight body, such as the Regional Office. Additionally, RMAs also preferred that wherever possible implementing agencies obtained data directly from the States or parties involved in each implementation. The meeting agreed to the following draft Decision in this respect:

***Draft Decision RASMAG 10/3 – Expand use of safety monitoring data***

*That the arrangements for annual month of December traffic sampling by all States to satisfy airspace safety monitoring analysis as called for by APANPIRG Conclusion 16/4 be expanded to enable this data to also be used for airspace planning and implementation purposes. This will apply only where such data is not otherwise available to regional or State implementing bodies and only with specific authority of the ICAO Asia/Pacific Regional Office.*

**Regional Safety Performance Objective and Metric**

7.30 RASMAG/11 prepared a safety related Asia Pacific Regional Performance Objective and associated performance framework form that was applicable to the activities of RASMAG, formulating draft Conclusion RASMAG 11/4 for consideration by APANPIRG to adopt the safety objective. The meeting noted that this regional performance objective had been incorporated into draft Conclusion 19/1 at paragraph 3.14 and therefore RASMAG Conclusion 11/4 was no longer necessary.

7.31 Similar, the safety metric agreed by RASMAG and proposed in RASMAG draft Conclusion 11/5 had been incorporated into the draft Conclusion 19/3 at paragraph 3.19, superseding RASMAG draft Conclusion 11/5.

**Significant Points**

7.32 In relation to the submissions from RASMAG, the meeting noted the following significant points:

a) In general terms, the regional Target Level of Safety (TLS) for RVSM operations is being widely satisfied across the Asia/Pacific Region;

b) The one year post implementation safety assessment for the implementation of RVSM in the Chinese sovereign airspace demonstrated that the safety performance was satisfying the regional TLS in the vertical dimension;

c) The vertical TLS is not being satisfied in Australian airspace however a beneficial trend is exhibited with risk estimates continuing to improve;

d) The vertical TLS is not being satisfied in the Fukuoka FIR. This is directly attributable to a single long duration (89 minutes) Large Height Deviation which has been investigated and remediated;

e) The Western Pacific/South China Sea airspace now satisfies the TLS, this is due to the focused efforts of the WPAC/SCS RVSM Scrutiny Group over the past 2 years. Noting that the work of WPAC/SCS was essentially complete

and the RSG had recommended itself for dissolution, RASMAG strongly commended the work of the WPAC/SCS RSG;

f) That airspace safety performance was satisfying the regional TLS in the lateral and longitudinal dimensions for the South China Sea parallel route structure;

g) RASMAG has concerns in relation to under reporting of Large Height Deviations in the Bay of Bengal airspace;

h) Persistent examples of non RVSM approved flights 'incorrectly' filing flight plans showing RVSM approval have been identified through the work of the PARMO and AAMA. As this leads ATC to incorrectly apply the reduced separation minima State regulatory intervention is necessary;

i) The single biggest issue leading to Large Height Deviations in the Asia/Pacific RVSM operational environment is that of errors in the ATC Unit-to-ATC Unit coordination interface;

j) RASMAG had recommended formal adoption by APANPIRG of the RVSM Minimum Monitoring Requirements (MMRs) that had been in common use regionally for some years;

k) RASMAG had recommended to APANPIRG that the annual December Traffic sample data (TSD) be made available under the authority of the Regional Office to implementing parties in controlled circumstances to assist regional implementations;

l) The draft *Asia/Pacific Regional Impact Statement – RVSM Global Long Term Height Monitoring Requirements Effective from November 2010* had been prepared and a final version would be presented to APANPIRG/20 in September 2009 for adoption as regional guidance material;

m) In light of the continued non-compliance by States with Conclusion 19/5 in relation to continuously providing RVSM Approvals status to RMAs, RASMAG had recommended that APANPIRG additionally require an annual submission of RVSM Approvals status as part of the annual December traffic sample data submission;

n) The persistence of high numbers of errors in ATC unit to ATC Unit coordination resulting in LHD occurrences in regional RVSM operations and the benefits of automated messaging (including AIDC) in managing this type of problem;

o) The 100 feet misalignment between the feet based flight level orientation scheme and the Annex 2 metric scheme adopted in China did not influence (positively or negatively) RVSM safety performance and should not be reported as LHD;

p) Promising results were available from the ongoing work in relation to using ADS-B data as a methodology for the monitoring of Altimetry System Error (ASE) in RVSM operations;

q) RASMAG had reviewed and commended the technical assistance provided by China RMA to DPRK for the October 2009 RVSM implementation in Pyongyang FIR, noting that the pre-implementation safety assessment satisfied the TLS, the readiness assessment satisfied the requirements and preparations were well advanced for this implementation;

r) RASMAG had recommended that APANPIRG adopt the terminology En-route Monitoring Agency (EMA) in preference to Safety Monitoring Agency (SMA) for horizontal plane assessment and not adopt a formal approvals process for EMAs, instead let RASMAG continue to assess EMA competency;

s) RASMAG reviewed and supported the concerns expressed by Hong Kong, China in relation to the lack of regional capability to conduct the safety assessments for PBN implementations in en-route and terminal environments, and recalled the difficulties experienced with funding of safety monitoring services;

t) The continued preparation of the *Asia/Pacific En-route Monitoring Agency Handbook*, noting that a final version would be presented to APANPIRG/20 in September 2009 for adoption as regional guidance material;

u) RASMAG strongly supported the near term intentions by the United States to proceed with an operational trial of ADS-B In Trail Procedures in the South Pacific;

v) RASMAG strongly supported developmental work being undertaken by the United States with respect to ADS-C In trail Procedures and the intention to proceed to operational trial in the Pacific in the medium term;

w) That the heavy work programme of RASMAG meant that RASMAG was behind schedule in terms of oversight of the safety of data link technical performance and review of Central Reporting Agency analyses; and

x) RASMAG had agreed to a regional safety performance objective with associated safety metric and Performance Framework Form (PFF), for consideration by APANPIRG/20.

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**
**ASIA AND PACIFIC OFFICE**

# *DRAFT*

## ASIA/PACIFIC REGIONAL IMPACT STATEMENT −

## *RVSM GLOBAL LONG TERM HEIGHT MONITORING*

## *REQUIREMENTS EFFECTIVE FROM NOVEMBER 2010*

***Version 1.6– June 2009***

**Issued by the ICAO Asia/Pacific Regional Office, Bangkok**

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# FOREWORD

Since the initial operational implementation of Reduced Vertical Separation Minimum (RVSM) in the North Atlantic in 1998, widespread implementation of RVSM has taken place globally. In the Asia/Pacific Region, implementation commenced as a result of the output of the Third Asia/Pacific Regional Air Navigation Meeting (RAN/3, Bangkok, Thailand 19 April – 7 May 1993) which called for an ICAO RVSM Task Force to progress RVSM implementation in the Pacific. The Ninth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG 9, August 1998) established the Asia/Pacific RVSM Implementation Task Force (RVSM/TF) under the terms of Decision 9/4 and simultaneously adopted Conclusion 9/3 requiring actions to establish an RVSM implementation schedule for the Asia region, in addition to the programme for the Pacific region.

Under the capable stewardship of the RVSM/TF, Asia/Pacific RVSM implementations went forward smoothly commencing with the Pacific area in 2000 and followed by the Western Pacific and South China Sea area during 2002, the Bay of Bengal area in 2003, Japan and the Republic of Korea during 2005 and throughout the airspace of China in 2007. RVSM implementations in the two remaining Asia/Pacific FIRs, Pyongyang and Ulaan Baatar, are scheduled for 2009 and 2012, respectively.

Recognising the significance of the step from a 2000 ft vertical separation minimum to a 1000 ft vertical separation minimum, intensive monitoring arrangements were put in place to ensure the continued safety of RVSM operations. Such monitoring considers RVSM safety performance in terms of two components. Technical risk relates to the technical performance of equipment, including altimetry systems. Operational risk relates to human performance error and, in simple terms, considers errors made by pilots and air traffic controllers.

To be approved for operation in RVSM airspace, States must ensure that aircraft comply with technical requirements that enable the actual height cleared by air traffic services to be accurately maintained. The RVSM monitoring programmes around the world have collected extensive height keeping data to determine the stability of Altimetry System Error (ASE) in airframes used for RVSM operations. The results show that altimetry systems drift is worse than anticipated. Accordingly, provisions have recently been included in Annex 6 – *Operation of Aircraft* that take effect from 2010 and require the global long term monitoring of altimetry systems used for RVSM operations.

APANPIRG/20 (September 2009) has adopted this Asia/Pacific Regional Impact Statement, prepared by the Regional Airspace Safety Monitoring Advisory Group (RASMAG), under the terms of Conclusion 20/XX to provide general guidance to States. Additionally, specific guidance is provided to assist in identifying the ground-based monitoring infrastructure necessary for the regional RVSM monitoring programme, in order that States are better informed when making collaborative decisions about investments in regional infrastructure.

## 1. Introduction

1.1 At the broadest level, Annex 11 – *Air Traffic Services* requires States to establish a safety programme in order to achieve an acceptable level of safety in the provision of Air Traffic Services (ATS). More specific requirements exist for the implementation of safety management systems by Air Navigation Services Providers (ANSPs) that identify hazards, ensure remedial action and provide for the continuous monitoring and regular assessment of the safety level achieved.

1.2 In the specific case of the implementation and ongoing operation of reduced vertical separation minimum (RVSM), Annex 11 requires that for all airspace where a RVSM of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the implementation and continued application of this vertical separation minimum meets the safety objectives. The coverage of the height-monitoring facilities provided under this programme shall be adequate to permit monitoring of the relevant aircraft types of all operators that operate in RVSM airspace. Arrangements shall be put in place, through interregional agreement, for the sharing between regions of data from RVSM monitoring programmes.

1.3 The increasing complexity of requirements and the necessary State interactions led the Fourteenth meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/14, August 2003) to establish the Regional Airspace Safety Monitoring Advisory Group (RASMAG) to provide oversight of airspace safety monitoring requirements, including the monitoring of the height keeping performance of the airframes used in RVSM operations, thereby providing a regional basis for RVSM monitoring in Asia/Pacific. In further addressing its responsibilities in this regard, APANPIRG adopted a Target Level of Safety (TLS) for en-route airspace in the Asia/Pacific region of $5 \times 10^{-9}$ fatal accidents per flight hour in each dimension i.e. vertical, lateral and longitudinal. APANPIRG also continues to encourage cooperative arrangements between States to undertake airspace safety assessments and to provide airspace safety monitoring for the introduction of airspace changes and reduction in aircraft separation minima (vertical and horizontal), as well as for ongoing operations.

## 2. The need for RVSM Monitoring

2.1 Aircraft use a barometric altimeter to determine height and follow common pressure levels (flight levels) using a QNH of 1013 in RVSM airspace. The errors in the aircraft altimetry sensing systems are not apparent during routine operations as the altimeter displays to the aircrew and air traffic systems a level that includes these altimetry system errors (ASE). As such, the presentation to the pilot is often different to the actual height of the aircraft. During routine calibration the aircraft systems are maintained on the ground while at rest, so the dynamic nature of ASE is not seen. Aircraft altimetry systems also employ parts that:

- wear over time (such as the pitot-static probe and portions of internal plumbing); and/or
- are subject to damage (such as skin flexing/deformation during operations); and/or
- are effected by modification of airframes (such as the incorrect application of paint or mounting of accessories in the vicinity of the static pressure port).

2.2 All these activities are capable of producing significant error in true height. Other factors seen in normal operations of high-speed flight such as aerodynamic loading, and exposure to ranges of temperature, moisture and contaminants, are also capable of producing significant variation in the sensed pressure. These errors can vary over the population of operational aircraft of the same type and within each aircraft this error can change with time in service.

2.3 **Figure 1** below details the variations observed in true altitude over the last five years for a single airframe. Note the increased rate of deterioration in the last 10 months of the sample period. **Figure 2** shows the variation in ASE over a fleet of 15 airframes of the same type at about the same period of time

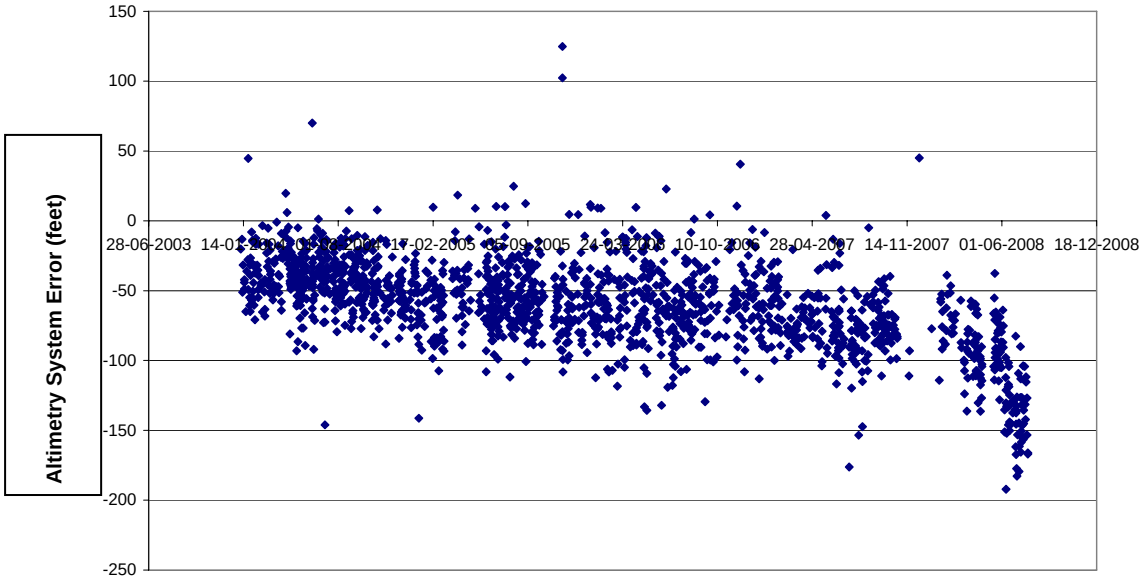


**Figure 1**: Example of single airframe Altimetry System Error degradation over 5 years

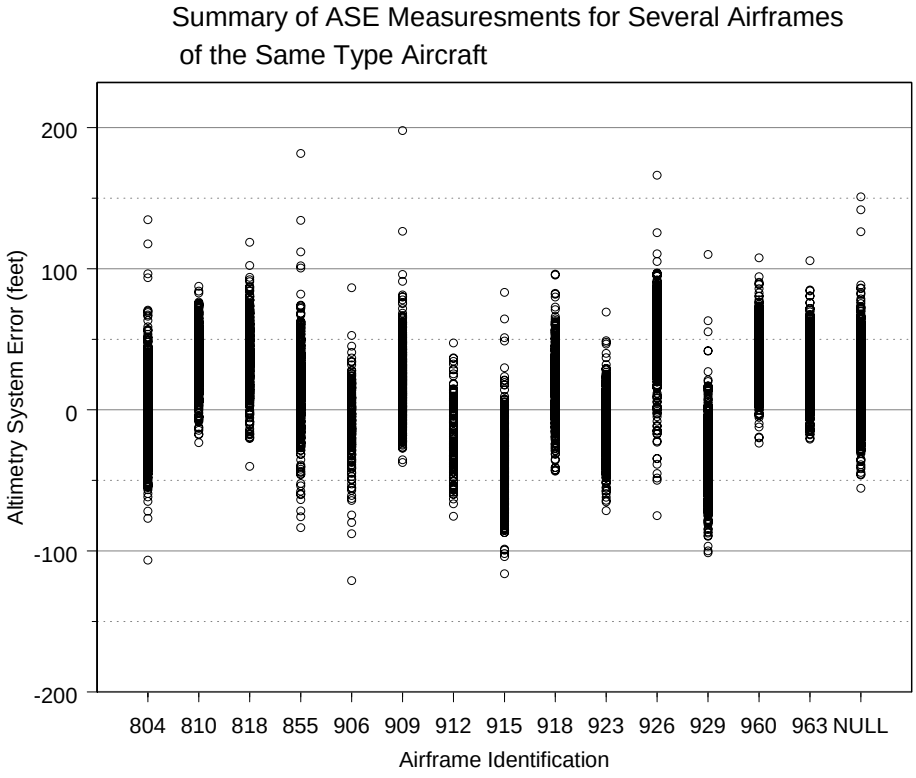


**Figure 2:** Variation of ASE over 15 airframes of same type at a similar point on time.

2.4 Safe RVSM operations demand high accuracy of the altimetry systems and RMAs have evidence that ASE can vary within a population of the same type at any point in time and by individual aircraft over any period of time. To ensure that only high accuracy altimetry systems are in operation, the ICAO Annex 6 monitoring requirements need to be in place by 2010 however it clearly makes for safer operations to implement the long term height monitoring capability without delay.

***Include additional text here that explains the rationale for the Annex 6 sample requirements and periodicity etc. The objective is so that when Operators demand an explanation from RMAs as to why they have to be monitored, RMAs are properly equipped to answer.***

## 3. Asia/Pacific RVSM Monitoring arrangements

3.1 Assessment of the safety performance of RVSM airspace is undertaken by specialist assessment bodies known as Regional Monitoring Agencies (RMAs), which are specifically established to undertake the on-going monitoring of RVSM operations in order to meet ICAO Standards. For the APAC Region, APANPIRG-endorsed RMA services are provided by:

- The Australian Airspace Monitoring Agency (AAMA), operated by Airservices Australia.
- The China RMA, operated by the Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC).
- The JCAB RMA, operated by the Japan Civil Aviation Bureau.
- The Monitoring Agency for the Asia Region (MAAR), operated by Aeronautical Radio of Thailand (AEROTHAI).
- The Pacific Approvals Registry and Monitoring Organization (PARMO), operated by the United States Federal Aviation Administration.

3.2 The Flight Information Regions (FIRs) for which each RMA takes responsibility have been described in the RASMAG *"List of Competent Airspace Safety Monitoring Organizations"*–a copy of which is included as Appendix A.

## 4. Long term RVSM height monitoring requirements

4.1 The ICAO Separation and Airspace Safety Panel (SASP) has identified that height-keeping performance monitoring results for RVSM approved aircraft had, in some cases, demonstrated long-term adverse trends in altimetry system error (ASE) stability. The likely results of this trend, if not reversed, would be aircraft becoming non-compliant with RVSM requirements. Accordingly, to ensure that adverse trends in ASE stability were detected, it was recognised that globally applicable RVSM long-term height monitoring requirements would be necessary.

4.2 As a result of proposals made by the SASP, during 2007 the ICAO Air Navigation Commission (ANC) agreed to amendments to Annex 6 – *Operation of Aircraft* that detail global RVSM long-term monitoring requirements that become effective in November 2010. These requirements state as follows:

> *7.2.7 The State of the Operator that has issued an RVSM approval to an operator shall establish a requirement which ensures that two aeroplanes of each aircraft type grouping of the operator have their height keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If an operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.*

4.3 As a result of the adoption of the Annex 6 requirements above, during May 2009 the SASP proposed a revision to Annex 11 that clarifies the regional component of RVSM monitoring. This proposal is currently under review by the ICAO Secretariat and the ANC, and states as follows:

> *3.3.4.1 For all airspace where a reduced vertical separation minimum of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the ~~implementation and~~ continued application of this vertical separation minimum meets the regional safety objectives. ~~The coverage of the regional height monitoring facilities provided under this programme shall be adequate to permit monitoring of all the relevant aircraft types and all of operators that operate in RVSM airspace.~~ The scope of regional monitoring programmes shall be adequate to conduct analyses of aircraft group performance and evaluate the stability of altimetry system error.*
>
> ~~*Note. -- The number of separate monitoring programmes should be restricted to the minimum necessary to effectively provide the required services for the region.*~~
>
> *3.3.4.2 Arrangements shall be put in place, through inter-regional agreement, for the sharing between regions of data from monitoring programmes.*

4.4 The RASMAG has considered the new requirements for long-term height monitoring in some detail, noting that the provisions will take effect from November 2010 in about a years time. During 2008 RASMAG circulated 6 Long Term Height Monitoring Actions (Appendix B refers) for the attention of Asia/Pacific States and airspace users. Additionally, in relation to the Annex 6 and Annex 11 requirements, RASMAG has agreed that the RVSM **Minimum** Monitoring Requirements (MMRs, see Appendix C for summary of Asia/Pacific MMRs) that had previously been adopted for use by RMAs in the Asia/Pacific Region should continue in use for the time being. In taking this decision, RASMAG recognised that monitoring was a significant burden to operators and should be kept to the minimum necessary. RASMAG therefore agreed to continuously review monitoring results with the objective of migrating to the Annex 6 provisions as the basis for regional MMRs providing that regional safety requirements were not compromised.

4.5 APANPIRG/18 recognized that the 2010 implementation of Annex 6 global long-term monitoring requirements for airframes used in RVSM operations would have significant impacts in the way regional monitoring was managed, including the need for widespread regional height monitoring infrastructure capability to be made available. Under the terms of Conclusion 18/4, APANPIRG tasked Asia/Pacific RMAs in conjunction with RASMAG to prepare this regional impact statement summarizing the estimated consequences for the Region, including consideration of the numbers of airframes required to be monitored and ground monitoring infrastructure required.

## 5. Monitoring of Airframes

5.1 The implementation of long-term height monitoring requirements will place significant additional responsibilities on operators, State approval authorities and RMAs alike. Within the Asia/Pacific Region, the RMAs in conjunction with RASMAG have presently standardised on a set of RVSM MMRs that do not specifically prescribe on-going monitoring requirements after the initial monitoring of operator fleet or single aircraft type operations when an RVSM operational approval is sought by the operator. However, the Annex 6 provisions concern on-going monitoring specifically and, as a result, the current Asia/Pacific MMRs will need to be reviewed to align, to the extent possible, with the monitoring periodicity requirements in Annex 6.

5.2 For the purposes of this assessment in determining the monitoring requirement after November 2010, the Asia/Pacific RMAs have provided approximate numbers of airframes based on the criteria set in the Annex 6 amendment. As a result the total number of airframes to be monitored over the 2 year period ending November 2012 is expected to be about **XXXXX.** A detailed breakdown of this analysis is provided in Appendix D. It should be noted that the number of airframes to be monitored is likely to increase over the medium term as older, non-RVSM capable aircraft are replaced with more modern types with full RVSM capability.

## 6. Ground-Based Monitoring Infrastructure

6.1 The implementation of long-term height monitoring will require significant changes in the monitoring infrastructure to ensure the requirements of Annex 6 are met. Currently within the Asia/Pacific Region, airframe monitoring is undertaken by means of either a ground-based system or a portable unit temporarily mounted in the aircraft.

6.2 In the case of ground-based systems, monitoring is undertaken by aircraft flying in proximity to the Height Monitoring Units (HMUs) in Europe or in North America (where they are known as Aircraft Geometric Height Measurement Elements -AGHMEs) to estimate aircraft ASE. Three HMUs are managed by Eurocontrol, one by the North Atlantic Central Monitoring Agency (NAT CMA), and six AGHMEs by the Pacific Approvals Registry and Monitoring Agency (PARMO) - four in the United States and two in Canada. Ground-based monitoring by these systems is effective for aircraft operated internationally to those continents, and for new aircraft from the major manufacturers.

6.3 In practice, ground-based monitoring can only occur when an aircraft overflies – in level flight - a ground-based monitoring unit or transits the local airspace specifically associated with the unit. This is not convenient in all cases as operators may have to vary flight patterns to overfly a HMU. Therefore ground-based monitoring units should ideally be located at points that are routinely overflown by aircraft engaged in normal scheduled operations, rather than at locations that require aircraft to divert from normal flight paths in order to overfly the ground monitoring unit. At present, there are no operational ground-based monitoring facilities in the Asia/Pacific region.

6.4 The portable GPS Monitoring Unit (GMU) is a carry-on system installed in an aircraft for a single flight. Its main advantage is the ability to monitor an individual aircraft during normal operations without the need to fly over a ground-based monitoring system in a particular portion of airspace. Data files from a GMU must be post-processed to extract aircraft geometric height which must then be combined with other information in order to produce height keeping performance data. GMUs are used by the US FAA, AEROTHAI, ATMB of CAAC and one or two other approved service providers in conjunction with the FAA Technical Center. GMU monitoring is coordinated by RMAs or State approval authorities; it is widely used and effective. However, it can be costly and inconvenient to operators: there are charges for the use of the unit, and its installation and subsequent removal may involve time out of service for the aircraft.

6.5 In recent times the SASP has been progressing work to prove the acceptability of the geometric height data available in ADS-B messages as a cost effective means of monitoring ASE stability. Significant trials undertaken by the FAA in the United States have produced good results and in particular, the Australian Airspace Monitoring Agency (AAMA) operating through Airservices Australia is keen to progress this work given its wide-coverage ADS-B surveillance network and the cost effectiveness of such a system. However, using ADS-B data alone to monitor aircraft ASE will not provide a complete sample of the airspace population unless a mandated ADS-B fitment requirement exists in a particular Region or State. In Australia, for example, such a mandate will become effective in 2013 for all civil aircraft operating above Flight Level 280, but this is not yet the case in most areas of the Asia/Pacific region.

6.6 The advantage of ground-based monitoring systems (HMUs, AGHME or ADS-B) is that they provide large volumes of data and information about the aircraft population and permit repeated measurements on individual airframes, which is highly beneficial in detecting trends in ASE performance. The location of the ground-based monitoring system is very important, as it determines the number of aircraft for which ASE estimates will be produced and further consideration of this issue will need to be undertaken by RASMAG in conjunction with APANPIRG and Asia/Pacific States.

6.7 The advantage of a portable airborne system (GMU) is that it provides the ability to target specific portions of the airspace population to meet immediate needs, however GMU monitoring does not provide the continuous data streams necessary to determine aircraft group performance and ASE stability. Therefore although GMU monitoring addresses the basic MMR, it should be considered only as supplementary to ground-based monitoring.

6.8 Importantly, it should be recognised that the Asia/Pacific States have a large number of aircraft that confine their operations to single State or Regional environments and therefore would rarely be able to benefit from post-initial approval monitoring by the ground-based units in Europe and North America. This is particularly relevant in the cases of Australia, China, and India which have large domestic fleets that are not used for international operations. Of the **XXXXX** airframes expected to be monitored regionally over the 2 year period ending November 2012, it is estimated that less than **YY%** will have access to the European, Canadian or United States ground-based monitoring installations during scheduled services.

6.9 Accordingly, a complete monitoring programme for the Asia/Pacific region should make provision for a combination of ground-based monitoring systems such as the HMU, AGHME and/or, in the future, ADS-B as well as airborne systems such as the GMU. However, recognising the cost of installing, operating and maintaining such systems, regional investment should be kept at the absolute minimum necessary to meet the operational requirements. Since the use of ADS-B systems for height monitoring is still under development and it will be some time before ABS-B is usable as a monitoring alternative, currently proven ground-based monitoring systems will need to be deployed in the Asia/Pacific region as the initial response to the long-term monitoring requirements. Deployment of these systems needs to be closely coordinated with APANPIRG, RASMAG and the Asia/Pacific RMAs to ensure effective monitoring within the Region whilst avoiding unnecessary investment in dedicated monitoring infrastructure.

## 7. Impacts on the Asia/Pacific Region

*Objectives of height monitoring*

7.1 In considering the impact of the Annex 6 and proposed Annex 11 provisions on the Asia/Pacific region, an understanding of the objectives to be achieved by height monitoring is necessary. At the broadest level, the monitoring programme must ensure that the continued operational application of RVSM meets the established safety requirements.

7.2 In order to achieve this primary objective, three subsidiary objectives must be met for the performance monitoring of RVSM. The first is to ensure compliance with a basic RVSM Minimum Monitoring Requirement. The MMR serves as a check that operators initially made changes and continue to maintain aircraft in accordance with manufacturer's recommendations for airworthiness. For this purpose, only a sample of observations from each of the operators' fleets is required and the Annex 6 provisions require the observations to be taken at no less than a two year interval.

7.3 The second objective is to conduct analyses of aircraft group performance, where a group consists of airframes meeting common parameters including essentially identical design, static system source is nominally the same, avionics units are nominally the same etc, as defined in Chapter 4 of the *Manual on Implementation of a 300 m (1000 ft) Vertical Separation Minimum between FL290 and FL410 Inclusive (Doc 9574).* In achieving this objective, a much larger data sample adequate to determine ASE performance is required. Accordingly, enough ASE monitoring data should be captured to be able to assess every monitoring group against RVSM performance requirements routinely throughout the two-year period.

7.4 The final objective requires that in order to fulfil the system performance monitoring required by Chapter 6 of the *Manual on Implementation of a 300 m (1000 ft) Vertical Separation Minimum between FL290 and FL410 Inclusive (Doc 9574)*, as recognised in the amended Annex 11 provisions presently under consideration, the monitoring process should also aim to provide evidence of ASE stability. Sufficient ASE performance data must be available to show that, for the bulk of airframes circulating in the RVSM environment, ASE performance does not vary substantially from the beginning to the end of the two-year period. Such data is obtained from repeated samples on individual airframes throughout the two-year period.

*Portable and ground-based monitoring*

7.5 In terms of meeting the basic MMR, monitoring completed using a portable GMU is acceptable. However, in relation to assessing aircraft group performance and ASE stability, large volumes of data are necessary, including frequent monitoring of the same airframes over a period of time in order to determine typical group performance and identify any long-term adverse trends in ASE stability. Such large volumes of data are only obtainable from a ground-based monitoring installation that is regularly overflown by the relevant airframes. Accordingly, a regional monitoring infrastructure that provides the ability to meet the basic MMR requirements as well as the group performance and ASE stability monitoring requirements is necessary. This involves a mixture of portable GMU and ground-based monitoring capability used in a continuous and well coordinated manner.

*Current Asia/Pacific monitoring capabilities*

7.6 At present, there are no ground-based monitoring installations operating in the Asia/Pacific region. Such facilities are available in some other areas of the world visited regularly by aircraft based in the Asia/Pacific region, and some monitoring results are available to be shared between global RMAs.

7.7 Limited portable GMU monitoring capability is available via Asia/Pacific RMAs - as described in paragraph 6.4 above.

*Appropriate ground-based monitoring locations*

7.8 Clearly, in a region of the size of the Asia/Pacific it is not at all feasible to provide 100% monitoring capabilities in all areas. However, a review of the major international traffic flows (see Appendix E) suggests that appropriate locations for installation of ground-based monitoring systems could include Australia/New Zealand, south-east Asia, north-east Asia, China and India/Pakistan. The availability of ground-based monitoring capabilities in these five areas would adequately serve the majority of international traffic flows, whilst also catering for the disposition and monitoring of the larger domestic fleet operations in Australia, China and India. Adoption of such a ground-based infrastructure could mean that existing regional portable GMU capability is adequate. However, the absence of suitable ground-based infrastructure means that investment in GMU capabilities will be necessary.

7.9 In relation to a ground-based unit in northeast Asia, Japan is already advanced with planning to install three ground-based height monitoring units (HMUs) in the Japanese airspace (i.e. Fukuoka FIR). The first HMU is targeted to commence operations in the second quarter of 2011, the second and the third HMUs will come on stream in the second quarter of 2012.

*Coordination arrangements*

7.10 In an effort to minimise duplications of effort whilst still ensuring compliance with monitoring provisions, effective coordination between RMAs globally, and between RMAs and the States they are serving, is essential. Each Asia/Pacific RMA should examine monitoring results accumulated by all other authorized global RMAs, regardless of region, in order to utilize monitoring results from other regions to avoid duplication and reduce the actual monitoring burden faced by each RMA and operator.

7.11 APANPIRG has already recognised the importance of coordination between RMAs and States, with APANPIRG/19 (September 2008) promulgating the following Conclusion:

> ***Conclusion 19/15 – Enhanced communications between States and RVSM RMAs***
>
> *That, noting the Annex 6 provisions for the global long term monitoring of airframes used in RVSM operations and the critical role of Asia/Pacific RVSM Regional Monitoring Agencies (RMAs) in monitoring the safety of RVSM operations, the Regional Office draw the attention of States to the Long Term Height Monitoring Actions promulgated by RASMAG. In particular, States are encouraged to immediately strengthen relationships with their respective RMAs to ensure that information in relation to RVSM approval status is continuously available to RMAs.*

7.12 Despite Conclusion 19/15, Asia/Pacific RMAs continue to experience difficulties in receiving timely and accurate information (including routine large height deviation [LHD] reporting) from States. In order to enable RMAs to assist States to fulfil their monitoring obligations, it is necessary that States:

a) continuously update RMA databases of operators and aircraft holding State RVSM approvals;

b) enable the expeditious forwarding of all LHD and related reports to RMAs, and

c) ensure availability of current details for State RVSM Point of Contact (POC) officials.

7.13 In the event that adequate compliance with coordination arrangements is not achieved, RASMAG will encourage APANPIRG to place non compliant States on the APANPIRG List of Deficiencies in the ATM/AIS/SAR Fields.

## 8. Conclusions

8.1 The Annex 6 requirements for RVSM long-term height monitoring that take effect from November 2010 will have a significant impact on the way in which such monitoring will be undertaken in the Asia/Pacific region. The RASMAG, in conjunction with the Asia/Pacific RMAs, has determined a probable monitoring burden of **XXXXX** airframes region-wide in the 2 years ending November 2012 and the existing Asia/Pacific RVSM Minimum Monitoring Requirements will need to be reviewed against the amended ICAO documentation.

8.2 Three primary objectives need to be achieved in terms of RVSM height monitoring:

a) Compliance with a basic Minimum Monitoring Requirement (MMR - e.g. two aircraft per type, per operator, per two years),

b) Conduct of analyses of aircraft group performance, and

c) Evaluation of the stability of altimetry system error.

8.3 Achievement of the first objective is via sampling of relatively few airframes at relatively long intervals. Achievement of the other two objectives requires large volumes of data obtained via repeated sampling of airframes over extended periods of time using ground-based monitoring equipment.

8.4 Additional monitoring infrastructure will need to be deployed in the Asia/Pacific Region. A range of proven monitoring systems is currently available, including ground-based fixed installation HMUs and AGHMEs and portable airborne GMUs. A mix of ground-based and portable GMU capability will be required. Although the use of ADS-B for height monitoring purposes is currently under development with trials to date showing encouraging results, it is expected to be some time before ADS-B provides a practical monitoring capability.

8.5 Monitoring conducted using portable GMU equipment achieves a single monitoring result on each occasion that is suitable for compliance with basic MMRs, however the large volumes of data necessary for evaluation of the group performance of aircraft and stability of altimetry systems can only be obtained by frequent monitoring using ground-based monitoring installations.

8.6 Ground-based monitoring can only occur when an aircraft overflies – in level flight - a ground-based monitoring unit or transits the local airspace specifically associated with the unit. Therefore ground-based monitoring units should ideally be located at points that are routinely overflown by aircraft engaged in normal scheduled operations, rather than at locations that require aircraft to divert from normal flight paths in order to overfly the ground monitoring unit.

8.7 States retain responsibility for compliance with Annex provisions, including those relating to RVSM height monitoring. However, an extensive system of APANPIRG approved RMAs has been established in the Asia/Pacific region to assist States in this regard, provided States make the necessary data continuously available to RMAs and comply with relevant RMA requirements. Coordination arrangements have been implemented between global RMAs to enable sharing of global monitoring data.

8.8 However, within the Asia/Pacific Region, present coordination activities by States with their respective RMAs are not adequate. States will be required to comply with related APANPIRG Conclusions, including Conclusion 19/15 and immediately strengthen relationships with their respective RMAs to ensure that information in relation to RVSM approval status is continuously available to RMAs. Should voluntary compliance not be effective, RASMAG will encourage APANPIRG to place non compliant States on the APANPIRG List of Deficiencies in the ATM/AIS/SAR Fields.

8.9 A review of the major international traffic flows suggests that appropriate locations for installation of ground-based monitoring systems could include Australia/New Zealand, south-east Asia, north-east Asia, China and India/Pakistan. The availability of ground-based monitoring capabilities in these five areas would adequately serve the majority of international traffic flows, whilst also catering for the disposition and monitoring of the larger domestic fleet operations in Australia, China and India. Adoption of such a ground-based infrastructure could mean that existing regional portable GMU capability is adequate. However, the absence of suitable ground-based infrastructure means that investment in GMU capabilities will be necessary.

8.10 Japan has already indicated its intention to deploy three HMUs situated within the airspace of Japan, with the first HMU targeted to become operational in 2011.

8.11 APANPIRG, in close coordination with RASMAG and Asia/Pacific RMAs will need to be involved in recommending the types and appropriate locations of monitoring systems to most effectively monitor the Asia/Pacific aircraft population with the least infrastructure investment.

**APPENDIX A**

## APANPIRG Asia/Pacific Airspace Safety Monitoring

## RASMAG LIST OF COMPETENT AIRSPACE SAFETY MONITORING ORGANIZATIONS

The Regional Airspace Safety Monitoring Advisory Group of APANPIRG (RASMAG) is required by its terms of reference to recommend and facilitate the implementation of airspace safety monitoring and performance assessment services and to review and recommend on the competency and compatibility of airspace monitoring organizations. In order to assist in addressing these requirements, RASMAG updates and distributes the following list of competent airspace safety monitoring organizations for use by States requiring airspace safety monitoring services. In the context of the list, abbreviations have meanings as follows:

- RMA – Regional Monitoring Agency – safety assessment and monitoring in the vertical plane (i.e. RVSM);
- EMA – En-route Monitoring Agency – safety assessment and monitoring in the horizontal plane (i.e. RHSM, RNAV10, RNP4);
- CRA – Central Reporting Agency – technical performance of data link systems (i.e. ADS/CPDLC); and
- FIT – FANS 1/A Interoperability/Implementation Team – parent body to a CRA.

***(last updated 12 June 2009)***

| Organisation *(including contact officer)* | State | Competency | Status | Airspace assessed (FIRs) |
|---|---|---|---|---|
| **Australian Airspace Monitoring Agency (AAMA) -**<br>**Airservices Australia**<br><br>Mr Robert Butcher, Operational Analysis Manager, Safety and Environment Group,<br>email robert.butcher@airservicesaustralia.com | Australia | APANPIRG<br>RMA | Current | Brisbane, Honiara, Jakarta, Melbourne, Nauru, Port Moresby and Ujung Pandang FIRs. |
| | | EMA | Current | Brisbane, Melbourne FIRs. |

| Organisation<br>*(including contact officer)* | State | Competency | Status | Airspace assessed (FIRs) |
|---|---|---|---|---|
| **China RMA -**<br>**Air Traffic Management Bureau, (ATMB) of Civil Aviation Administration of China (CAAC)**<br><br>Mr. Tang Jinxiang, Engineer of Safety and Monitoring Technical Group, ATMB<br>e-mail: tangjx@adcc.com.cn | China | APANPIRG RMA | Current | Beijing, Guangzhou, Kunming, Lanzhou, Shanghai, Shenyang, Urumqi and Wuhan FIRs and Sector 01 (airspace over Hainan Island) of the Sanya FIR, Pyongyang. |
| **JCAB RMA -**<br>**Japan Civil Aviation Bureau**<br><br>Mr. Kazunaga Suzuki, Special Assistant to the Director, Flight Procedures and Airspace Program Office<br>email suzuki-k22z@mlit.go.jp | Japan | APANPIRG RMA | Current | Fukuoka FIR |
| | | EMA | Available fourth quarter – 2009 | Fukuoka FIR |
| **Monitoring Agency for the Asia Region (MAAR) – Aeronautical Radio of Thailand LTD**<br><br>Mr. Nuttakajorn Yanpirat, Executive Officer, Systems Engineering,Aeronautical Radio of Thailand Ltd.<br>email: nuttakajorn.ya@aerothai.co.th | Thailand | APANPIRG RMA | Current | Bangkok, Kolkatta, Chennai, Colombo, Delhi, Dhaka, Hanoi, Ho Chi Minh, Hong Kong, Karachi, Kathmandu, Kota Kinabalu, Kuala Lumpur, Lahore, Male, Manila, Mumbai, Phnom Penh, Sanya FIR, Singapore, Taibei, Ulaan Bataar, Vientiane, Yangon FIRs |

| Organisation<br>*(including contact officer)* | State | Competency | Status | Airspace assessed (FIRs) |
|---|---|---|---|---|
| **Pacific Approvals Registry and Monitoring Organization (PARMO) – Federal Aviation Administration (US FAA)**<br><br>Mr. Dale Livingston, Manager, Separation Standards Analysis Team, FAA<br>email: dale.livingston@faa.gov | USA | APANPIRG<br>RMA | Current | Anchorage Oceanic, Auckland Oceanic, Incheon, Nadi, Oakland Oceanic, Tahiti FIRs |
| | | EMA | Current | Anchorage Oceanic, Oakland Oceanic |
| **South East Asia Safety Monitoring Agency (SEASMA) -**<br>**Civil Aviation Authority of Singapore (CAAS)**<br><br>Mr. Kuah Kong Beng, Chief Air Traffic Control Officer<br>email: KUAH_Kong_Beng@caas.gov.sg | Singapore | EMA for South China Sea | Current | Hong Kong, Ho Chi Minh, Kota Kinabalu, Kuala Lumpur, Manila, Sanya and Singapore FIRs |
| **FIT - SEA**<br><br>ICAO Regional Office<br>email icao_apac@bangkok.icao.int<br>&<br>**CRA Japan**<br>Mr. Mitsuo Hayasaka, Deputy Director, Air Traffic Control Association Japan,<br>email:hayasaka@atcaj.or.jp | ICAO Regional Office & CRA Japan | FIT & CRA | Current | South China Sea FIRs |

| Organisation<br>*(including contact officer)* | State | Competency | Status | Airspace assessed (FIRs) |
|---|---|---|---|---|
| **IPACG/FIT**<br><br>Mr. Takahiro Morishima, JCAB Co-Chair<br>email: morishima-t2zg@mlit.go.jp<br>&<br>Mr. Reed Sladen, FAA Co-Chair<br>email reed.b.sladen@faa.gov | Japan & USA | FIT & CRA | Current | North & Central Pacific<br>(Oceanic airspace within Fukuoka FIR, and Anchorage & Oakland FIRs) |
| **CRA Japan**<br><br>Mr. Masahisa Hayashi, Deputy Director, Air Traffic Control Association Japan,<br>email:hayashi@atcaj.or.jp | Japan | CRA | Current | Fukuoka FIR for IPACG/FIT<br>Ho Chi Minh, Manila, Singapore FIRs for FIT-SEA |
| **FIT - BOB**<br><br>ICAO Regional Office<br>email icao_apac@bangkok.icao.int<br>&<br>Mr. Bradley Cornell, Boeing Engineering<br>email Bradley.D.Cornell@Boeing.Com | ICAO Regional Office & Boeing USA | FIT & CRA | Current | Bay of Bengal FIRs, Ujung Pandang and Jakarta FIRs, provides assistance to the members of the Arabian Sea/Indian Ocean ATS Coordination Group (ASIOACG) |
| **ISPACG/FIT**<br><br>Mr. Bradley Cornell, Boeing Engineering<br>email Bradley.D.Cornell@Boeing.Com | Boeing USA | FIT & CRA | Current | South Pacific FIRs and members of the Informal South Pacific ATS Coordination Group (ISPACG) |

**APPENDIX B**

# RASMAG Long Term RVSM Height Monitoring Actions – Asia/Pacific Region

APANPIRG/18 (September, 2007) was of the opinion that work should be undertaken as soon as possible in order to assess the consequences for the Asia/Pacific Region of the implementation of ICAO global long term RVSM height monitoring requirements from 2010 and, under the terms of Conclusion 18/4, requested Asia/Pacific Regional Monitoring Agencies (RMAs) in conjunction with the APANPIRG Regional Airspace Safety Monitoring Advisory Group (RASMAG) to prepare a regional impact statement summarizing the estimated consequences for the Region, including consideration of the numbers of airframes required to be monitored.

In order to progress these matters in a timely fashion, RASMAG/8 (December, 2007) formulated six Long Term Height Monitoring (LTHM) Actions for promulgation, as outlined below. More details in respect to each LHTM Action can be found in the RASMAG/8 report, available from the website of the ICAO Asia/Pacific Office at http://www.bangkok.icao.int/ under the "Meetings" menu.

**LTHM Action 1:** Based on the final draft of the RMA Manual which was expected to be available from June 2008, Asia/Pacific RMAs in conjunction with RASMAG prepare and widely promulgate an information circular detailing, as a minimum, the roles and responsibilities of an RMA, the height monitoring process and equipment required, and the reasons and quantum of the global long term height monitoring requirements.

**LTHM Action 2**: To maintain effective delivery of existing RMA services and facilitate planning specifically designed to prepare for application of global long-term RVSM height monitoring requirements from 2010, each Asia/Pacific RMA should, as a matter of priority, bring to the attention of State regulators the difficulties being experienced by RMAs in receiving timely and accurate information (including routine large height deviation [LHD] reporting) from States. Asia/Pacific RMAs should seek assistance from States in implementing robust processes to:

a) continuously update RMA databases of operators and aircraft holding State RVSM approvals;

b) enable the expeditious forwarding of all LHD and related reports to RMAs, and

c) ensure availability of current details for State RVSM Point of Contact (POC) officials.

**LTHM Action 3:** Whilst recognizing that responsibility for compliance with Annex 6 height monitoring provisions remains the responsibility of States, as soon as practicable each Asia/Pacific RMA, in conjunction with State regulatory authorities and airspace user organizations, should develop a methodology for reviewing the RMA database of RVSM approvals in order to develop and promulgate a list of the minimum height monitoring which must be accomplished by each operator to which the RMA provides services. In preparing this list, account should be taken of special circumstances pertaining to infrequent airspace users recognizing that some operators may be required to complete minimum monitoring requirements which are a function of the proposed 1,000-flying-hour limit rather than the two-year limit.

**LTHM Action 4:** After determining the potential monitoring burden posed by the operators to which it provides service, each Asia/Pacific RMA should examine monitoring results accumulated by all other authorized global RMAs, regardless of region, in order to utilize monitoring results from other regions to avoid duplication and reduce the actual monitoring burden the RMA faces.

**LTHM Action 5:** Each Asia/Pacific Region RMA should, in light of its anticipated height monitoring burden, propose recommendations through RASMAG to APANPIRG useful in determining the regional ground-based and GPS-based Monitoring System (GMS) height monitoring infrastructure necessary to enable its affiliated operators to meet the global long-term RVSM monitoring requirements applicable from November 2010.

**LTHM Action 6:** Asia/Pacific RMAs collaboratively investigate the technical feasibility of using the aircraft geometric height produced by ADS-B and Multilateration surveillance systems to support monitoring of aircraft height keeping performance.

## APPENDIX C

## SUMMARY OF ASIA/PACIFIC RVSM MINIMUM MONITORING REQUIREMENTS (MMRs):

1. UPDATE OF MONITORING REQUIREMENTS TABLE AND WEBSITE. As significant data is obtained, monitoring requirements for specific aircraft types may change. When the table is updated, a letter will be distributed to States and operators. The updated table will be posted on the websites of the APAC Regional Monitoring Agencies (RMAs) on behalf of the International Civil Aviation Organization (ICAO) Asia-Pacific Regional Planning Group (APANPIRG).

2. INITIAL MONITORING. All operators that operate or intend to operate in airspace where RVSM is applied are required to participate in the RVSM monitoring programme. The attached table 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 include a plan that demonstrates the process that will be used to meet 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 shall be coordinated with the State authority.

4. APPLICABILITY OF MONITORING FROM OTHER REGIONS. Monitoring data obtained in conjunction with RVSM monitoring programmes from other regions can be used to meet Asia/Pacific monitoring requirements. Asia/Pacific RMAs have 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 attached table. Monitoring will be carried out in accordance with this table.

6. AIRCRAFT GROUPS NOT LISTED IN THE TABLE. Contact the RMA responsible for the State of registration for clarification if an aircraft group is not listed in the Minimum Monitoring Requirements table 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 as an appendix to this Minimum Monitoring Requirements document. 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 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 table, 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 tables.

10. FOLLOW-ON MONITORING. Monitoring is an on-going program that will continue indefinitely after the RVSM approval process. A follow-on sampling program for additional operator aircraft will be coordinated by the Asia-Pacific Regional Airspace Safety Monitoring Advisory Group (RASMAG).

| **MONITORING IS REQUIRED IN ACCORDANCE WITH THIS TABLE, 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.<br>**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)],<br>[A312 (PW), A313 (PW)], A318, [A319, A320, A321], [A332, A333], [A342, A343], A344, A345, A346<br><br>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<br><br>CL60(600/601), CL60(604), C560, [CRJ1, CRJ2], CRJ7, DC10, [E135, E145], [E170, E190], F100, GLF4, GLF5, LJ60<br><br>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**<br><br>** Note. For the purposes of monitoring, aircraft within brackets [ ] 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:<br><br>A124, A388, 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.**<br><br>(*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).<br>** Refer to aircraft group table for detail on C550 monitoring |
| **3** | Non-Group<br>**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**<br>**6 months after the issue of RVSM operational approval.** |

**APPENDIX D**

**Estimated RVSM Monitoring Burden For Asia/Pacific Region As a Result of Long Term Height Monitoring Requirements of Annex 6 - Period from Nov 2010 to Nov 2012**

*(Data estimated by Asia/Pacific RVSM Regional Monitoring Agencies RMAs)*

## AAMA – Australian Airspace Monitoring Agency (Airservices Australia)

| Responsible State | Operator | MMR Category (1,2 or 3) | Aircraft Monitoring Group (e.g. [A34,A343]) | Total Aircraft Type Count | Resultant Monitoring Burden |
|---|---|---|---|---|---|
| **Australia** | | 1 | | | |
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| Total | | | | | |
| **Papua New Guinea** | | | | | |
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| Total | | | | | |
| Grand Total | | | | | |

## China RMA – Air Traffic Management Bureau (ATMB)
## of Civil Aviation Administration of China (CAAC)

| Responsible State | Operator | MMR Category (1,2 or 3) | Aircraft Monitoring Group (e.g. [A34,A343]) | Total Aircraft Type Count | Resultant Monitoring Burden (# airframes) |
|---|---|---|---|---|---|
| **China** | | 1 | | | |
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| Grand Total | | | | | |

## JCAB RMA - Japan Civil Aviation Bureau

| Responsible State | Operator | MMR Category (1,2 or 3) | Aircraft Monitoring Group (e.g. [A34,A343]) | Total Aircraft Type Count | Resultant Monitoring Burden (# airframes) |
|---|---|---|---|---|---|
| **Japan** | | 1 | | | |
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| Total | | | | | |
| Grand Total | | | | | |

## MAAR – Monitoring Agency for the Asia Region (AEROTHAI)

| Responsible State | Operator | MMR Category (1,2 or 3) | Aircraft Monitoring Group (e.g. [A34,A343]) | Total Aircraft Type Count | Resultant Monitoring Burden (# airframes) |
|---|---|---|---|---|---|
| **(include names of MAAR States here)** | | 1 | | | |
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| Total | | | | | |
| **(include names of MAAR States here)** | | | | | |
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| Total | | | | | |
| Grand Total | | | | | |

## PARMO- Pacific Approvals Registry and Monitoring Organization (USA FAA)

| Responsible State | Operator | MMR Category (1,2 or 3) | Aircraft Monitoring Group (e.g. [A34,A343]) | Total Aircraft Type Count | Resultant Monitoring Burden (# airframes) |
|---|---|---|---|---|---|
| **Fiji** | | 1 | | | |
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| Total | | | | | |
| **United States** | | | | | |
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| Total | | | | | |
| Grand Total | | | | | |

# Overall Asia/Pacific – Estimated Total Monitoring Burden

| | |
|---|---|
| Asia Pacific Regional Total | |

# *DRAFT*

**REGIONAL AIRSPACE SAFETY MONITORING ADVISORY GROUP**

# ASIA/PACIFIC

# EN-ROUTE MONITORING AGENCY (EMA)

# HANDBOOK

# VERSION 1.3

## FOREWORD

The Regional Airspace Safety Monitoring Advisory Group (RASMAG) was established during 2004 by the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) to achieve a regional approach for coordination and harmonization of airspace safety monitoring activities, and to provide assistance to States in this respect. The RASMAG 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 had requirements for monitoring other air traffic management (ATM) services, such as reduced horizontal separation based on performance based navigation (PBN), or for monitoring of air traffic services (ATS) data link systems. For RVSM, a handbook with detailed guidance on the requirements for establishing and operating Regional Monitoring Agencies (RMA) had been developed by the ICAO Separation and Airspace Safety Panel (SASP), with the intent that the handbook be applied globally. There was no comparable global document under development by ICAO for the continued safe use of a horizontal-plane separation minimum where PBN is applied.

ICAO provisions require that the implementation of specified reduced separation minima, e.g. 50-NM lateral separation based on PBN RNAV 10, 50-NM longitudinal separation based on PBN RNAV 10 and Direct Pilot Controller Communication (DCPC), and 30 NM lateral and longitudinal separation based on Automatic Dependent Surveillance (ADS), Controller Pilot Data Link Communication (CPDLC) and PBN RNP 4, must first meet safety management system requirements and undergo a safety assessment based on collision risk modelling to confirm that the regionally established target level of safety (TLS) has been met for the airspace. Additionally, periodic safety reviews must be performed in order to permit continued operations. To date, the performance of safety assessments and continued monitoring for reduced horizontal separation minima had been carried out by a few specialized teams made up of technical experts and contractors supporting States within the region.

Under Decision 16/1, APANPIRG had adopted the term Safety Monitoring Agency (SMA) to mean an organization approved by regional agreement to provide airspace safety monitoring and implementation services for international airspace in the Asia/Pacific region for implementation and operation of reduced horizontal separation. Reference to the term SMA was subsequently amended by RASMAG and adopted by APANPIRG (Decision 20/XX) to En-route Monitoring Agency (EMA). The RASMAG agreed that there was a need to develop a handbook aimed at standardizing the principles and practices of such EMAs, in order to ensure the continued safe application of reduced horizontal separation standards in international airspace. Inclusion of the previously independent RNP and RNAV concepts under ICAO's global PBN concept has led to uncertainty amongst States regarding the monitoring requirements for new separation minima implementations where these minima are based on PBN approvals. In anticipation of more widespread use of the PBN RNAV 10 and RNP 4 navigation specifications within the international airspace of the Asia/Pacific Region, this handbook is being provided to identify the monitoring requirements and related EMA duties and responsibilities associated with those navigation specifications and the reduced separation minima which may be implemented based upon compliance with them. It should be noted that, with the exception of 50-NM lateral separation, introduction of the reduced horizontal minima necessitates satisfaction of explicit communications and surveillance requirements as well as the navigation performance requirements.

It is intended that this handbook will introduce a common set of principles and practices for monitoring in connection with reduced horizontal-plane separation minima based on the application of PBN. The handbook will also help to promote an interchange of information among Asia/Pacific States in support of achieving common operational monitoring procedures and of pooling data resulting from application of those procedures. Accordingly, APANPIRG has adopted the EMA Handbook under the terms of Conclusion 20/XX as Asia Pacific regional guidance material.

The Handbook is presented in two parts. Part 1 defines an EMA, describes its functions by means of a list of duties and responsibilities, and identifies the process by which an organization receives credentials as an EMA. Part 2 provides specific guidance to assist an EMA in carrying out the duties and responsibilities presented in Part 1.

**TABLE OF CONTENTS**

**Includes appendices**

1) **SCS implementation safety assessment**
2) **SCS Know your airspace analysis**
3) ***Reformat all the forms in the appendices***

## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADS | Automatic dependent surveillance |
| ANSP | Air navigation service provider |
| APANPIRG | Asia Pacific Air Navigation Planning and Implementation Regional Group |
| ATC | Air traffic control |
| ATM | Air traffic management |
| ATS | Air traffic services |
| CPDLC | Controller pilot data link communication |
| CRM | Collision risk model |
| EMA | En-route Monitoring Agency |
| FIR | Flight Information Region |
| FTP | File transfer protocol |
| ICAO | International Civil Aviation Organization |
| LLD | Large lateral deviation |
| LLE | Large longitudinal error |
| MASPS | Minimum aviation system performance standard |
| NM | Nautical miles |
| PBN | Performance-based navigation |
| RASMAG | Regional Airspace Safety Monitoring Advisory Group of APANPIRG |
| RMA | Regional Monitoring Agency |
| RNAV | Area navigation |
| RNP | Required navigation performance |
| RVSM | Reduced vertical separation minimum |
| SASP | Separation and Airspace Safety Panel |
| SSR | Secondary surveillance radar |
| STC | Supplemental Type Certificate |
| TLS | Target level of safety |

## EXPLANATION OF TERMS

***Collision risk.***
The expected number of mid-air collisions in a prescribed volume of airspace for a specific number of flight hours due to loss of planned separation. (*Note: One collision is considered to produce two accidents.)*

***Core (lateral) navigational performance.***
That portion of overall navigational performance which accounts for the bulk of observed lateral errors and which can be characterized by a single statistical distribution, usually symmetric about the mean lateral error with the frequency of increasing-magnitude errors decaying at least exponentially.

***Exclusionary PBN airspace.***
Airspace in which flight cannot be planned by civil aircraft which do not hold a valid PBN approval from the appropriate State authority.

***Horizontal separation.***
The spacing provided between aircraft in the horizontal plane to avoid collision.

***Large lateral deviation (LLD).***
Any deviation of 15 NM or more to the left or right of the current flight-plan track.

***Large longitudinal error (LLE).***
Any unexpected change in longitudinal separation between an aircraft pair, or for an individual aircraft the difference between an estimate for a given fix and the actual time of arrival over that fix, as applicable, in accordance with the criteria set out below:

| Type of Error | Category of Error | Criterion for Reporting |
|---|---|---|
| Longitudinal deviation | Aircraft-pair (Time-based separation applied) | Infringement of longitudinal separation standard based on routine position reports |
| Longitudinal deviation | Aircraft-pair (Time-based separation applied) | Expected time between two aircraft varies by 3 minutes or more based on routine position reports |
| Longitudinal deviation | Individual-aircraft (Time-based separation applied) | Pilot estimate varies by 3 minutes or more from that advised in a routine position report |
| Longitudinal deviation | Aircraft-pair (Distance-based separation applied) | Infringement of longitudinal separation standard, based on ADS, radar measurement or special request for RNAV position report |
| Longitudinal deviation | Aircraft-pair (Distance-based separation applied) | Expected distance between an aircraft pair varies by 10NM or more, even if separation standard is not infringed, based on ADS, radar measurement or special request for RNAV position report |

***Occupancy.***
A parameter of the collision risk model which is twice the count of aircraft proximate pairs in a single dimension divided by the total number of aircraft flying the candidate paths in the same time interval.

***Operational Approval.***
An approval granted to an operator by the State authority after being satisfied that the operator meets specific aircraft and operational requirements.

***Operational risk.***
The risk of collision due to operational errors and in-flight contingencies.

***Overall risk.***
The risk of collision due to all causes, which includes the technical risk and the operational risk.

***Passing frequency.***
The frequency of events in which the centers of mass of two aircraft are at least as close together as the metallic length of a typical aircraft when traveling in the opposite or same direction on adjacent routes separated by the planned lateral separation at the same flight level.

***Target level of safety (TLS).***
A generic term representing the level of risk which is considered acceptable in particular circumstances.

***Technical Risk***
The risk of collision associated with aircraft navigation performance.

**Part 1**

# 1 Description of a En-route Monitoring Agency, Its Functions and Establishment

## 1.1 Description

1.1.1 An En-route Monitoring Agency (EMA) is an organization providing airspace safety assessment and monitoring services to support the introduction and continued safe use of en-route horizontal-plane separation minima. An EMA comprises a group of specialists who carry out specific functions to provide these services. These functions are shown in the following set of EMA duties and responsibilities.

## 1.2 EMA Duties and Responsibilities

1.2.1 The duties and responsibilities of an EMA are:

1.2.1.1 to establish and maintain a database of operational approvals specific to the horizontal-plane separation applied in the EMA's area of responsibility;

1.2.1.2 to coordinate monitoring of horizontal-plane navigational performance and the identification of large horizontal-plane deviations;

1.2.1.3 to receive reports of large horizontal-plane deviations identified during monitoring; to take the necessary action with the relevant State authority and operator to determine the likely cause of the horizontal-plane deviation and to verify the approval status of the relevant operator;

1.2.1.4 to analyze data to detect horizontal-plane deviation trends and, hence, to take action as in the previous item;

1.2.1.5 to undertake data collections as required by RASMAG to:

a) investigate the navigational performance of the aircraft in the core of the distribution of lateral deviations;

b) establish or add to a database on the lateral navigational performance of:

- the aircraft population
- aircraft types or categories
- individual airframes;

c) examine the forecast accuracy of aircraft-provided times at future required reporting points

1.2.1.6 to archive results of navigational performance monitoring and to conduct scheduled risk assessments in light of agreed regional safety goals;

1.2.1.7 to contribute to a regional database of monitoring results;

1.2.1.8 to initiate necessary remedial actions and coordinate with specialist groups as necessary in the light of monitoring results;

1.2.1.9 to monitor the level of risk as a consequence of operational errors and in-flight contingencies as follows:

a) determine, wherever possible, the root cause of each deviation together with its size and duration;

b) calculate the frequency of occurrence;

c) assess the overall risk in the system against the overall safety objectives; and

d) initiate remedial action as required;

1.2.1.10 to initiate checks of the approval status of aircraft operating in the relevant airspace where horizontal-plane separation is applied, identify non-approved operators and aircraft using the airspace and notify the appropriate State of Registry/State of the Operator accordingly; and

1.2.1.11 to submit reports as required to APANPIRG through RASMAG.

## 1.3 Process for Establishing an EMA

1.3.1 An organization proposing to offer EMA services must be approved by the RASMAG.

1.3.2 In order to effectively carry out the duties and responsibilities of an EMA, an organization must be able to demonstrate an acceptable level of competence. Competence may be demonstrated by:

a) previous monitoring experience; or

b) participation in ICAO technical panels or other bodies which develop horizontal separation requirements or criteria for establishing separation minima based on PBN; or

c) establishment of a formal relationship with an organization qualified under (a) or (b).

1.3.3 Once competence has been demonstrated, the EMA should receive a formal approval by RASMAG.

1.3.4 Appendix A lists the RASMAG EMAs and the FIRs for which they are responsible.

# Part 2

## 2. Guidance on the Responsibilities and Standardised Practices of En-route Monitoring Agencies

### 2.1 Purpose of this part

2.1.1 The purpose of this part of the Handbook is to document experience gained by organizations supporting the introduction of reduced horizontal-plane separation minima within the Asia and Pacific Region, and elsewhere, in order to assist an EMA in fulfilling its responsibilities. Where necessary to ensure standardized practices among EMAs, detailed guidance is elaborated further in appendices.

### 2.2 Establishment and Maintenance of a Database of PBN and Other Necessary Approvals

2.2.1 The experience gained through the introduction of RVSM within Asia/Pacific has shown that the concept of utilising monitoring agencies is essential to ensure safety in the region. They have a significant role to play in all aspects of the safety monitoring process. One of the functions of an EMA is to establish a database of operators and aircraft or aircraft types approved by their respective State authorities for PBN operations and, if necessary, for use of data link in the region for which the EMA has responsibility. This information is of vital importance in effectively assessing the risk in the airspace.

2.2.2 Aviation is a global industry; many operators may be approved for PBN and data link operations and their approvals registered with an EMA operating in a region where reduced horizontal separation has been implemented. Thus, there is considerable opportunity for information sharing among EMAs. While a region or sub-region introducing reduced horizontal-plane separation may need its own EMA to act as a focal point for the collection and collation of approvals for aircraft operating solely in that region, it may not need to maintain a complete database of all approved aircraft in the world. It will, however, be required to establish links with other EMAs in order to determine the PBN and/or data link status of aircraft, so that an assessment of the technical risk can be made.

2.2.3 To avoid duplication by States in registering approvals with EMAs, the concept of a designated EMA for the processing of approval data has been established. Under the designated EMA concept, all States are associated with a specified EMA for the reporting of PBN and data link approvals. Appendix B provides a listing of States and the respective designated EMA for PBN and data link approvals. EMAs may contact any State to address safety matters without regard to the designated EMA for approvals.

2.2.4 It is important to note that, in general, the aircraft operating in airspace where implementation of PBN-based separation is planned can be grouped into two categories. Some aircraft operate solely within the airspace targeted for introduction of reduced separation standards (and therefore may not have PBN and other required approval status), and others operate both within that airspace and other portions of airspace requiring PBN and other approvals. It is the responsibility of the EMA supporting introduction of reduced separation to gather State approvals data for the former category of aircraft from authorities responsible for issuing those approvals. To do so requires the EMA to establish a communication link with each such State authority and to provide a precise description of the approvals information required. Appendix C provides typical forms, with a brief description of their use, that an EMA might supply to a State authority to obtain information on aircraft PBN or data link approval status.

2.2.5 Where possible, the EMA should collect State approvals information for the latter category of aircraft – those already operating in other airspace where reduced horizontal-plane separation minima are applied – from other EMAs. This collection will be facilitated if each EMA maintains, in a similar electronic form, a database of State PBN and data link approvals.

2.2.6 Appendix D contains the minimum database content required and the format in which it should be maintained by an EMA. Appendix D also contains a description of the data to be shared by EMAs and the procedures for sharing.

## 2.3 Monitoring of Horizontal-Plane Navigation Performance

2.3.1 An EMA must be prepared to collect the information necessary to monitor horizontal-plane navigational performance as part of the risk assessment. It must institute procedures to monitor core navigational performance and to collect information descriptive of large deviations and operational errors in the horizontal plane.

*Monitoring Core Navigational Performance*

2.3.2 The EMA will investigate the navigational performance of the aircraft in the core of the distribution of lateral deviations by comparing aircraft reported position information with non-aircraft generated position information such as radar data. The EMA analysis of core navigation performance contributes to the determination of lateral overlap probability used in conducting a safety assessment. An EMA must enlist the cooperation of States and air navigation service providers (ANSPs) in monitoring horizontal-plane core navigational performance through the use of secondary surveillance radar or other appropriate surveillance systems. States and ANSPs have the responsibility to cooperate with the EMA and supply any requested data that will contribute to the evaluation of core navigational performance.

*Monitoring the Occurrence of Large Lateral Deviations and Large Longitudinal Errors*

2.3.3 Experience has shown that LLDs and LLEs have had significant influence on the outcome of safety assessments before and after implementation of PBN-based separation in a portion of airspace. Accordingly, a principal duty of an EMA is to ensure the existence of a program to collect this information, assess the occurrences and initiate remedial action to correct systemic problems. Section 2.6 provides guidance to an EMA for initiating such remedial actions as may be necessary to resolve systemic problems uncovered by this program. One way to ensure the existence of such a program is to develop letters of agreement between States.

2.3.4 A program to assess the occurrence of LLDs and LLEs will usually include a regional Scrutiny Group to support the EMA monitoring function. A Scrutiny Group is comprised of operational and technical subject matter experts that support the evaluation and classification of LLDs and LLEs. Scrutiny Group guidance is contained in Appendix XX.

2.3.5 Within the airspace for which it is responsible, each ANSP will need to establish the means to detect and report the occurrence of large horizontal-plane deviations. Experience has shown that the primary sources for reports of large horizontal-plane deviations are the ATC units providing air traffic control services in the airspace where reduced separation is or will be applied. The surveillance information available to these units – in the form of voice or ADS reports and, where available, surveillance radar or ADS-B returns – provides the basis for identifying large horizontal-plane deviations. A program for identifying large horizontal-plane deviations should be established and ATC units should report such events monthly. A suggested form for these monthly reports is shown in Appendix E. These reports should contain, as a minimum, the following information:

a) Reporting unit

b) Location of deviation, either as latitude/longitude or ATC fix

c) Date and time of large horizontal-plane deviation

d) Sub-portion of airspace, such as established route system, if applicable

e) Flight identification and aircraft type

f) Actual flight level or altitude

g) Horizontal separation being applied

h) Size of deviation

i) Duration of large deviation

j) Cause of deviation

k) Any other traffic in potential conflict during deviation

l) Crew comments when notified of deviation

m) Remarks from ATC unit making report

2.3.6 Other sources for reports of large horizontal-plane deviations should also be explored. An EMA is encouraged to determine if operators within the airspace for which it is responsible are willing to share pertinent summary information from internal safety oversight databases. In addition, an EMA should enquire about access to State databases of safety incident reports which may be pertinent to the airspace. An EMA should also examine voluntary reporting safety databases, where these are available, as possible sources of large horizontal-plane deviations incidents in the airspace for which it is responsible.

2.3.7 While an EMA will be the recipient and archivist for reports of large horizontal-plane deviations, it is important to note that an EMA alone cannot be expected to conduct all activities associated with a comprehensive program to detect and report large horizontal-plane deviations. Rather, an EMA should enlist the support of RASMAG, the ICAO regional office, appropriate implementation task forces, or any other entity that can assist in the establishment of such a program.

## 2.4 Conducting Safety Assessments and Reporting Results

*Safety Assessment*

2.4.1 A safety assessment conducted by an EMA consists of estimating the risk of collision associated with the horizontal-plane separation standard and comparing this risk to the established TLS. Examples of CRMs used in the development of separation minima are included in Appendix H of this document and in the ICAO Doc 9689 *Manual of Airspace Planning Methodology for the Determination of Separation Minima*. An EMA will need to acquire an in-depth knowledge of the use of the airspace within which the horizontal-plane separation has been implemented. Experience has shown that such knowledge can be gained through acquisition of charts and other material describing the airspace, and through periodic collection of samples of traffic movements within the airspace.

2.4.2 RASMAG will determine the safety reporting requirements for the EMA.

*Establishing the Competence Necessary to Conduct a Safety Assessment*

2.4.3 Conducting a safety assessment is a complex task requiring specialized skills which are not practiced widely. As a result, prior to receiving RASMAG approval to operate as an EMA, the organization will need to demonstrate the necessary competence to complete the required tasks.

2.4.4 Ideally, an EMA will have the internal competence to conduct a safety assessment. However, recognizing that personnel with the required skills may not be available internally, an EMA may find it necessary to augment its staff, either through arrangements with another EMA or with an external (i.e. non EMA) organization possessing the necessary competence.

2.4.5 If it is necessary to use an external organization to conduct a safety assessment, an EMA must have the competence to judge that such an assessment is done properly. This competence could be acquired through an arrangement with an EMA which has conducted safety assessments.

2.4.6 An EMA will need to take into account that a safety assessment must reflect the factors which influence collision risk within the airspace where the reduced horizontal-plane separation will be applied. Thus, an EMA will need to establish a method to collect and organize pertinent data and other information descriptive of these airspace factors. As will be noted below, some data sources from other airspace where reduced horizontal-plane separation has been implemented may assist an EMA in conducting a safety assessment. However, an EMA may not use the safety assessment results from another portion of airspace as the sole justification for concluding that the TLS will be met in the airspace where the EMA has safety assessment responsibility.

Assembling a sample of traffic movements from the airspace

2.4.7 Samples of traffic movement data should be collected for the entire airspace where reduced horizontal-plane separation will be implemented. As a result, ANSPs providing services within the airspace are required to cooperate in providing this data.

2.4.8 In planning the timing and duration of a traffic movement data sample, an EMA should take into account the importance of capturing any periods of heavy traffic flow which might result from seasonal or other factors. The duration of any traffic sample should be at least 30 days, with a longer sample period left to the judgment of an EMA. (Note: by agreement, traffic sample data within the Asia-Pacific Region is collected by all States for the month of December each year for purposes of RVSM monitoring. EMAs may wish to arrange for the augmentation of this sample to enable them to carry out their monitoring activity.)

2.4.9 The following information should be collected for each flight in the sample:

a) date of flight

b) flight identification or aircraft call sign, in standard ICAO format

c) aircraft type conducting the flight, as listed in the applicable edition of ICAO Doc 8643, Aircraft Type Designators

d) aircraft registration mark, if available

e) origin aerodrome, as listed in the applicable edition of ICAO Doc 7910, Location Indicators

f) destination aerodrome, as listed in the applicable edition of ICAO Doc 7910, Location Indicators

g) entry point (fix or latitude/longitude) into the airspace

h) time at entry point

i) flight level (and assigned Mach number if available) at entry point

j) exit point from the airspace

k) time at exit point

l) flight level (and assigned Mach number if available) at exit point

m) additional fix/time/flight-level combinations that the EMA judges are necessary to capture the traffic movement characteristics of the airspace

2.4.10 Where possible, in coordinating collection of the sample, an EMA should specify that information be provided in electronic form (for example, in a spreadsheet). Appendix F contains a sample specification for collection of traffic movement data in electronic form, where the entries in the first column may be used as column headings on a spreadsheet template.

2.4.11 Acceptable sources for the information required in a traffic movement sample could include one or more of the following: ATC observations, ATC automation system data, automated air traffic management system data and secondary surveillance radar (SSR) reports.

Data Link Performance Monitoring

2.4.12 Applications specific to communication systems required for PBN-based operations such as data link introduce operational and technical risk into the system. Therefore end-to-end safety performance monitoring of air-ground and ground-air data link communication services should be ongoing, in accordance with the information contained in the *Guidance Material for End-to-End Safety and Performance Monitoring of Air Traffic Service (ATS) Data Link Systems in the Asia/Pacific Region***,** issued by the ICAO Asia and Pacific Office, Bangkok. .- In the assessment of risk levels, an EMA may find it necessary to use datalink performance data by Central Reporting Agencies (CRAs).

2.4.13 The following communication and surveillance performance elements could be considered for evaluation in a CRA analysis :

a. Position reporting methods and usage
b. Flight plans and data link capabilities
c. ADS downlink message traffic
d. ADS downlink transit times
e. ADS uplink message traffic
f. ADS uplink transit and response times
g. Anomalies identified in ADS data
h. Uplink messages with no response
i. CPDLC uplink and downlink message traffic, including response times
j. Communication service provider outages and the effect on data link performance

*Agreed Process for Determining Whether the TLS is satisfied as the Result of a Safety Assessment*

2.4.13 “Technical risk” is the term used to describe the risk of collision associated with aircraft navigation performance. Some of the factors which contribute to technical risk are:

a) errors in aircraft navigation systems; and

b) aircraft equipment failures resulting in unmitigated deviation from the cleared flight path, including those where not following the required procedures further increases the risk.

2.4.14 "Operational risk" is the term used to describe the risk of collision due to operational errors and in-flight contingencies. The term "operational error" is used to describe any horizontal deviation of an aircraft from the correct flight path as a result of incorrect action by ATC or the flight crew. Examples of such actions are:

a) a flight crew misunderstanding an ATC clearance, resulting in the aircraft operating on a flight path other than that issued in the clearance;

b) ATC issuing a clearance which places an aircraft on a flight path where the required separation from other aircraft cannot be maintained;

c) a coordination failure between ATC units in the transfer of control responsibility for an aircraft, resulting in either no notification of the transfer or in transfer at an unexpected transfer point;

d) weather deviation (Note: these deviations may be instances where the aircraft captain initiates the manoeuvre using operational authority but without advising ATC, and are not necessarily deemed as being incorrect action).

2.4.15 The TLS which must be satisfied is established by regional agreement and documented in the Regional Supplementary Procedures (Doc 7030). The generic Asia/Pacific TLS is presently established, for each dimension (lateral, longitudinal and vertical), as $5 \times 10^{-9}$ fatal accidents per flight hour due to loss of planned separation; however, specific TLS values may be determined by ICAO for application of a particular separation minimum.

## 2.5 Monitoring Operator Compliance with State Approval Requirements

2.5.1 The overall intent of post-implementation EMA activities is to support continued safe use of the reduced horizontal-plane separation. One important post-implementation activity is monitoring operator compliance with State approval requirements by carrying out periodic checks of the approval status of operators and aircraft using airspace where PBN-based separation is applied. This is vital if reduced separation is applied on an exclusionary basis, that is, if State PBN and data link approval is a prerequisite for use of the airspace.

2.5.2 An EMA will require two sources of information to monitor operator compliance with State approval requirements: a listing of the operators, and the type and registration marks of aircraft conducting operations in the airspace; and the database of State PBN and data link approvals.

2.5.3 Ideally, this compliance monitoring should be done for the entire airspace on a daily basis. Difficulties in accessing traffic movement information may make such daily monitoring impossible. As a minimum, an EMA should conduct compliance monitoring of the complete airspace for at least a 30-day period annually.

2.5.4 When conducting compliance monitoring, the filed PBN or data link approval status shown on the flight plan of each aircraft movement should be compared to the database of State PBN and data link approvals. When a flight plan shows a PBN or data link approval not confirmed in the database, the appropriate State authority should be contacted for clarification of the discrepancy. An EMA should use a letter similar in form to that shown in Appendix G for the official notification.

2.5.5 An EMA should keep in mind that the State authority has the responsibility to take any action should an operator be found to have filed an incorrect declaration of State PBN or data link approval.

## 2.6 Remedial Actions

2.6.1 Remedial actions are those measures taken to remove causes of systemic problems associated with factors affecting safe use of the PBN-based separation. Remedial actions may be necessary to remove the causes of problems such as the following:

a) failure of an aircraft to comply with PBN or data link requirements

b) aircraft operating practices resulting in large horizontal-plane deviations

c) operational errors.

2.6.2 Monitoring results should be periodically reviewed by the EMA and the associated Regional Scrutiny Group in order to determine if there is evidence of any recurring problems or adverse trends.

2.6.3 As a minimum, an EMA and the associated Regional Scrutiny Group should conduct an annual review of reports of large horizontal-plane deviations with a view toward uncovering systemic problems and initiating remedial action. Should such a problem be discovered, an EMA should report its findings to the body overseeing horizontal-plane separation implementation, or to the RASMAG. An EMA should include in its report the details of large horizontal-plane deviations suggesting the root cause of the problem.

## 2.7 Review of Operational Concept

2.7.1 Experience has shown that the operational concept for the application of the horizontal-plane separation adopted by bodies overseeing horizontal-plane separation implementations can affect substantially the collision risk in airspace.

2.7.2 An EMA should review carefully the operational concept agreed by the body overseeing horizontal-plane separation implementation with a view to identifying any features of airspace use which may influence risk. An EMA should inform the oversight body of any aspects of the operational concept which it considers important in this respect.

# LIST OF APPENDICES

**APPENDIX A -**

Flight Information Regions and Responsible En-route Monitoring Agency

| FIR | Responsible EMA |
|---|---|
| Anchorage Oceanic | PARMO |
| Auckland Oceanic | |
| Bangkok | |
| Brisbane | AAMA |
| Calcutta | |
| Chennai | |
| Colombo | |
| Delhi | |
| Dhaka | |
| Fukuoka | |
| Hanoi | |
| Ho Chi Minh | SEASMA |
| Hong Kong | SEASMA |
| Honiara | |
| Inchon | |
| Jakarta | |
| Kabul | |
| Karachi | |
| Kathmandu | |
| Kota Kinabalu | SEASMA |
| Kuala Lumpur | SEASMA |
| Lahore | |
| Male | |
| Manila | SEASMA |
| Melbourne | AAMA |
| Mumbai | |
| Nadi | |
| Nauru | |
| Oakland Oceanic | PARMO |
| Phnom Penh | |
| Port Moresby | |
| Sanya | SEASMA |
| Singapore | SEASMA |
| Tahiti | |
| Taibei | |
| Ujung Pandang | |
| Ulaan Baatar | |
| Vientiane | |
| Yangon | |

**APPENDIX B -**

## States and Designated EMA for the reporting of PBN and Data Link Approvals

**The following table provides a listing of States and the respective designated EMA for the reporting of PBN and data link approvals. Each designated EMA should advise the relevant States of its requirements with respect to reporting of PBN and data link approvals.**

| ICAO Contracting State | Designated EMA for PBN and Data Link Approvals |
|---|---|
| Afghanistan | |
| Australia | AAMA |
| Bangladesh | |
| Bhutan | |
| Brunei Darussalam | |
| Cambodia | |
| China | SEASMA |
| Cook Islands | |
| Democratic People's Republic of Korea | |
| Fiji | |
| India | |
| Indonesia | |
| Japan | |
| Kiribati | |
| Lao People's Democratic Republic | |
| Malaysia | SEASMA |
| Maldives | |
| Marshall Islands | |
| Micronesia (Federated States of) | |
| Mongolia | |
| Myanmar | |
| Nauru | |
| Nepal | |
| New Zealand | |
| Pakistan | |
| Palau | |
| Papua New Guinea | |
| Philippines | SEASMA |
| Republic of Korea | |
| Samoa | |
| Singapore | SEASMA |
| Solomon Islands | |
| Sri Lanka | |
| Thailand | |
| Tonga | |
| United States | PARMO |
| Vanuatu | |
| Viet Nam | SEASMA |

**APPENDIX C -**

## EMA Forms For Use in Obtaining Records of PBN and Data Link Approvals From a State Authority

There are 4 EMA forms for the collection of essential information relating to PBN and data link approvals:

EMA A1 – Point of Contact Details for Matters Relating to PBN or Data Link Approvals
EMA A2 – Record of PBN or Data Link Approval
EMA A3 – Withdrawal of PBN or Data Link Approval

1. Please read these notes before attempting to complete forms EMA A1, A2, A3 and A4.

2. It is important for the EMAs to have an accurate record of a point of contact for any queries that might arise from the monitoring of horizontal-plane separation. Recipients are therefore requested to include a completed EMA A1 with their first reply to the EMA. Thereafter, there is no further requirement unless there has been a change to the information requested on the form.

3. Form EMA A2 must be completed for each operator/aircraft granted a PBN or data link approval.

4. Form EMA A3 must be completed and submitted immediately whenever a State of Registry has cause to withdraw an operator/aircraft PBN or data link approval.

5. Note: the fields in the forms should be completed as indicated below. The numbers refer to the superscript numbers on forms EMA A2 and EMA A3.

   (1) Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the case of there being more than one identifier designated for the State, use the letter identifier that appears first.
   (2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". For military aircraft, enter "MIL". If none, place an X in this field and enter the name of the operator/owner in the Remarks row.
   (3) Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.
   (4) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
   (5) Enter ICAO allocated Aircraft Mode S address code in hexadecimal format.
   (6) Enter the type of PBN Approval, e.g. RNP 2, RNP 4, RNAV 10, Data Link in each boxes provided.
   (7) Enter date in dd/mm/yy format, e.g. for 26 October 2007 enter 26/10/07.
   (8) Use a separate sheet of paper if insufficient space available.
   (9) Enter or Select Operator Type. E.g. Civil or Military.

# EMA A1

## POINT OF CONTACT DETAILS
## FOR MATTERS RELATING TO PBN OR DATA LINK APPROVALS

*This form should be completed and returned to the address below on the first reply to the EMA or when there is a change to any of the details requested on the form.* ***PLEASE USE BLOCK CAPITALS THROUGHOUT.***

| | | | |
|---|---|---|---|
| NAME OF STATE AUTHORITY OR ORGANISATION | | | |
| STATE OF REGISTRY | | | |
| STATE OF REGISTRY (ICAO 2 letter identifier) | | | |

If there is more than one identifier for the State, please use the first that appears in the list.

| **ADDRESS DETAILS** | |
|---|---|
| STREET | |
| CITY | |
| STATE/PROVINCE | |
| ZIP/POSTAL CODE | |
| COUNTRY/REGION | |

| **CONTACT PERSON** | |
|---|---|
| TITLE | |
| FIRST NAME | |
| MIDDLE NAME | |
| LAST NAME | |
| JOB TITLE | |
| EMAIL | |

| **PHONE DETAILS** | | | |
|---|---|---|---|
| COUNTRY CODE | | AREA CODE | |
| DIRECT LINE | | FAX NUMBER | |

Please Tick One: ☐ Initial Reply ☐ Change of details

When complete, please return to:

EMA Address

Telephone:
Fax:
E-Mail

# EMA A2
# RECORD OF PBN APPROVAL

When a State of Registry approves or amends the approval of an operator/aircraft for PBN, details of that approval must be recorded and sent to the appropriate EMA without delay.

*Please refer to the accompanying notes before providing the information requested below.*
**PLEASE USE BLOCK CAPITALS**.

| | |
|---|---|
| State of Registry[1]: | |
| State of Operator[1:] | |
| Operator Identifier[2]: | |
| Name of Operator: | |
| Operator Type[9]: | * CIVIL / * MILITARY (* DELETE AS APPROPRIATE) |
| Registration Date[7]: | |
| Aircraft Type[3]: | |
| Aircraft Series[4]: | |
| Manufacturers Serial Number: | |
| Registration Mark: | |
| Mode S Address Code (Hex)[5]: | |
| Number of Navigation System: | |
| Make/Model of Long Range Navigation System: | |

| | | | | |
|---|---|---|---|---|
| PBN Approval Type[6]: | | | | |
| PBN Time Limit: | | | | |
| Date of Approval[7]: | | | | |
| Date of Expiry[7]: | | | | |
| Approval Authority (CAA): | | | | |
| Approving CAA Official: | | | | |
| Region for PBN Approval: | | | | |
| State of PBN Approval[1]: | | | | |

Status of Previous PBN Approval: ☐ Please tick if any, describe approval

| |
|---|
| Remarks[8]: |
| |
| |
| |
| |

When complete, please return to the following address.

EMA Address

Telephone:
Fax:
Email:

(1) Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the case of there being more than one identifier designated for the State, use the letter identifier that appears first.

(2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". For military aircraft, enter "MIL". If none, place an X in this field and enter the name of the operator/owner in the Remarks row.

(3) Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.

(4) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.

(5) Enter ICAO allocated Aircraft Mode S address code in hexadecimal format.

(6) Enter the type of PBN Approval, e.g. RNP 2, RNP 4, RNAV 10, Data Link in each boxes provided.

(7) Enter date in dd/mm/yy format, e.g. for 26 October 2007 enter 26/10/07.

(8) Use a separate sheet of paper if insufficient space available.

(9) Enter or Select Operator Type. E.g. Civil or Military.

## EMA A3
## WITHDRAWAL OF PBN OR DATALINK APPROVAL

When a State of Registry has cause to withdraw the PBN or data link approval of an operator/aircraft, the details requested below must be sent to the EMA without delay.

*Please refer to the accompanying notes before providing the information requested.* **PLEASE USE BLOCK CAPITALS**.

| | |
|---|---|
| State of Registry[1] | |
| Operator Identifier[2] | |
| State of Operator[1] | |
| Aircraft Type[3] | |
| Aircraft Series[4] | |
| Manufacturers Serial Number | |
| Registration Mark | |
| Mode S Address Code (Hex)[5] | |

| | |
|---|---|
| Approval Withdrawn (PBN or DL)[6] | |
| Date of Withdrawal[7] | |
| PBN Withdrawn CAA Official | |

| | |
|---|---|
| Reason for Withdrawal | |

When complete, please return to the following address.

EMA Address

Telephone:
Fax:
Email:

(1) Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the case of there being more than one identifier designated for the State, use the letter identifier that appears first.

(2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". For military aircraft, enter "MIL". If none, place an X in this field and enter the name of the operator/owner in the Remarks row.

(3) Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.

(4) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.

(5) Enter ICAO allocated Aircraft Mode S address code in hexadecimal format.

(6) Enter the type of PBN Approval, e.g. RNP 2, RNP 4, RNAV 10, Data Link in each boxes provided.

(7) Enter date in dd/mm/yy format, e.g. for 26 October 2007 enter 26/10/07.

(8) Use a separate sheet of paper if insufficient space available.

(9) Enter or Select Operator Type. E.g. Civil or Military.

**APPENDIX D -**

## Minimal Informational Content For Each State PBN Or Data Link Approval To Be Maintained In Electronic Form By An EMA

*Aircraft PBN and Data Link Approvals Data*

To properly maintain and track PBN and data link approval information some basic aircraft identification information is required (e.g., manufacturer, type, serial number, etc.) as well as details specific to an aircraft's PBN and data link approval status. Table 1 lists the minimum data fields to be collected by an EMA for an individual aircraft. Table 1a describes the approvals database record format.

*Table 1. Aircraft PBN and Data Link Approvals Data*

| Field | Description |
|---|---|
| Registration mark | Aircraft's current registration mark |
| Mode S Address Code (Hex) | Aircraft's current Mode S code 6 hexadecimal digits |
| Manufacturer Serial number | Aircraft Serial Number as given by manufacturer |
| Aircraft type | Aircraft Type as defined by ICAO document 8643 |
| Aircraft Series | Aircraft generic series as described by the aircraft manufacturer (e.g., 747-100, series = 100) |
| State of Registry | State to which the aircraft is currently registered as defined in ICAO document 7910 |
| Registration date | Date registration was active for current operator |
| Operator Identifier | ICAO code for the current Operator as defined in ICAO document 8585 |
| Operator name | Name of the current Operator |
| State of Operator | State of the current Operator as defined in ICAO document 7910 |
| Operator Type | Aircraft is civil or military |
| PBN approval type | PBN approval – eg RNP 4, RNAV 2, RNP 1 |
| Region for PBN approval | Name of region where the PBN approval is applicable Note: Only required if PBN Approval is issued for a specific region |
| State of PBN approval | State granting PBN approval as defined in ICAO document 9613 |
| Date PBN approved | Date of PBN Approval |
| Date of PBN expiry | Date of Expiry for PBN Approval |
| Date of Data Link approval | Date of Data Link Approval |
| Remarks | Open comments |
| Date of withdrawal of PBN approval | Date of withdrawal of the aircraft's PBN approval (if applicable) |
| Info by Authority | Yes or no indication "Was the information provided to the EMA by a State Authority?" |

* not necessarily a separate field. Can be a field on its own, or it is indicated in the operator ICAO code as MIL when the military has an ICAO code designator.

*Table 1a. Approvals Database Record Format*

| Field | Description | Type | Width | Valid Range |
|---|---|---|---|---|
| State of Registry | State of Registry | Alphabetic | 2 | AA-ZZ |
| Operator | Operator | Alphabetic | 3 | AAA-ZZZ |
| State of Operator | State of Operator | Alphabetic | 2 | AA-ZZ |
| AC Type | Aircraft Type | Alphanumeric | 4 | e.g. MD11 |
| AC Mark/Series | Aircraft Mark / Series | Alphanumeric | 6 | |
| Serial Number | Manufacturer's Serial/Construction Number | Alphanumeric | 12 | |
| AC registration mark | Aircraft registration mark | Alphanumeric | 10 | |
| Mode S | Aircraft Mode "S" address (Hexadecimal) | Alphanumeric | 6 | 000001-FFFFFF |
| PBN approval type | PBN approval type | Alphanumeric | 6 | e.g RNP4 |
| Approval date | Date PBN approval issued (dd/mm/yyyy) | Date | 10 | e.g. 31/12/1999 |
| Date of expiry | Date of expiry of PBN approval (if any) (dd/mm/yyyy) | Date | 10 | e.g. 31/12/1999 |
| DL approval date | Date Data Link approval issued (dd/mm/yyyy) | Date | 10 | e.g. 31/12/1999 |
| Remarks | National remarks | Alphanumeric | 60 | ASCII text |

*Aircraft Re-Registration/Operating Status Change Data*

Aircraft frequently change registration information. Re-registration and change of operating status information is required to properly maintain an accurate list of the current population. Table 2 lists the minimum data fields to be maintained by an EMA to manage aircraft re-registration/operating status change data.

*Table 2. Aircraft Re-Registration/Operating Status Change Data*

| Field | Description |
|---|---|
| Reason for change | Reason for change. Aircraft was re-registered, destroyed, parked, etc. |
| Previous registration mark | Aircraft's previous registration mark. |
| Previous Mode S | Aircraft's previous Mode S code. |
| Previous operator name | Previous name of operator of the aircraft. |
| Previous operator ICAO Code | ICAO code for previous aircraft operator. |
| Previous State of Operator | ICAO code for the previous State of the operator |
| New State of Operator | ICAO code for the State of the current aircraft operator. |
| New registration mark | Aircraft's current registration mark. |
| New State of Registration | Aircraft's current State of Registry. |
| New operator name | Current name of operator of the aircraft. |
| New Operator ICAO Code | ICAO code for the current aircraft operator. |
| Aircraft ICAO Type designator | Aircraft Type as defined by ICAO document 8643 |
| Aircraft series | Aircraft generic series as described by the aircraft manufacturer (e.g., 747-100, series = 100). |
| Serial number | Aircraft Serial Number as given by manufacturer |
| New Mode S | Aircraft's current Mode S code 6 hexadecimal digits. |
| Date change is effective | Date new registration/ change of status became effective. |

*Contact Data*

An accurate and up to date list of contacts is essential for an EMA to do business. Table 3 lists the minimum content for organizational contacts and Table 4 lists the minimum content for individual points-of-contact.

*Table 3. Organizational Contact Data*

| Field | Description |
|---|---|
| Type | Type of contact (e.g., Operator, Airworthiness Authority, Manufacturer) |
| State | State in which the company is located. |
| State ICAO | ICAO code for the State in which the company is located. |
| Company/Authority | Name of the company/authority as used by ICAO (e.g., Bombardier) |
| Fax No | Fax number for the company. |
| Telephone number | Telephone number for the company. |
| Address (1-4) | Address lines 1-4 filled as appropriate for the company. |
| Place | Place (city, etc.) in which the company is located. |
| Postal code | Postal code for the company. |
| Country | Country in which the company is located. |
| Remarks | Open comments |
| Modification date | Last Modification Date. |
| Web-site | Company Web HTTP Location. |
| e-mail | Company e-mail address. |
| Civ/mil | Civil or Military. |

*Table 4. Individual Point of Contact Data*

| Field | Description |
|---|---|
| Title contact | Mr., Mrs., Ms., etc. |
| Surname contact | Surname or family name of point of contact. |
| Name contact | Given name of point of contact. |
| Position contact | Work title of the point of contact. |
| Company/Authority | Name of the company/authority as used by ICAO (e.g., Bombardier) |
| Department | Department for the point of contact. |
| Address (1-4) | Address lines 1-4 filled as appropriate for the point of contact. |
| Place | Place (city, etc.) in which the point of contact is located. |
| Postal code | Postal code for the location of the point of contact. |
| State | State in which the point of contact is located. |
| Country | Country in which the point of contact is located. |
| E-mail | E-mail of the point of contact. |
| Telex | Telex number of the point of contact. |
| Fax No | Fax number of the point of contact. |
| Telephone no 1 | First telephone number for the point of contact. |
| Telephone no 2 | Second telephone number for the point of contact. |

*Data Exchange Between EMAs*

The following sections describe how data is to be shared between EMAs as well as the minimum data set that should be passed from one EMA to another. This minimum sharing data set is a sub-set of the data defined in previous sections of Appendix D.

All EMAs receiving data have responsibility to help ensure data integrity. A receiving EMA must report back to the sending EMA any discrepancies or incorrect information found in the sent data.

*Data Exchange Procedures*

The standard mode of exchange shall be e-mail or FTP. Data shall be presented in Microsoft Excel or Microsoft Access.

EMAs must be aware that the data are current only to the date of the created file.

*Table 5. EMA Data Exchange Procedures*

| Data Type | Data Subset | Frequency | When |
|---|---|---|---|
| PBN and Data Link Approvals | All | Monthly | First week in month |
| Aircraft Re-registration/status | New since last broadcast | Monthly | First week in month |
| Contact | All | Monthly | First week in month |
| Non-Compliant Aircraft | All | As Required. | Immediate |

In addition to regular data exchanges, one-off queries shall be given to an EMA on request. This includes requests for data in addition to the minimum exchanged data set such as service bulletin information.

*Exchange of Aircraft Approvals Data*

An EMA shall exchange PBN and Data Link Approvals data with other EMAs.. The following table defines the fields required for sending a record to another EMA.

*Table 6. Exchange of Aircraft Approvals Data*

| Field | Needed to Share |
|---|---|
| Registration mark | **Desirable** |
| Mode S | Desirable |
| Serial number | **Desirable** |
| Aircraft type | **Mandatory** |
| Aircraft Series | **Mandatory** |
| State of Registry | **Mandatory** |
| Registration date | Desirable |
| Operator Identifier | **Mandatory** |
| Operator name | Desirable |
| State of Operator | **Mandatory** |
| Civil or military indication (not a field on its own. It is indicated in the ICAO operator code as MIL except when the military has a code) | Desirable |
| PBN approval type | **Mandatory** |
| State of PBN Approval | **Mandatory** |
| Date PBN approved | **Mandatory** |
| Date of PBN approval expiry | **Mandatory** |
| Date Data Link approved | **Mandatory** |
| Remarks | No |
| Date of withdrawal of PBN approval | **Mandatory** |
| Info by Authority | **Mandatory** |

### *Aircraft Re-Registration/Operating Status Change Data*

An EMA shall share all re-registration information.

*Table 7. Exchange of Aircraft Re-Registration/Operating Status Change Data*

| Field | Need to Share |
|---|---|
| Reason for change (ie. re-registered, destroyed, parked) | **Mandatory** |
| Previous registration mark | **Mandatory** |
| Previous Mode S | Desirable |
| Previous operator name | Desirable |
| Previous operator ICAO Code | **Mandatory** |
| Previous State of Operator | **Mandatory** |
| State of Operator | **Mandatory** |
| New registration mark | **Mandatory** |
| New State of Registration | **Mandatory** |
| New operator nName | Desirable |
| New operator code | Desirable |
| Aircraft ICAO Type designator | **Mandatory** |
| Aircraft series | **Mandatory** |
| Serial number | **Mandatory** |
| New Mode S | **Mandatory** |
| Date change is effective | Desirable |

### *Exchange of Contact Data*

*Table 8. Exchange of Organizational Contact Data Fields*

| Field | Need to Share |
|---|---|
| Type | **Mandatory** |
| State | **Mandatory** |
| State ICAO | Desirable |
| Company/Authority | **Mandatory** |
| Fax No | Desirable |
| Telephone number | **Mandatory** |
| Address (1-4) | **Mandatory** |
| Place | **Mandatory** |
| Postal code | **Mandatory** |
| Country | **Mandatory** |
| e-mail | Desirable |
| civ/mil | Desirable |

*Table 9. Exchange of Individual Point of Contact Data Fields*

| Field | Need to Share |
|---|---|
| Title contact | Desirable |
| Surname contact | **Mandatory** |
| Name contact | Desirable |
| Position contact | Desirable |
| Company/Authority | **Mandatory** |
| Department | Desirable |
| Address (1-4) | **Mandatory** |
| Place | **Mandatory** |
| Postal code | **Mandatory** |
| Country | **Mandatory** |
| State | **Mandatory** |
| E-mail | Desirable |
| Fax No | Desirable |
| Telephone no 1 | **Mandatory** |
| Telephone no 2 | Desirable |

*Confirmed Non-Compliant Information*
As part of its monitoring assessments an EMA may identify a non-compliant aircraft. This information should be made available to other EMAs.

When identifying a non-compliant aircraft an EMA should include

- Notifying EMA
- Date sent
- Field
- Registration mark
- Mode S
- Serial number
- ICAO Type Designator
- State of Registry
- Registration date
- Operator ICAO Code
- Operator name
- State of Operator
- Date(s) of non-compliance(s)
- Action started (y/n)
- Date non-compliance resolved

*Fixed parameters -Reference Data Sources*
The sources of some standard data formats used by an EMA are listed below.

- ICAO Doc. 7910 " Location Indicators"
- ICAO Document 8585 " Designators for Aircraft Operating Agencies, Aeronautical Authorities, and Services"
- ICAO Document 8643 " Aircraft Type Designators"
- IATA "Airline Coding Directory"

**APPENDIX E-**

## Suggested Form for ATC Unit Monthly Report of Large Lateral Deviations or Large Longitudinal Errors

## [EN-ROUTE MONITORING AGENCY NAME]

*Report of Large Lateral Deviation or Large Longitudinal Error*

Report to the (*En-route Monitoring Agency Name*) of a large lateral deviation (LLD) or a large longitudinal error (LLE), including those due to weather deviations and other contingency events, as defined below:

| Type of Error | Category of Error | Criterion for Reporting |
|---|---|---|
| Lateral deviation | Individual-aircraft error | 15NM or greater magnitude |
| Longitudinal deviation | Aircraft-pair (Time-based separation applied) | Infringement of longitudinal separation standard based on routine position reports |
| Longitudinal deviation | Aircraft-pair (Time-based separation applied) | Expected time between two aircraft varies by 3 minutes or more based on routine position reports |
| Longitudinal deviation | Individual-aircraft (Time-based separation applied) | Pilot estimate varies by 3 minutes or more from that advised in a routine position report |
| Longitudinal deviation | Aircraft-pair (Distance-based separation applied) | Infringement of longitudinal separation standard, based on ADS, radar measurement or special request for RNAV position report |
| Longitudinal deviation | Aircraft-pair (Distance-based separation applied) | Expected distance between an aircraft pair varies by 10NM or more, even if separation standard is not infringed, based on ADS, radar measurement or special request for RNAV position report |

Name of ATC unit:_____

Please complete Section I or II as appropriate

**SECTION I:**

There were no reports of LLDs or LLEs for the month of _____

**SECTION II:**

There was/were _____ report(s) of LLD

There was/were _____ report(s) of LLE

Details of the LLDs and LLEs are attached.

(Please use a separate form for each report of lateral deviation or longitudinal error).

**SECTION III:**

When complete please forward the report(s) to:

En-route Monitoring Agency Name
Postal address
Telephone:
Fax:
E-Mail:

# NAVIGATION ERROR INVESTIGATION FORM

| **PART 1 - To be completed by responsible officer in the Service Provider (and aircraft owner/operator if need)** | | |
|---|---|---|
| ATC Unit Observing Error: | | |
| Date/Time (UTC): | | |
| Duration of Deviation: | | |
| Type of Error: (tick one) ☐ LATERAL ☐ LONGITUDINAL | | |
| **Details of Aircraft** | | |
| | **First Aircraft** | **Second Aircraft (when longitudinal deviation observed)** |
| Aircraft Identification: | | |
| Name of owner/Operator: | | |
| Aircraft Type: | | |
| Departure Point: | | |
| Destination: | | |
| Route Segment: | | |
| Cleared Track: | | |
| Position where error was observed: (BRG/DIST from fixed point or LAT/LONG) | | |
| Extent of deviation – magnitude and direction: (NM for lateral, min/NM for longitudinal) | | |
| Flight Level: | | |
| **For All Errors** | | |
| Action taken by ATC: | | |
| Crew Comments when notified of Deviation: | | |
| Other Comments: | | |

**** (Please Attach ATS Flight Plan)**

# NAVIGATION ERROR INVESTIGATION FORM

| **PART 2 - Details of Aircraft, and Navigation and Communications Equipment Fit (To be completed by aircraft owner/operator)** | | | |
|---|---|---|---|
| **LRNS** | **Number of Systems (0, 1, 2 etc.)** | **Make** | **Model** |
| INS | | | |
| IRS | | | |
| GNSS | | | |
| FMS | | | |
| Others (please Specify) | | | |
| **COMS** | | | |
| HF | | | |
| VHF | | | |
| SATCOM | | | |
| CPDLC | | | |
| Which navigation system was coupled to the autopilot at the time of observation of the error? | | | |
| Which NAV MODE was selected at the time of observation of the error? | | | |
| Which comms system was in use at the time of observation of the error? | | | |
| Aircraft registration and model/series | | | |
| Was the aircraft operating according to PBN requirements? | | ☐ Yes | ☐ No |

# NAVIGATION ERROR INVESTIGATION FORM

| **PART 3 – Detailed description of incident (To be completed by owner/operator – use separate sheet if required)** |
|---|
| Please give your assessment of the actual track flown by the aircraft, and the cause of the deviation: |
| Corrective action proposed: |

| **PART 4 – To be completed by owner/operator, only in the event of partial or total navigation equipment failure.** | | | |
|---|---|---|---|
| **Navigation System Type** | **INS** | **IRS/FMS** | **Others (Please specify)** |
| Indicate the number of units of each type which failed | | | |
| Indicate position at which failure(s) occurred | | | |
| Give an estimate of the duration of the equipment failure(s) | | | |
| At what time were ATC advised of the failure(s)? | | | |

# NAVIGATION ERROR INVESTIGATION FORM

| **PART 5 – To be completed by investigating agency** | | |
|---|---|---|
| Have all required data been supplied? | ☐ Yes | ☐ No |
| Is further investigation warranted? | ☐ Yes | ☐ No |
| Will this incident be the subject of a separate report? | ☐ Yes | ☐ No |
| General comments: | | |
| Classification: (please circle) A B C D E F G H I | | |

| **CLASSIFICATION OF GROSS NAVIGATION ERRORS** | |
|---|---|
| **Deviation Code** | **Cause of Deviation** |
| Operational Errors | |
| A | ~~Aircraft not approved to PBN requirements~~ Flight crew deviate without ATC Clearance; |
| B | Flight crew incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearance etc.); |
| C | Flight crew waypoint insertion error, due to correct entry of incorrect position or incorrect entry of correct position; |
| D | ATC system loop error (e.g. ATC issues incorrect clearance, Flight crew misunderstands clearance message etc); |
| E | Coordination errors in the ATC-unit-to-ATC-unit transfer of control responsibility; |
| Deviation due to navigational errors | |
| ~~D~~ | ~~Navigation errors, including equipment failure notified to ATC in time for action~~ |
| ~~E~~ | ~~Other navigation errors, including equipment failure notified to ATC too late for action~~ |
| F | Navigation errors, including equipment failure of which notification was not received by ATC or notified too late for action; |
| ~~G~~ | ~~Mode select error~~ |
| Deviation due to Meteorological Condition | |
| G | Turbulence or other weather related causes (other than approved); |
| Others | |
| H | An aircraft without PBN approval; |
| I | Others (Please specify) |

**APPENDIX F –**

## *Note: Align this template with the standardized Asia/Pacific RMA data collection template, include PBN Approval type in RMA template, include ATS route in EMA template*

**Sample Content and Format for Collection of Sample of Traffic Movements**

The following table lists the information required for each flight in a sample of traffic movements.

### *INFORMATION FOR EACH FLIGHT IN THE SAMPLE*

The information requested for a flight in the sample is listed in the following table with an indication as to whether the information is necessary or is optional:

| FIELD | EXAMPLE | MANDATORY OR OPTIONAL |
|---|---|---|
| Date (dd/mm/yyyy) | 08/05/2007 for 8 May 2007 | MANDATORY |
| Aircraft call sign | XXX704 | MANDATORY |
| Aircraft Type | B734 | MANDATORY |
| Aircraft registration mark | VH-ABC | MANDATORY |
| Origin Aerodrome | WMKK | MANDATORY |
| Destination Aerodrome | RPLL | MANDATORY |
| PBN Approval type | RNP 4 | OPTIONAL |
| Entry Fix into Airspace | MESOK | MANDATORY |
| Time at Entry Fix (UTC) | 0225 or 02:25 | MANDATORY |
| Flight Level at Entry Fix | 330 | MANDATORY |
| Assigned Mach number at Entry Fix | M0.77 | OPTIONAL |
| Route after Entry Fix | | OPTIONAL |
| Exit Fix from Airspace | NISOR | MANDATORY |
| Time at Exit Fix (UTC) | 0401 or 04:01 | MANDATORY |
| Flight Level at Exit Fix | 330 | MANDATORY |
| Assigned Mach number at Exit Fix | M0.77 | OPTIONAL |
| Route after Exit Fix | | OPTIONAL |
| First Fix Within the Airspace OR First Airway Within the Airspace | MESOK OR G582 | OPTIONAL |
| Time at First Fix (UTC) | 0225 or 02:25 | OPTIONAL |
| Flight Level at First Fix | 330 | OPTIONAL |
| Second Fix Within the Airspace OR Second Airway Within the Airspace | MEVAS OR G577 | |
| Time at Second Fix (UTC) | 0250 or 02:50 | OPTIONAL |
| Flight Level at Second Fix | 330 | OPTIONAL |
| (Continue with as many Fix/Time/Flight-Level entries as are required to describe the flight's movement within the airspace) | | OPTIONAL |

**APPENDIX G -**

## Letter To State Authority Requesting Clarification Of The State PBN or Data Link Approval Status Of An Operator

*When the PBN or data link approval status shown in filed flight plan is not confirmed in an EMA's database of State approvals, a letter similar to the following should be sent to the relevant State authority.*

**<STATE AUTHORITY ADDRESS>**

1. The (*EMA name*) has been established by the ICAO Asia/Pacific Regional Airspace Safety Monitoring Advisory Group (RASMAG) to support safe implementation and use of the horizontal-plane separation in (*airspace where the EMA has responsibility*), in accordance with guidance published by the International Civil Aviation Organization.

2. Among the other activities, the (*EMA name*) conducts a comparison of the State PBN and data link approval status, provided by an operator to an air traffic control unit, to the record of State PBN and data link approval available to us. This comparison is considered vital to ensuring the continued safe use of horizontal-plane separation.

3. This letter is to advise you that an operator which we believe is on your State registry provided notice of State PBN or data link approval which is not confirmed by our records. The details of the occurrence are as follows:

Date:
Operator name:
Aircraft flight identification:
Aircraft type:
Registration mark:
Filed PBN Approval type:
Filed Data Link Approval Status:
ATC unit receiving notification:

4 We request that you advise this office of the PBN and data link approval status of this operator. In the event that you have not granted a PBN or data link approval to this operator, we request that you advise this office of any action which you propose to take.

Sincerely,

(*EMA official*)

**APPENDIX H -**

# Description of Models Used to Estimate Risk

***(to be developed)***

# AGENDA ITEM 8: REVIEW DEVELOPMENTS RELATING TO CNS/ATM IMPLEMENTATION

**Agenda Item 8: Review developments relating to CNS/ATM implementation**

**Review of Interim Edition of Regional PBN Implementation Plan**

8.1 The nineteenth meeting of APANPIRG (APANPIRG/19, September 2008) adopted an interim edition of the Asia/Pacific Regional PBN Implementation Plan, for circulation to States and to assist States in preparation of their national PBN implementation plans. As the Regional PBN Implementation Plan had not yet been reviewed by the Regional Airspace Safety Monitoring Advisory Group (RASMAG) or the ATM/AIS/SAR/SG, APANPIRG/19 adopted an 'interim' edition only, pending review by these two sub-groups.

8.2 The tenth meeting of RASMAG (RASMAG/10, December 2008) conducted a review of the Regional PBN Implementation Plan. The RASMAG proposals were reviewed by the PBN Task Force (PBN/TF) at its fourth meeting (PBN/TF/4, March 2009). PBN/TF/4 amended the APAC Regional PBN Implementation Plan (Interim Edition Version '0.1'). The revised version of the document as finalized by PBN/TF/4 (Interim Edition Version '0.2'), attached as **Appendix A** to the Report on Agenda Item 8, was presented for consideration by the meeting.

8.3 The Sub-Group reviewed the revised version (Version '0.2') of the interim edition of the Regional PBN Implementation Plan. The meeting noted that some appendices of the regional plan were still to be developed and assumed that this would take place before the final version was presented to APANPIRG in September. The meeting did not immediately identify further amendments as necessary to the regional plan, however delegates would provide the Version 0.2 to State experts after the meeting for further review. Any proposed amendments would be submitted by States directly to the PBN/TF/5 meeting on 15-17 July 2009.

**Establishment of Radar Service in Upper Sectors Ujung Pandang**

8.4 Information presented by Indonesia described the actions taken to enhance safety by improving surveillance capability in the Upper Sectors of Ujung Pandang FIR. The objective of implementing radar surveillance capabilities in Upper sectors of Ujung Pandang is to enhance safety and airspace capacity by the improveement of surveillance capability over the area and to harmonize ATS for the flight operations in Ujung Pandang FIR.

8.5 Indonesia has taken some actions to prepare the implementation of radar service on that area, as follows:

- Delivered 36 ATCOs to Air Services Australia (ASA) to join Area Radar Training in 2006 and 2007.
- ATC infacility training was held in June – July 2008.
- Operational testing is still running.
- Final inspection and publishing the AIP Supplement regarding establishment of radar service within Upper Sectors Ujung Pandang, expected in July 2009.

8.6 The meeting commended the actions taken by Indonesia. The implementation of radar surveillance would allow the current 15 minute and 10 minute longitudinal separation standards to be replaced with a 10 NM radar standard. This would have a dramatic effect by increasing airspace capacity enormously, as well as lowering workload for ATCOs. When considered in conjunction with the extensive ADS-B project that is well underway in Indonesia and the ongoing data link trials from Makassar ACC, it is evident that Indonesia is making a genuine commitment to improving civil aviation sieves in Indonesia. .

**Operational Trial of ADS-B In-Trail Procedures**

8.7 The United States provided an in-depth update on planning by the FAA to conduct an operational trial of ADS-B In-Trail Procedures (ITP) in the South Pacific. For ADS-B ITP, the maneuvering aircraft obtains the flight identification on proximate ADS-B equipped non-maneuvering aircraft using ADS-B IN technologies. Based on the ADS-B data from the non-maneuvering or reference aircraft, a pilot can make an ITP altitude change request to ATC. The controller, who maintains separation responsibility at all times can then approve the manoeuvre. The planned trial will be undertaken with United Airlines B747 aircraft and will be closely monitored and supervised by the FAA.

8.8 One of the more significant ADS-B ITP developmental activities has been the work that was undertaken by the ICAO Separation and Airspace Safety Panel (SASP) beginning at the tenth meeting of the SASP Working Group of the Whole (WG/WHL/10) held in Australia in November 2006. The SASP agreed that there was a need to develop procedures and material for inclusion in Doc 4444 PANS-ATM in addition to work being undertaken concurrently to establish the separation minima by collision risk modeling. To this end, the longitudinal subgroup of SASP has developed a PANS-ATM amendment with the intent that these provisions will set the requirements for the implementation of ADS-B ITP by Regions or States.

8.9 During 2008 both RTCA and EUROCAE approved and published safety, performance and interoperability requirements documents for ITP. The documents are the DO-3122 and ED-1593, respectively and contain an Operational and Service Environment Description (OSED), an Operational Safety Assessment (OSA), an Operational Performance Assessment (OPA) and a collision risk model for ADS-B ITP. It is important to note that the RFG's terminology for ADS-B ITP is Air Traffic Situational Awareness – In-Trial Procedures (ATSA-ITP). The DO-312 or ED-159 provide more details of the procedure and the standards developed by RTCA and EUROCAE.

8.10 The Sub-Group supported the ADS-B ITP operational trials in the South Pacific, noting the significant economic and efficiency benefits for both service providers and airspace users.

**Development of ADS-C In-Trail Procedures**

8.11 The United States also updated the meeting about FAA planning for an operational trial of Automatic Dependent Surveillance–Contract (ADS-C) In-Trail Procedures (ITP) in the Pacific. An overview was provided of initiatives to assess the use of ADS-C to allow for a reduction below RNP 4 based 30 NM longitudinal separation for properly equipped aircraft (RNP-4, CPDLC, ADS-C, GNSS) that will climbed/descend through blocking traffic. The current target longitudinal standard being assessed is 16 nautical miles and distance measurement will be carried out by requesting near simultaneous periodic ADS-C reports.

8.12 This procedure is based on in-trail Distance Measuring Equipment (DME) rules in ICAO Doc 4444, paragraph 5.4.2.3.2. Aircraft pair distance verification is performed by ground flight tracking systems, such as the FAA's Ocean21 system, using near simultaneous ADS-C demand contract reports. As with the existing DME procedure, responsibility for separation assurance remains with air traffic control. Controller procedures have already been developed; however, at this time they are somewhat cumbersome in that they require several manual inputs by the controllers. If the demonstrations prove successful, it is the intent of the FAA to automate the controller procedures.

8.13 A safety hazard analysis has been completed and all identified risks were in the 'Low' category. The FAA will continue to apply best SMS practices throughout the demonstrations to identify any previously unforeseen hazards. The FAA will also collect metrics as to what actual

benefits are observed. As part of the analysis of the benefits of this procedure, a business case was conducted to assess benefits for both the service provider and the user. The results of the business case indicated that all parties would benefit through economic and environmental benefits.

8.14 The Sub-Group supported the ADS-C in-trail initiative and requested that the regional ATM groups be kept fully informed of the progress of the trial and any further developments.

**ICAO SARPS Amendment for additional Notice to Airman (NOTAM) Field for Cross-Reference of Digital Aeronautical Information and Legacy text NOTAM**

8.15 The United States presented proposal for the addition of a "Y Field" to the ICAO NOTAM, SNOWTAM and ASHTAM formats. The "Y Field" provides a mechanism to transition from legacy text-based notices to digital aeronautical information and the digital NOTAM. The "Y Field" contains a resource link that can be used to cross-reference to digital aeronautical information supporting the published ICAO compliant NOTAM.

8.16 The meeting assessed the value of the "Y field" as a means to transition textual NOTAM information to the digital environment, and considered the impact of a "Y field" on traditional NOTAM processing.-In response to query from Japan, the United States confirmed that the "Y field" would be filled out with tens characters of free text.

8.17 The meeting recognized the necessity for transition arrangements that support the transition from the existing NOTAM arrangements to the digital formats being implemented under AIXM, and gave full support to the concept that such transition arrangements should be standardized and harmonized over as many States as possible.

8.18 However, acknowledging that there was insufficient technical representation at the meeting to be able to make an informed decision on the United States proposal and that it was intended that the "Y field" proposal would be reviewed at the pending Global Conference in South Africa and the AIS-AIMSG in Montreal, the meeting would await updated information in due course. The Sub-Group requested the United States to continue the coordination efforts on this matter with a focus on any potential impacts in operational areas and provide updated information to appropriate forums including the Asia/Pacific AAITF as it became available.

**Data Link Operations and numbers of RNP 4 Aircraft in Fukuoka FIR**

8.19 Japan presented updated information on the operational trial of the 30 NM longitudinal separation in the Fukuoka FIR, and the current rate of RNP 4 approved aircraft in the Fukuoka FIR.

8.20 Prior to the introduction of the 30 NM separation, JCAB demonstrated the safety assessment in accordance with the provision of the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc. 4444). From the result of this evaluation, as a result of traffic congestion JCAB committed to using a 10 minutes periodic interval for the ADS report from aircraft equipped with the RNP 4 capability in the Fukuoka FIR, rather than the 14 minutes promulgated by ICAO.

8.21 The separation minimum is applied only between aircraft with RNP 4 approval. Between RNP 4 approved aircraft and RNP 4 non-approved aircraft, and between RNP 4 non-approved aircraft, the 50 NM, 10 minute with Mach number technique (MNT) or 15 minute longitudinal separation shall be applied. This separation reduction will provide aircraft with more opportunity to fly at an optimum altitude or closer to the optimum altitude than before as well as increasing airspace capacity and ATC flexibility to respond to operators requests.

8.22 At the end of 2005, the percentage of aircraft operating data link was about 40 percent, and this percentage was increasing by about 10 percent per year until the mid-2008. However, this upward trend turned downward in October 2008, perhaps as a result of global economic circumstances. The meeting recalled APANPIRG Conclusion 19/7, that Pacific operators be urged to equip with RNP 4 avionics as early as possible, and agreed that a survey of aircraft RNP 4 equipage and certification would be useful in establishing the current situation. Hong Kong, China reminded the meeting that Conclusion 19/7 had set the timeline of 2012 and therefore the survey should establish the intentions of operators in terms of equipage and certification. The Sub-Group agreed to the following draft Conclusion:

**Draft Conclusion SG19/16 – Survey of RNP 4 Equipage and Approvals**

That during 2010 the Regional Office conduct a regional survey to establish the current and near term equipage and approvals status for RNP 4 operations.

**RNAV 5 Preferential Operation in Japan**

8.23 Japan briefed the meeting on its RNAV 5 preferential operation, named "Sky Highway", which will be in force from October 2010 in domestic airspace of the Fukuoka FIR. In order to increase airspace capacity, improve efficiency and ensure safety, JCAB introduced parallel RNAV5 routes between major city pairs, and limited some RNAV 5 routes for one-way use. However, conventional VOR routes still exist in close vicinity to RNAV 5 routes and are available for flight planning of non-RNAV5 approved aircraft. This mix of traffic in the same airspace has caused increased controller workload.

8.24 Recognizing that increasing air traffic controller's workload means decreasing ATC capacity and in order to make the most of capacity enhancement using RNAV 5, JCAB plan to introduce airspace for preferential RNAV 5 operations named the Sky Highway Project. The Sky Highway is to separate flights on RNAV 5 routes and VOR routes operationally, with segregation above and below FL290.

**User Preferred Route (UPR) Implementation Updates**

8.25 Japan and the United States jointly presented an update on User Preferred Routes in the Pacific region, including the following information:

a) In December 2000, use of UPRs began between the United States and the South Pacific, replacing Pacific Organized Track System (PACOTS) generated tracks in that region of the Oakland OCA/FIR.

b) In September 2007, operational use of UPRs began between Japan and New Zealand/Caledonia.

c) In August 2008, operational trials of UPRs began between Asia and Hawaii. PACOTS tracks are also being generated during the trial phase.

d) An 8-week paper trial to test operational feasibility and efficiencies of UPRs between Japan and Australia concluded on 26 May 2008 and a second paper trial concluded on 24 November 2008.

e) An operational demonstration of UPRs between RJAA and YSSY/YBBN/YBCS/YBCG began on 4 May 2009. If no adverse impacts

are identified during the Operational Demonstration, the status of UPRs will be changed to the Operational Trial effective 4 June 2009.

f) An Operational Demonstration of PACOTS Track 14/15 aircraft UPRs is scheduled to begin in September of 2009.

g) Paper Trials are underway for PACOTS Track J/K/H/I aircraft.

8.26 Significant fuel savings and a consequent reduction in environmental impact have been achieved. Estimates of these savings have been calculated on an annualized basis as follows:

a) Russian Trans East UPRs
- 1.09 Million kilograms (kg) Fuel
- 3.41 Million kg carbon dioxide ($CO_2$ ) Emissions

b) California – South Pacific UPRs
- 9.61 Million kg Fuel
- 30.36 Million kg $CO_2$ Emissions

c) Japan – New Zealand/Caledonia UPRs
- 2.09 Million kg Fuel
- 6.54 Million kg CO2 Emissions

d) Asia – Hawaii UPRs
- 2.88 Million kg Fuel
- 9.1 Million kg $CO_2$ Emissions

e) RJAA – YSSY/YBBN/YBCG/YBCS UPRs
- 1.89 Million kg Fuel
- 5.91 Million kg $CO_2$ Emissions

8.27 The meeting noted the successful implementation of these UPRs and the significant fuel savings and reduced environmental impact achieved, and congratulated Japan and the United States for these outcomes.

**Continuous Descent Arrivals (CDA)**

8.28 Japan Civil Aviation Bureau (JCAB) began their initial Continuous Descent Arrivals (CDA) trial to Kansai International Airport (RJBB) from 7th May 2009. The CDA is a descent profile clearance which is cleared via radio communication to participating aircraft, currently comprising only Japanese air carriers.

8.29 The CDA trial provides the following savings;

- Reduced fuel burn and carbon dioxide (CO2) emissions by having the aircraft fly an optimized descent profile.
- Reduced noise pollution since the aircraft is flying a power off descent.
- Reduced engine wear

8.30 JCAB will continue operational trials for CDA at RJBB using only Japanese airlines over the next two or three months for evaluations. After evaluations, CDA will be applied to all

aircraft with ETA between 2300JST and 0700JST, being the less congested hours of the day. JCAB will continue to study and discuss with airline operators to extend time period at RJBB and possibility to establish for other airports.

**Atlantic Interoperability Initiative to Reduce Emissions (AIRE)**

8.31 The United States presented an information paper on the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) Partnership Phase II Oceanic Demonstration.

8.32 AIRE is working on efforts to integrate new technologies and procedures under NextGen and SESAR and will conduct a structured flight demonstration program to explore the potential environmental benefits of new aviation technologies and improved operational procedures. Phase II AIRE Oceanic demonstrations will provide metrics to quantify en route performance, identify changes in cruise efficiency, compare those changes to the reference oceanic baseline and to the cost of the user preferred trajectories.

8.33 The Phase II AIRE Oceanic Demonstration will be conducted over the two month period from June 2009 through July 2009. The candidate flights for the Phase II AIRE Oceanic Demonstration will be limited to westbound flights that enter North Atlantic Oceanic airspace from within the LPPO CTA, and proceed directly into the ZNY CTA. (Eastbound flights may be considered for later phases of AIRE Oceanic Demonstrations.)

8.34 The information was noted by the meeting.

**Update on the Activities of the Asia and South Pacific Initiative to Reduce Emissions (ASPIRE)**

8.35 The United States presented IP/15 providing the meeting with an update on the Asia and South Pacific Initiative to Reduce Emissions (ASPIRE) Partnership, that was initiated in February 2008.

8.36 Significant progress has been made in the last 12 months by the initial ASPIRE partners, Airservices Australia, Airways New Zealand and the U.S. FAA. The ASPIRE Strategic Plan has been produced to address three principle segments, including the recommended and proven best practices for various segments of flight; performance measurement; and definition of ASPIRE Work Programs.

8.37 The partners have successfully executed a series of “green” demonstration flights between September 2008 and November 2008 demonstrating significant fuel and emissions savings from

a) the harmonization of existing green procedures and technologies such as just-in-time fuelling, User Preferred Routes (UPRs) and RNP reduced pair-wise separation; and

b) the best-case management of controllable constraints such as taxi delays and low altitude vectoring. The partners have also initiated the development of shared performance metrics, and are currently working towards the expansion of ASPIRE to additional providers, and progressing activities identified in the ASPIRE Work Program “A” through collaboration under the Informal South Pacific ATS Coordinating Group (ISPACG).

**Eighth Meeting of ADS-B Study and Implementation Task Force**

8.38 An ADS-B Seminar and the Eighth Meeting of Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force (ADS-B SITF/8) were held in Ha Noi, Viet Nam from 18 to 22 May 2009. During the Seminar, a number of speakers from States, International organizations and Industry provided valuable information on the ADS-B. The ADS_B Seminar was well received by participants.

8.39 The ADS-B SITF/8 meeting formulated 2 draft Decisions and 5 Draft Conclusions and reconfirmed the significance of Conclusion 19/37 regarding the revised mandate for the regional ADS-B. States intending to implement ADS-B based surveillance service were urged to publish their mandate as soon as possible and no later than 2010 with the implementation target date after mid 2012.

8.40 The ADS-B SITF/8 meeting updated planning and implementation information contained in the FASID Table 4A and 4B and formulated a Draft Conclusion to amend these tables in accordance with established procedure. ADS-B SITF/8 endorsed a proposal presented by Viet Nam to add additional guidelines to the “Guidelines for development of ADS-B Implementation plan by States” adopted by APANPIRG/19.

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**
**ASIA AND PACIFIC OFFICE**

# ASIA/PACIFIC REGIONAL PERFORMANCE-BASED NAVIGATION IMPLEMENTATION PLAN

**Interim Edition**

**VERSION 0.2**

**PBN TF/4 March 2009**

**RECORD OF AMENDMENT**

| Version | Activity | Date |
|---|---|---|
| 0 | Adopted by APANPIRG/19 as Interim Edition | September 2008 |
| 0.1 | RASMAG Proposal | December 2008 |
| 0.2 | Amended/Finalized by PBN/TF/4 | March 2009 |

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# ASIA/PACIFIC REGIONAL PERFORMANCE-BASED NAVIGATION IMPLEMENTATION PLAN

## 1. Executive Summary

1.1 This Asia/Pacific Regional PBN Implementation Plan has been produced in line with Resolution A 36/23 adopted by ICAO Assembly in its 36th Session held in September 2007 and Conclusion 18/52 adopted by APANPIRG/18. The Regional PBN Plan addresses the strategic objectives for PBN implementation based on clearly established operational requirements, avoiding equipage of multiple on-board or ground based equipment, avoidance of multiple airworthiness and operational approvals and explains in detail contents relating to potential navigation applications. The Plan envisages the conduct of pre- and post-implementation safety assessments and continued availability of conventional air navigation procedures during transition. The Plan also discusses issues related to implementation which include traffic forecasts, aircraft fleet readiness, adequacy of ground-based CNS infrastructure etc. Implementation targets for various categories of airspace for the short term (2008 – 2012) and for the medium term (2013 – 2016) have been projected in tabular forms to facilitate easy reference. For the long term (2016 and beyond) it has been envisaged that GNSS will be the primary navigation infrastructure. It is also expected that precision approach capability using GNSS and its augmentation system will become available in the long term.

## 2. Explanation of Terms

2.1 The drafting and explanation of this document is based on the understanding of some particular terms and expressions that are described below:

2.1.1 **Asia/Pacific Regional PBN Implementation Plan.** A document adopted by APANPIRG, often referred to as the "Regional PBN Plan", offering appropriate guidance for air navigation service providers, airspace operators and users, regulating agencies, and international organizations on the evolution of navigation capabilities as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short, medium and long term in the APAC Region.

2.1.2 **Performance Based Navigation** Performance based navigation specifies RNAV and RNP system performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in an airspace.

2.1.3 **Performance requirements.** Performance requirements are defined in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept. Performance requirements are identified in navigation specifications which also identify which navigation sensors and equipment may be used to meet the performance requirement.

## 3. Acronyms

3.1 The acronyms used in this document along with their expansions are given in the following list

| | |
|---|---|
| ABAS | Aircraft-Based Augmentation System |
| AIS | Aeronautical Information Services |
| APAC | Asia and Pacific |
| APANPIRG | Asia/Pacific Air Navigation Planning and Implementation Regional Group |
| APCH | Approach |
| APV | Approach Procedures with Vertical Guidance |
| ATC | Air Traffic Control |
| Baro VNAV | Barometric Vertical Navigation |
| CNS/ATM | Communication Navigation Surveillance/Air Traffic Management |

| | |
|---|---|
| CPDLC | Controller Pilot Data Link Communications |
| DME | Distance Measuring Equipment |
| EMA | En-route Monitoring Agency |
| FASID | Facilities and Services Implementation Document |
| FIR | Flight Information Region |
| FMS | Flight Management System |
| GBAS | Ground-Based Augmentation System |
| GNSS | Global Navigation Satellite System |
| GRAS | Ground-based Regional Augmentation System |
| IATA | International Air Transport Association |
| IFALPA | International Federation of Air Line Pilots' Associations |
| INS | Inertial Navigation System |
| IRU | Inertial Reference Unit |
| PANS | Procedures for Air Navigation Services |
| PBN | Performance Based Navigation |
| PIRG | Planning and Implementation Regional Group |
| RASMAG | Regional Airspace Safety Monitoring Advisory Group |
| RCP | Required Communication Performance |
| RNAV | Area Navigation |
| RNP | Required Navigation Performance |
| SARP | Standards and Recommended Practices |
| SBAS | Satellite-Based Augmentation System |
| SID | Standard Instrument Departure |
| STAR | Standard Instrument Arrival |
| TMA | Terminal Control Area |
| VOR | VHF Omni-directional Radio-range |
| WGS | World Geodetic System |

## 4. Introduction

### Need for the regional PBN Implementation Plan

4.1 The Thirty-sixth Session of the ICAO Assembly held in Montreal in September 2007 adopted a Resolution to resolve that States and PIRGs complete a regional PBN implementation plan by 2009.

4.2 Recognizing that the PBN concept is now established, States should ensure that all RNAV and RNP operations and procedures are in accordance with the PBN concept as detailed in State letter AN 11/45-07/22 and the ICAO Doc 9613: PBN Manual for ensuring a globally harmonized and coordinated transition of PBN.

4.3 In view of the need for detailed navigation planning, it is advisable to develop a Regional PBN Plan to provide proper guidance to air navigation service providers, airspace operators and users, regulating agencies, and international organizations, on the evolution of navigation capabilities as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short and medium term in the APAC Region.

4.4 Furthermore, the Asia/Pacific Regional PBN Implementation Plan will contain the basic material serving as guidance for regional projects for the implementation of air navigation infrastructure, such as ABAS, SBAS, GBAS, GRAS, etc., as well as for the development of national implementation plans.

### Roles of Navigation in supporting ATM operations

4.5 An "airspace concept" may be viewed as a general vision or master plan for a particular airspace. Based on particular principles, an airspace concept is geared towards specific objectives. Strategic objectives drive the general vision of the airspace concept. These objectives are usually identified by airspace users, air traffic management (ATM), airports as well as environmental and government policy. It

is the function of the airspace concept and the concept of operations to respond to these requirements. The strategic objectives which most commonly drive airspace concept are safety, capacity, efficiency, access, and the environment.

4.6 Navigation is one of several enablers of an airspace concept. Communications, ATS Surveillance and ATM are also essential elements of an airspace concept.

4.7 The PBN–concept specifies RNAV and RNP system performance requirements in terms of accuracy, integrity, availability, continuity and functionality needed for the proposed operations in the context of a particular Airspace Concept, when supported by the appropriate navigation infrastructure. In that context, the PBN concept represents a shift from sensor-based to performance-based navigation. Performance requirements are identified in navigation specifications which also identify the choice of navigation sensors and equipment that may be used to meet the performance requirements. These navigation specifications are defined at a sufficient level of detail to facilitate global harmonization by providing specific implementation guidance for States and operators.

4.8 Under the PBN concept, the generic navigation requirements are defined based on operational requirements. Thus, users may evaluate the available options. To ensure synchronization of investment and interoperability of the airborne and ground systems, the selection of the solution should be in consultation with aviation stakeholders, including international and domestic airline operators, air navigation service providers, and regulators. The solution selected should also be the most cost-effective one.

4.9 The development of the PBN concept recognized that advanced aircraft RNAV systems are achieving an enhanced and predictable level of navigation performance accuracy which, together with an appropriate level of functionality, allows a more efficient use of available airspace to be realized. It also takes account of the fact that RNAV systems have developed over a 40-year period and as a result there were a large variety of differing implementations globally. Identifying navigation requirements rather than on the means of meeting the requirements will allow use of all RNAV systems meeting these requirements irrespective of the means by which these are met.

**Benefits of Performance-Based Navigation**

4.10 The main benefits derived from the implementation of PBN are:

a) Increased airspace safety through the implementation of continuous and stabilized descent procedures using vertical guidance;
b) Reduced aircraft flight time due to the implementation of optimal flight paths, with the resulting savings in fuel, noise reduction, and enhanced environmental protection;
c) Use of the RNAV and/or RNP capabilities that already exist in a significant percentage of the aircraft fleet flying in APAC airspace;
d) Improved airport and airspace arrival paths in all weather conditions, and the possibility of meeting critical obstacle clearance and environmental requirements through the application of optimized RNAV or RNP paths;
e) Implementation of more precise approach, departure, and arrival paths that will reduce dispersion and will foster smoother traffic flows;
f) Reduced delays in high-density airspaces and airports through the implementation of additional parallel routes and additional arrival and departure points in terminal areas;
g) Reduction of lateral and longitudinal separation between aircraft to accommodate more traffic;
h) Decrease ATC and pilot workload by utilizing RNAV/RNP procedures and airborne capability and reduce the needs for ATC-Pilot communications and radar vectoring;
i) Increase of predictability of the flight path.

**Goals & Objectives of PBN Implementation**

4.11 APANPIRG, in its Eighteenth meeting (September 2007), discussed various issues related to an early implementation of PBN in the region. To facilitate coordination between States, a PBN Task Force was formed under Conclusion 18/52 and tasked to develop a harmonized regional PBN implementation plan.

4.12 The Asia/Pacific Regional PBN Implementation Plan has the following strategic objectives:

a) To ensure that the implementation of the navigation item of the CNS/ATM system is based on clearly established operational requirements.
b) To avoid undue equipage of multiple on board equipment and/or ground-based systems.
c) To avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations.
d) To explain in detail the contents of the Regional Air Navigation Plan, relating to potential navigation applications.

4.13 Furthermore, the Asia/Pacific Regional PBN Implementation Plan will provide a high-level strategy for the evolution of the navigation applications to be implemented in the APAC Region in the short term (2008-2012) and medium term (2013-2016). This strategy is based on the concepts of Area Navigation (RNAV) and Required Navigation Performance (RNP) in accordance with ICAO Doc. 9613: *Performance Based Navigation Manual*, and will be applied to aircraft operations involving instrument approaches, standard departure (SID) routes, standard arrival (STAR) routes, and ATS routes in oceanic and continental areas.

4.14 The Regional PBN Plan was developed by the APAC States together with the international organizations concerned (including IATA and IFALPA)~~,~~ and is intended to assist the main stakeholders of the aviation community plan a gradual transition to the RNAV and RNP concepts. The main stakeholders of the aviation community that benefit from this Regional Plan are:

- Airspace operators and users.
- Air navigation service providers.
- Regulating agencies.
- International organizations.

4.15 The Regional PBN Plan is intended to assist the main stakeholders of the aviation community plan the future transition and their investment strategies. For example, airlines and operators can use this Plan to derive future equipage and additional navigation capability investments; air navigation service providers can plan a gradual transition for the evolving ground infrastructure. Regulating agencies will be able to anticipate and plan for the criteria that will be needed in the future.

4.16 Recognizing the safety benefits of PBN, the thirty-sixth session of the ICAO Assembly held in Montreal, September 2007 adopted a Resolution to resolve that States and PIRGs prepare ~~a~~ PBN implementation plans by 2009 to achieve:

a) Implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones; and
b) Implementation of APV (Baro-VNAV and/or augmented GNSS) for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014.

The ICAO Assembly also urges that States include in their PBN implementation plan provisions for implementation of APV to all runway ends serving aircraft with a maximum certificated take-off mass of 5700 kg or more, according to established timelines and intermediate milestones.

### Planning Principles

4.17 Planning for the implementation of PBN in the APAC Region shall be based on the following principles:

a) Pre- and post-implementation safety assessments will be conducted in accordance with ICAO provisions to ensure the application and maintenance of the established target levels of safety.
b) Continued application of conventional air navigation procedures during the transition period, to guarantee the operations by users that are not RNAV and/or RNP equipped.
c) The first regional PBN implementation plan should address the short term (2008-2012) and medium term (2013-2016) and take into account long term global planning issues.
d) Target date for preparation of the first regional PBN implementation plan is APANPIRG/19 (September 2007).

## 5. PBN Operational Requirements & Implementation Strategy

5.1 Introduction of PBN should be consistent with the Global Air Navigation Plan. Moreover, PBN implementation shall be in full compliance with ICAO SARPs and PANS and support relevant ICAO Global Plan Initiatives.

5.2 The ICAO Council accepted the second amendment to the Global Air Navigation Plan for the CNS/ATM System in November 2006. The approved plan has been renamed as Global Air Navigation Plan (Doc 9750). The relevant Global Plan Initiatives including implementation of performance based navigation (PBN) and navigation system have been included in the Global Plan. The introduction of PBN must be supported by an appropriate navigation infrastructure consisting of an appropriate combination of Global Navigation Satellite System (GNSS), self-contained navigation system (inertial navigation system) and conventional ground-based navigation aids.

5.3 The *Strategy for the Provision of Precision Approach, Landing & Departure Guidance Systems* and the *Strategy for Implementation of GNSS Navigation Capability* were reviewed and updated by the Eleventh meeting of CNS/MET Sub Group of APANPIRG in July 2007. The updated strategies were reviewed and adopted by APANPIRG as *Strategies for the Provision of Navigation Services* in its Eighteenth meeting held in September, 2007 under Conclusion 18/30.

### Route Operations

5.4 As the routes structure and en-route operation are extensive and complicated in APAC – region, it is difficult to restructure and include the whole airspace in a single implementation plan for en-route operations.

5.5 Considering the traffic characteristics and CNS/ATM capability, en-route operations can be classified as Oceanic, Remote continental, and Continental en-route.

5.6 In principle, each classification of en-route operation (paragraph 5.5 above) should adopt, but not be limited to, a single RNAV or RNP navigation specification. This implementation strategy should be applied by implementing States in coordination with airspace users.

5.7 APANPIRG established the PBN Task Force to develop a PBN implementation plan for the Asia/Pacific Region and to address related regional PBN implementation issues. Accordingly, States are encouraged to work cooperatively bilaterally, multilaterally and with the PBN Task Force to ensure regional and sub-regional harmonization of en-route PBN implementation.

5.8 In areas where operational benefits can be achieved and appropriate CNS/ATM capability exists or can be provided for a more accurate navigation specification than that specified in this plan, States are

encouraged to introduce the more accurate navigation specification on the basis of coordination with stakeholders and affected States.

5.9 Similarly, in circumstances where affected States are agreeable to completing an implementation in advance of the timelines specified in this plan, early implementation is encouraged on the basis of coordination between affected States and airspace users.

### TMA Operations

5.10 TMA operations have their own characteristics, taking into account the applicable separation minima between aircraft and between aircraft and obstacles. TMA operations also involve the diversity of aircraft, including low-performance aircraft flying in the lower airspace and conducting arrival and departure procedures on the same path or close to the paths of high-performance aircraft.

5.11 In this sense and as called for under APANPIRG Conclusion 18/53, States shall develop their own national plans for the implementation of PBN in sovereign TMAs. Such national plans should be based on the Asia/Pacific Regional PBN Implementation Plan, seek the harmonization of the application of PBN and avoid the need for multiple operational approvals for intra- and inter-regional operations. Applicable aircraft separation criteria should also be considered.

### Instrument Approaches

5.12 States are encouraged to introduce PBN approaches that provide Vertical Guidance to enhance safety. Conventional approach procedures and conventional navigation aids should be maintained to support non-equipped aircraft during the transitional period.

5.13 During early implementation of PBN, IFR Approaches based on PBN should be designed to accommodate a mixed-equipage (PBN and non-PBN) environment. ATC workload should be taken into account while developing approach procedures. One possible way to accomplish this is to co-locate the Initial Approach Waypoint for both PBN and conventional approaches

## 6. Current Status & Forecast

### APAC traffic forecast

6.1 Traffic forecasts have a special role to play in the planning and implementation processes; they represent the demand for future ATM. Global Air Navigation Plan (Doc 9750) requires that the Planning and Implementation Regional Groups (PIRGs) base their work on well developed traffic density forecasts. Guidance on the preparation of traffic forecasts is provided in *Manual on Air Traffic Forecasting* (Doc 8991). At the Asia/Pacific regional level, the traffic forecasting activities were started with the formation of ICAO Pacific Area Traffic Forecasting Group formed in 1991. The scope of the group was subsequently broadened to include Intra-Asia/Pacific traffic also and the group was renamed as Asia/Pacific Area Traffic Forecasting Group (APA TFG).

6.2 Report of the Fourteenth meeting of Asia/Pacific Area Traffic Forecasting Group (APA TFG/14) has been published as Doc 9915. Report includes medium term forecasts of air traffic in the Transpacific area and for selected Transpacific and Asia/Pacific city pair markets through 2012. Report also contains a long term forecast with a horizon to the year 2015 and the short term forecast for the period 2008 – 2010 and intermediate forecasts for each of the years 2015 and 2020.

6.3 The February 2008 forecast prepared by IATA for APAC traffic in respect of passenger, cargo, aircraft movements and new aircraft deliveries in the Regions is also provided in the Appendix B to this plan as reference.

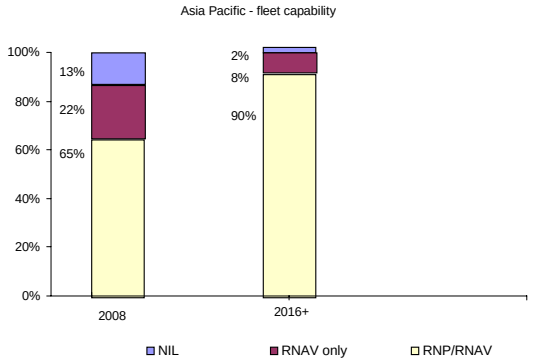
### Aircraft fleet readiness status

6.4 2007 was a record year for Asia/Pacific airlines with 418 new aircraft deliveries and more than 1,000 new orders. The overall number of deliveries to Asia/Pacific based airlines in 2008 is expected to total 430 aircraft.

6.5 All major commercial aircraft manufacturers since the 1980's have included RNAV capabilities. The commercial aircraft currently produced incorporate an RNP capability.

6.6 One significant issue for PBN implementation today is directly related to the multitude of FMS installations and varying degrees of capabilities associated with the current fleet of RNAV aircraft. Specifically, there are numerous FMS systems installed in today's fleets, all with varying capabilities.

6.7 The diagram below displays a high level analysis based on fleet numbers from Ascend Online Fleets database March 2008 and RNAV/RNP classification by IATA.




### CNS Infrastructure

### Navigation infrastructure

*Global Navigation Satellite System (GNSS)*

6.8 Global Navigation Satellite System (GNSS) is a satellite-based navigation system utilizing satellite signals, such as Global Positioning System (GPS), for providing accurate and reliable position, navigation, and time services to airspace users. In 1996, the International Civil Aviation Organization (ICAO) endorsed the development and use of GNSS as a primary source of future navigation for civil aviation. ICAO noted the increased flight safety, route flexibility and operational efficiencies that could be realized from the move to space-based navigation.

6.9 GNSS supports both RNAV and RNP operations. Through the use of appropriate GNSS augmentations, GNSS navigation provides sufficient accuracy, integrity, availability and continuity to support en-route, terminal area, and approach operations. Approval of RNP operations with appropriate certified avionics provides on-board performance monitoring and alerting capability enhancing the integrity of aircraft navigation.

6.10 GNSS augmentations include Aircraft-Based Augmentation System (ABAS), Satellite-Based Augmentation System (SBAS), Ground-Based Augmentation System (GBAS), and Ground-based Regional Augmentation System (GRAS).

### Other PBN navigation infrastructure

6.11 Other navigation infrastructure includes INS, VOR/DME, DME/DME, and DME/DME/IRU. These navigation infrastructures may satisfy the requirements of RNAV navigation specifications, but not those of RNP.

6.12 INS may be used to support PBN en-route operations with RNAV 10 and RNAV 5 navigation specifications.

6.13 VOR/DME may be used to support PBN en-route and STAR operations based on the RNAV 5 navigation specification.

6.14 Uses of DME/DME and DME/DME/IRU may support PBN en-route and terminal area operations based on RNAV 5, RNAV 2 or RNAV 1 navigation specifications. Validation of DME/DME coverage area and appropriate DME/DME geometry should be conducted to identify possible DME/DME gaps, including identification of critical DMEs, and to ensure proper DME/DME service coverage.

### Surveillance infrastructure

6.15 For RNAV operations, States should ensure that sufficient surveillance coverage is provided to assure the safety of the operations. For RNP operations, surveillance coverage may not be required. Details on the surveillance requirements for PBN implementation can be found in the ICAO PBN Manual and ICAO PANS-ATM (Doc 4444), and information on the current existing surveillance infrastructure in APAC can be found in ICAO FASID tables.

### Communication infrastructure

6.16 Implementation of RNAV/RNP routes includes communication requirements. Details on the communication requirements for PBN implementation can be found in ICAO PANS-ATM (Doc 4444), ICAO RCP Manual (Doc 9869), and ICAO Annex 10. Information on the current existing communication infrastructure in APAC can also be found in ICAO FASID tables.

## 7. Implementation Plan for Performance Based Navigation

### ATM Operational Requirements

7.1 The Global ATM Operational Concept (Doc 9854) makes it necessary to adopt an airspace concept able to provide an operational scenario that includes route networks, minimum separation standards, assessment of obstacle clearance, and a CNS infrastructure that satisfies specific strategic objectives, including safety, access, capacity, efficiency, and environment.

7.2 In this regard, the following programmes will be developed:

a) traffic and cost benefit analyses
b) necessary updates on automation
c) operational simulations in different scenarios
d) ATC personnel training
e) Flight plan processing
f) Flight procedure design training to include PBN concepts and ARINC-424 coding standard
g) Enhanced electronic data and processes to ensure appropriate level of AIS data accuracy, integrity and timeliness
h) WGS-84 implementation in accordance with ICAO Annex 15
i) iuniform classification of adjacent and regional airspaces, where practicable
j) RNAV/RNP applications for SIDs and STARs

k) Coordinated RNAV/RNP routes implementation
l) RNP approach with vertical guidance

**Short Term Implementation Plan**

**Route Operations**

7.3 During the planning phase of any implementation of PBN routes, States should gather inputs from all aviation stakeholders to obtain operational needs and requirements. These needs and requirements should then be used to derive airspace concepts and to select appropriate PBN navigation specification.

7.4 In this phase, the application of RNAV 10 and RNP 4 navigation specifications is expected for Oceanic and Remote continental routes. Prior to implementation of RNP 4, States should consider air traffic demands, ATC workload, surveillance and communication capabilities and fleet readiness statistics, and consult all stakeholders.

7.5 For Continental routes, the application of RNAV 5 and RNAV 2 navigation specifications is expected. In the continental en-route areas of operation, States may choose to implement RNAV 2 routes to enhance efficiency of airspace usage and support closer route spacing, noting that appropriate communication and surveillance coverage must be provided. The RNAV 2 navigation specification can also be used in airspace~~,~~ where sufficient CNS capability is provided and there are operational benefits.

**TMA Operations**

7.6 In selected TMAs, the application of RNAV 1 in a radar environment can be supported though the use of GNSS or ground navigation infrastructure, such as DME/DME and DME/DME/IRU. In this phase, mixed operations (equipped and non-equipped) will be permitted.

7.7 In a non-radar environment and/or in an environment without adequate ground navigation infrastructure, the SID/STAR application of Basic-RNP1 is expected in selected TMAs with exclusive application of GNSS. In this phase, mixed operations (equipped and non-equipped) will be permitted.

**Instrument Approaches**

7.8 The application of RNP APCH with Baro-VNAV procedures is expected to be implemented in the maximum possible number of airports, commencing primarily with international airports. To facilitate transitional period, conventional approach procedures and conventional navigation aids should be maintained for non-equipped aircraft.

7.9 States should promote the use of APV operations (Baro-VNAV or augmented GNSS) to enhance safety and accessibility of RNP approaches.

7.10 The application of RNP AR APCH procedures should be considered in selected airports, where obvious operational benefits can be obtained due to the existence of significant obstacles.

**Summary table & Implementation targets**

| **Short Term (2008-2012)*** | | |
|---|---|---|
| **Airspace** | **Preferred Nav. Specifications** | **Acceptable Nav. Specifications** |
| Route – Oceanic | RNP 4 | RNAV 10 |
| Route – Remote continental | RNP 4 | RNAV 10 |
| Route – Continental en-route | RNAV 2, RNAV 5 | |
| TMA – Arrival | RNAV 1 in radar environment and with adequate navigation infrastructure.<br><br>Basic-RNP 1 in non-radar environment | |
| TMA – Departure | RNAV 1 in radar environment and with adequate navigation infrastructure.<br><br>Basic-RNP 1 in non-radar environment | |
| Approach | RNP APCH with Baro-VNAV in most possible airports<br><br>RNP AR APCH in airport where there are obvious operational benefits. | |

**Implementation Targets**

- RNP APCH (with Baro-VNAV) in 30% of instrument runways by 2010 and 50% by 2012 and priority should be given to airports with operational benefits
- RNAV 1 SID/STAR for 50% of international airports by 2010 and 75% by 2012 and priority should be given to airports with RNP Approach
- Re-defining existing RNAV/RNP routes into PBN navigation specification by 2012
- Implementation of additional RNAV/RNP routes

*** Note:** Early completion of an implementation is encouraged within the timeframe on the basis of coordination between affected States and airspace users.

**Medium Term Implementation Plan**

**Route Operations**

7.11 Noting the current development of route spacing standards for RNAV 1, RNAV 2, RNP 2, in this phase, it is expected that the implementations of all existing RNAV/RNP routes are consistent with PBN standards. States are encouraged~~,~~ to harmonize their RNAV/RNP routes based on consistent PBN navigation specifications and separation standards. Implementations of additional RNAV/RNP routes are also encouraged.

7.12 With the utilization of ADS and CPDLC, the application of RNP routes in the Oceanic and Remote continental airspace in the APAC Region is expected. This will permit the use of smaller lateral and longitudinal separation, such as 30 NM based on the RNP 4 navigation specification. States should also consider the fleet readiness status during their planning.

7.13 Noting the current development of RNP 2 navigation specification, in this phase, the application of RNP 2 is expected for the continental en-route airspace with high air traffic density. Depending on the sufficiency of DME/DME coverage or GNSS availability, States may consider the use of RNAV 2 navigation specification.

7.14 In this phase, the establishment of a backup system in case of GNSS failure or the development of contingency procedures will be necessary.

**TMA Operations**

7.15 Noting the current development of Advanced RNP 1 navigation specification, in this phase, it is expected that the application of RNAV 1 or RNP 1 will be expanded in selected TMAs. The application of RNAV 1/RNP 1 will also depend on DME/DME infrastructure, GNSS availability and aircraft navigation capability. In TMAs of high air traffic complexity and movement, the use of RNAV 1 or RNP 1 equipments will be mandatory. In TMAs of less air traffic complexity, mixed operations will be permitted (equipped or non-equipped).

**Instrument Approaches**

7.16 In this phase, the extended application of RNP APCH with Baro-VNAV or APV in most airports is expected. These applications may also serve as a back-up to precision approaches and provide vertical guided approaches for the runways without precision approach capability.

7.17 The extended application of RNP AR Approaches is expected for airports where there are operational benefits.

7.18 The introduction of application of landing capability using GNSS and its augmentations is expected to guarantee a smooth transition toward high-performance approach and landing capability.

**Summary table & Implementation targets**

| Medium Term (2013-2016)* | | |
|---|---|---|
| **Airspace** | **Preferred Nav. Specification** | **Acceptable Nav. Specification** |
| Route – Oceanic | RNP 2**, RNP 4 | RNAV 10 |
| Route – Remote continental | RNP 2 | RNAV 2, RNP 4, RNAV 10 |
| Route – Continental en-route | RNAV 1, RNP 2 | RNAV 2, RNAV 5 |
| TMA – Arrival | Expand RNAV 1 or RNP 1 application<br><br>Mandate RNAV 1 or RNP 1 approval for aircraft operating in higher air traffic density TMAs | |
| TMA – Departure | Expand RNAV 1 or RNP 1 application<br><br>Mandate RNAV 1 or RNP 1 approval for aircraft operating in higher air traffic density TMAs | |
| Approach | Expansion of RNP APCH (with Baro-VNAV) and APV<br><br>Expansion of RNP AR APCH where there are operational benefits<br><br>Introduction of landing capability using GNSS and its augmentations | |
| **Implementation Targets**<br>• RNP APCH with Baro-VNAV or APV in 100% of instrument runways by 2016<br>• RNAV 1 or RNP 1 SID/STAR for 100% of international airports by 2016<br>• RNAV 1 or RNP 1 SID/STAR for 70% of busy domestic airports where there are operational benefits<br>• Implementation of additional RNAV/RNP routes | | |

*** Note 1:** In circumstances where affected States are agreeable to completing an implementation in advance of the timeline, early implementation is encouraged on the basis of coordination between affected States and airspace users.

** **Note 2:** Related CNS requirements and operational procedures for RNP 2 application in Oceanic Airspace are yet to be determined.

**Long Term Implementation Strategies (2016 and beyond**)

7.19 In this phase, GNSS is expected to be a primary navigation infrastructure for PBN implementation. States should work co-operatively on a multinational basis to implement GNSS in order to facilitate seamless and inter-operable systems and undertake coordinated research and development programmes on GNSS implementation and operation.

7.20 Moreover, during this phase, States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance.

7.21 With the expectation that precision approach capability using GNSS and its augmentation systems will become available, States are encouraged to explore the use of such capability where there are operational and financial benefits.

## 8. Transitional Strategies

8.1 During transition to PBN, sufficient ground infrastructure for conventional navigation systems must remain available to serve non-equipped flights. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip appropriately to attain equivalent PBN-based navigation performance. States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised. Performance of safety assessments and consultation with users through regional air navigation planning processes will be necessary.

8.2 States should coordinate to ensure that harmonized separation standards and procedures are developed and introduced concurrently in all flight information regions along major traffic flows to allow for a seamless transition towards PBN.

8.3 States should cooperate on a multinational basis to implement PBN in order to facilitate seamless and inter-operable systems and undertake coordinated research and development programmes on PBN implementation and operation.

8.4 States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance**,** taking due consideration of the needs of State aircraft.

8.5 States should encourage operators and other airspace users to equip with PBN-capable avionics. This can be achieved through early introductions of RNP approaches, preferably those with vertical guidance.

8.6 ICAO Asia-Pacific Regional Office should provide leadership supporting implementation and transition towards PBN.

## 9. Safety Assessment & Monitoring Requirements

### Need for a safety assessment

9.1 To ensure that the introduction of PBN applications within the Asia/Pacific Region is undertaken in a safe manner, in accordance with relevant ICAO provisions implementation shall only take place following conduct of a safety assessment by the implementing State or group of States that demonstrates that an acceptable level of safety will be met. This assessment may also need to demonstrate that residual levels of risk associated with specific PBN implementations are acceptable. Additionally, after implementation ongoing periodic safety reviews shall be undertaken by the implementing State or group of States, where required, in order to establish that operations continue to meet acceptable levels of safety.

### En-route safety assessment and monitoring

9.2 When considering en-route PBN implementations, the ICAO *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444, Chapter 5, Section 5.4) contains procedures and RNAV procedural separation minima for use in the separation of aircraft in the en-route phase. In some cases, these separation minima require specific RNP capabilities and are based on collision risk modelling which determines communications and surveillance requirements. However, this modelling does not include all operational and technical aspects and is dependent upon parameter values that may vary depending on the particular airspace where the separation minimum will be applied. Therefore, prior

to implementation, a system verification of sufficient duration and integrity must be performed to assess such parameters and conditions including weather deviations or other contingency events for the airspace concerned and to demonstrate that operational and technical requirements will be met.

9.3 APANPIRG has established the Regional Airspace Safety Monitoring Advisory Group (RASMAG) to facilitate the airspace safety monitoring aspects for implementations of reduced separation minima and CNS/ATM applications within the Asia and Pacific Regions. RASMAG has adopted the term En-route Monitoring Agency (EMA) to describe an organization providing airspace safety assessment, monitoring and implementation services for international airspace in the Asia/Pacific region to assist the implementation and operation of reduced horizontal (lateral and longitudinal) separation minima. To ensure regional harmonization of en-route safety assessment requirements and methodologies, implementing States are encouraged to work cooperatively with RASMAG who will provide guidance and technical assistance to States to support their en-route PBN implementations.

**Undertaking a safety assessment**

9.4 The implementing State or group of States shall ensure that a safety assessment and, where required, ongoing monitoring of PBN implementations are conducted. The implementing State or group of States may have the capability to undertake such activities or, in the case of en-route implementations, may seek assistance from an En-route Monitoring Agency. The latter course of action is preferred as an EMA can establish the necessary monitoring and data collection activity in an effective manner for the international airspaces in which the EMA holds responsibility.

9.5 In undertaking a safety assessment to enable en-route implementation of PBN, a State authority or EMA shall:

1) Establish and maintain a database of PBN approvals;
2) Pre-implementation - conduct safety and readiness assessments and, for international implementations, report results to RASMAG;
3) Post-implementation - maintain awareness of data link performance and monitor aircraft horizontal-plane navigation performance and the occurrence of large navigation errors (lateral and longitudinal), implement remedial actions as necessary and, for international implementations, report results to RASMAG;
4) Monitor operator compliance with State approval requirements after PBN implementation;
5) Initiate necessary remedial actions in any instances where PBN requirements are not met.

9.6 Detailed information relating to the international airspace jurisdiction, roles and responsibilities of regional EMAs is contained in the *Asia/Pacific En-route Monitoring Agency Handbook*, which is available from the ICAO Asia/Pacific Regional Office.

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## Appendix A – CHANGES TO THE ASIA/PACIFIC REGIONAL PBN IMPLEMENTATION PLAN

Whenever a need is identified for a change to this document, the Request for Change (RFC) Form (see below) should be completed and submitted to the ICAO Asia and Pacific Regional Office. The Regional Office will collate RFCs for consideration by the Performance Based Navigation Task Force (CNS/MET Sub-group of APANPIRG).

When an amendment has been agreed by a meeting of the Performance Based Navigation Task Force then a new version of the PBN Regional Plan will be prepared, with the changes marked by an "|" in the margin, and an endnote indicating the relevant RFC, so a reader can see the origin of the change. If the change is in a table cell, the outside edges of the table will be highlighted; e.g.:

| | | |
|---|---|---|

Final approval for publication of an amendment to the PBN Regional Plan will be the responsibility of APANPIRG.

**PBN Regional Plan REQUEST FOR CHANGE FORM**

| **RFC Nr:** | |
|---|---|

Please use this form when requesting a change to any part of this PBN Regional Plan. This form may be photocopied as required, emailed, faxed or e-mailed to ICAO Asia and Pacific Regional Office +66 (2) 537-8199 or icao_apac@bangkok.icao.int

| | | |
|---|---|---|
| **1. SUBJECT:** | | |
| **2. REASON FOR CHANGE:** | | |
| **3. DESCRIPTION OF PROPOSAL: [expand / attach additional pages if necessary]** | | |
| **4. REFERENCE(S):** | | |
| **5. PERSON INITIATING:** | | **DATE:** |
| **ORGANISATION:** | | |
| **TEL/FA/X/E-MAIL:** | | |
| | | |

| 6. CONSULTATION | | RESPONSE DUE BY DATE: | |
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| **Organization** | **Name** | **Agree/Disagree** | **Date** |
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| **7. ACTION REQUIRE :** | |
| **8. PBN REGIONAL PLAN EDITOR** | **DATE REC'D :** |
| **9. FEEDBACK PASSED** | **DATE :** |

**AMENDMENT RECORD**

| Amendment Number | Date | Amended by | Comments |
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## Appendix B – IATA Traffic Forecast

"By 2010 Asia will be the largest single market for aviation" - IATA 27th Feb 2008. Globally predicted passenger traffic will rise by 4.9 per cent per year between 2007 and 2026, almost trebling in two decades as jet planes got bigger and more people flew on them. Meanwhile airfreight will rise by 5.8 per cent annually in the same period.The greatest demand will come from the Asia-Pacific region, where airlines will take delivery of 31 per cent of new planes in the next 20 years, compared with 24 per cent for Europe and 27 per cent for North America.

**Passenger**
Asia Pacific airlines saw a marginal drop in demand growth from 6.2 per cent in December 2007 to 5.7 per cent in January 2008. Currently, airlines in the region benefited from increased competitiveness due to the strong Euro and the booming economies of both India and China.

**Cargo**
Steady year-on-year airfreight growth of 4.5 per cent was recorded in January 2008. In the larger freight markets there is continued strength. Asia Pacific airlines saw demand increase 6.5 per cent, up from 6 per cent in December 2007, boosted by the booming economies in China and India.

For the period 2002-2020 aircraft movements are expected to increase at an annual growth rate of 5.4 per cent, to reach almost 294 thousand aircraft movements by the year 2020. Average annual growth rates of 6.5, 5.7 and 5.2 per cent are forecast for the periods 2005 - 2010, 2010-2015 and 2015 - 2020, respectively.

| TRANSPACIFIC PASSENGER FORECAST | | | |
|---|---|---|---|
| | | | |
| **Average Annual Percentage Growth Rates** | | | |
| | Low | Medium | High |
| | | | |
| 2005-2010 | 5.3 | 6.5 | 7.8 |
| 2010-2015 | 4.5 | 5.7 | 7.0 |
| 2015-2020 | 4.0 | 5.2 | 6.5 |
| | | | |
| 2002-2020 | 4.1 | 5.4 | 6.7 |

The Intra-Asia/Pacific passenger aircraft movements are expected to increase at an average annual growth rate of 4.6 per cent to the year 2020. The growth rates for the intermediate periods of 2005-2010, 2010-2015 and 2015-2020 are 5.0, 4.3 and 4.2 per cent, respectively.

| INTRA ASIA /PACIFIC AIRCRAFT MOVEMENT FORECAST | | | |
|---|---|---|---|
| | | | |
| **Average Annual Percentage Growth Rates** | | | |
| | Low | Medium | High |
| | | | |
| 2005-2010 | 3.6 | 5.0 | 5.5 |
| 2010-2015 | 3.1 | 4.3 | 5.2 |
| 2015-2020 | 3.1 | 4.2 | 5.2 |
| | | | |
| 2002-2020 | 3.3 | 4.6 | 5.6 |

**New Aircraft Deliveries by Region**
Record new aircraft orders were placed by the airline industry in 2005 – 2007. The large numbers of new orders represent strong confidence in the future prospects of the global airline industry. In its latest forecast of aviation growth, European aircraft maker Airbus said the world's fleet of large

passenger jets (of more than 100 seats) would double in the next 20 years to nearly 33,000. The greatest demand will come from the Asia-Pacific region, where airlines will take delivery of 31 per cent of new planes in the next 20 years, compared with 24 per cent for Europe and 27 per cent for North America.

| **New Aircraft Deliveries by Region** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012+** |
|---|---|---|---|---|---|---|---|
| | Existing | | | | | | |
| **Africa** | **665** | **26** | **15** | **20** | **16** | **13** | **28** |
| **Asia Pacific** | **3,578** | **329** | **428** | **407** | **344** | **267** | **440** |
| **Europe** | **5,301** | **292** | **348** | **364** | **251** | **153** | **297** |
| **Latin America/Caribbean** | **1,031** | **93** | **91** | **45** | **66** | **43** | **65** |
| **Middle East** | **626** | **41** | **57** | **44** | **36** | **27** | **164** |
| **North America** | **6,987** | **240** | **293** | **309** | **222** | **163** | **412** |
| | | | | | | | |
| **Total** | **18,188** | **1,026** | **1,237** | **1,208** | **944** | **679** | **1,551** |
| | | | | | | | |
| **Increase in Global aircraft fleet (%)** | **4.2** | **4.9** | **4.6** | **4.9** | **3.4** | **2.4** | **2.4** |

**Appendix C -** Reference documentation for developing operational and airworthiness approval

**TO BE DEVELOPED.**

**Appendix D** – Practical Example of tangible benefits

**TO BE DEVELOPED.**

# AGENDA ITEM 9: DEFICIENCIES IN THE AIR NAVIGATION FIELD

**Agenda Item 9: Deficiencies in the Air Navigation field**

9.1 APANPIRG/18 (September 2007, Bangkok) noted the key requirements essential for the successful implementation of the procedures contained in the Asia Pacific Supplement to the Uniform Methodology and the necessity to update the Supplement to include the provision of a regional on-line database for deficiencies, adopting Conclusion 18/60 accordingly. These matters were further reviewed by the 44th Conference of Asia/Pacific Directors General (44th DGCA Conference, October 2007) and the following action item was raised:

**Action Item 44/1** **Resolution of Deficiencies**

Recognizing the adverse impact on safety, efficiency and regularity of air transport and noting the deliberations on elimination of deficiencies expressed in APANPIRG Conclusions 18/60 and 18/62, the Conference strongly urged the Asia Pacific States listed in the APANPIRG List of deficiencies to:

a) designate a contact officer to coordinate with ICAO Regional Office on matters related to deficiencies;

b) develop corrective action plans with fixed target dates for resolution of safety related deficiencies and inform the ICAO Regional Office;

c) collaborate in resolving of the safety related deficiencies according to the established action plans; and

d) consider utilizing the services of the ICAO Technical Cooperation Bureau and/or other suitable cooperative arrangements for rectification of deficiencies.

9.2 The meeting recalled that the Asia/Pacific Online Air Navigation Deficiencies Data Base was maintained by the Regional Office and was accessible via the Regional Office website. The main objective of the online database is to foster the resolution of the safety-related deficiencies through increased transparency and information sharing between the States, the international organizations and the users concerned. This is in line with the principle of transparency in the ICAO Global Aviation Safety Plan (GASP).

9.3 The meeting learned that RASMAG/11 (June 2009) had reviewed the Deficiencies List, noting that Myanmar and Papua New Guinea (PNG) had previously been included on the list as a result of the non submission of safety data to RMAs. In the case of Myanmar, the difficulties had been resolved and RASMAG agreed to recommend to APANPIRG that Myanmar be removed from the list. However, although the situation with PNG had improved data submission was still not full reliable, so PNG would be retained on the list. Additionally, data submission from Bangladesh and Lao PDR has been incomplete or absent so RASMAG recommended to APANPIRG that these two States be added to the Deficiencies List.

9.4 The meeting noted the outcomes of efforts by APANPIRG/18 and 19 to address the air navigation deficiencies, and reviewed and updated the list of the Air Navigation Deficiencies, as shown in **Appendix A** to the Report on Agenda Item 9. The List would be presented to APANPIRG/20 in September 2009 for adoption.

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

***(updated ~~5 September 2008~~ 26 June 2009 by ATM/AIS/SAR/SG/19)***

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| ATS Routes | | | | | | | | |
| Requirements of Part VIII, Table ATS 1 of the Air Navigation Plan | India/Nepal | A473 - Not implemented | 16/3/99 | A new proposal was submitted in mid-2003 by Nepal. This is being coordinated by AAI with defense authorities. | Nepal - propose to delete A473 from BANP. India submitted the proposal in March 2008. Nepal yet to submit. | Nepal | Item captured in Chapter 2 of the Route Catalogue. APANPIRG/19 (September 2008) updated re progress. | B |
| | China | B591 - Partially implemented | 22/7/97 | | China will consider future imeplementation. | China | Reviewed by ARNR/TF. Item captured in Chapter 2 of the Route Catalogue. ATM/AIS/SAR/G/16 (June 2006) updated - route implemented in Shanghai FIR, however implementation is not in accordance with BANP, further implementation TBD | B |
| | Philippines/Thailand/ Viet Nam | G473 - Partially implemented | 24/11/93 | Co-ordination is in progress among States and ICAO. | ~~Philippines/ Thailand/Viet Nam propose deletion from BANP. States need to submit amendment proposals to Regional Office.~~ICAO - process the amendment the BANP | ~~Philippines Thailand/Viet Nam~~ICAO | Superseded by the re-structure of the South China Sea (SCS) route in 2001. Accordingly, SEACG/15 (May 2008, Bangkok) was informed that Thailand and States concerned agreed with the deletion of G473. | B |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| | China | R216 - Not implemented | 24/11/93 | China advised current route B215 KUQA A460 REVKI to Alma Ata met the requirements for traffic from Urumqi to Alma Ata and requests deletion of R216 from BANP (14 Apr 03). | CAAC will coordinate with Kazakhstan to delete R216 from BANP. | China/Kazakhstan ICAO | Captured in Chapter 2 of the Route Catalogue. | B |
| | Cambodia/Lao PDR/Thailand | R345 - Not implemented. ~~Under the c~~Coordination process completed. | 24/11/93 | | | Cambodia~~/Lao PDR/ Thailand~~ needs to submit joint amendment proposal to Regional Office | Item captured in Chapter 2 of the Route Catalogue. | B |
| | Indonesia | R459 - Implemented as W51 and W36 | 24/11/93 | ICAO has requested Indonesia to implement as R459. | Indonesia, Singapore - consider implementation of the route with designator L504. | Indonesia/Singapore | To be implemented as L504. Target implementation date TBD | B |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| WGS-84 | | | | | | | | |
| Requirements of Paragraph 3.6.4 of Annex 15 | Bhutan | WGS-84 - Not implemented | 2/7/1999 | Data conversion completed, but not published | | Bhutan | TBD | A |
| | Cambodia | WGS-84 - Partially implemeted | 28/6/2001 | Cambodia reported to ATM/AIS/SAR/SG/18 on 26 June 2008 that WGS-84 coordinates had been implemented at international airports, airspace and international routing. Domestic airports and routes have not been implemented with WGS-84. | | Cambodia | 2009/2010 | A |
| | China | WGS-84 - Patially implemented<br>* implemented in the Sanya FIR as of 1 Nov 2001 | 2/7/1999 | Differences to Annex 15 - *Aeronautical Information Services* are notified | | China | China advised APANPIRG/19 that WGS 84 implementation is in progress and planned to be completed in 2010 for all existing airports. All new airports will use WGS84 immediately. | A |
| | DPR Korea | WGS-84 - Not implemented | | | | DPR Korea | DPRK advised ATM/AIS/SAR/SG/18 verbally that WGS 84 implementation was completed. The Regional Office is waiting for a formal report. | A |
| | Kiribati | WGS-84 - Not implemented | | | | Kiribati | TBD | A |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| | Nauru | WGS-84 - Not implemented | | Conferring with consultant | | Nauru | TBD | A |
| | Solomon Islands | WGS-84 - Not implemented | | | | Solomon Islands | 1999 | A |
| | Vanuatu | WGS-84 - Implemented at main airports | 2/7/1999 | | | Vanuatu | 1999 | A |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| Airspace Classification | | | | | | | | |
| Requirements of Paragraph 2.6 of Annex 11 | China | Airspace Classification - Not implemented | 7/7/99 | | Difference to Annex 11 is published in AIP, China. | China | APANPIRG/19 updated, implementation planned by end 2010. | A |
| | ~~DPR Korea~~ | ~~Airspace Classification - Not implemented~~ | ~~7/7/99~~ | | | ~~DPR Korea~~ | ~~mid 2009~~completed in July 2009 | ~~A~~ |
| | Kiribati | Airspace Classifcation - Not implemented | 7/7/99 | | | Kiribati | TBD | A |
| | Nauru | Airspace Classification - Not implemented | 7/7/99 | | | Nauru | TBD | A |
| | Papua New Guinea | Airspace Classification - Not implemented | 7/7/99 | | | Papua New Guinea | Project in place | A |
| | Solomon Islands | Airspace Classification - Not implemented | 7/7/99 | | | Solomon Islands | TBD | A |
| | Viet Nam | Airspace Classification - Not implemented | 7/7/99 | | | Viet Nam | ~~APANPIRG/19~~ATM/AIS/SAR/SG/19 updated, for ~~first~~fourth quarter 2009 | A |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| AIP Format | | | | | | | | |
| Requirements of Chapter 4 of Annex 15 | Cook Islands | AIP Format - Not implemented | 7/7/99 | | | Cook Islands | ATM/AIS/SAR/G/16 (June 2006) updated - AIP COOK ISLANDS in new format in progress with assistance of New Zealand, effective date by the end of 2008 | A |
| | Kiribati | AIP Format - Not implemented | 7/7/99 | | | Kiribati | ATM/AIS/SAR/SG/18 (June 2009) was advised AIP in draft stage | A |
| | Nauru | AIP Format - Not implemented | 7/7/99 | | | Nauru | ATM/AIS/SAR/SG/18 (june 2008) was advised work soon to start | A |
| | Papua New Guinea | AIP Format - Not implemented | 7/7/99 | | | Papua New Guinea | TBA | A |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| SAR capability | | | | | | | | |
| Requirements of Annex 12 | Cook Islands | Annex 12 requirements not implemented.<br>No agreements with adjacent States. | 31/1/95 | | Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States<br>ICAO - assist to develop SAR capability and to co-ordinate with adjacent States | Cook Islands | 2009. SAR agreement with New Zealand completed 2007. | U |
| | Maldives | Annex 12 requirements not implemented.<br>No agreements with adjacent States. | 24/4/97 | SAR services and facilites provided (details to be confirmed).<br>SAR agreements with neighbouring States under development | Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States<br>ICAO - assist to develop SAR capability and to co-ordinate with adjacent States | Maldives | 2009 | U |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| Carriage of ACAS II | | | | | | | | |
| Requirement of Chapter 6 of Annex 6 | Bhutan | Annex 6 requirement not implemented. | 26/8/05 | | Bhutan - implement Annex 6 as required. | Bhutan | TBD | U |
| | Cook Islands | Annex 6 requirement not implemented. | 26/8/05 | | Cook Island - implement Annex 6 as required. | Cook Islands | TBD | U |
| | Kiribati | Annex 6 requirement not implemented. | 26/8/05 | | Kiribati - implement Annex 6 as required. | Kiribati | TBD | U |
| | Marshall Islands | Annex 6 requirement not implemented. | 26/8/05 | | Marshall Islands - implement Annex 6 as required. | Marshall Islands | TBD | U |
| | Micronesia | Annex 6 requirement not implemented. | 26/8/05 | | Micronesia - implement Annex 6 as required. | Micronesia | TBD | U |
| | Nauru | Annex 6 requirement not implemented. | 26/8/05 | | Nauru - implement Annex 6 as required. | Nauru | TBD | U |
| | Palau | Annex 6 requirement not implemented. | 26/8/05 | | Palau - implement Annex 6 as required. | Palau | TBD | U |
| | Papua New Guinea | Annex 6 requirement not implemented. | 26/8/05 | | Papua New Guinea - implement Annex 6 as required. | Papua New Guinea | TBD | U |
| | Solomon Islands | Annex 6 requirement not implemented. | 26/8/05 | | Solomon Islands - implement Annex 6 as required. | Solomon Islands | TBD | U |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| | Tonga | Annex 6 requirement not implemented. | 26/8/05 | | Tonga - implement Annex 6 as required. | Tonga | ~~TBD~~Tonga-advised ATM/AIS/SAR/SG/19 verbally that ACAS II implementation was completed. The Regional Office is waiting for a formal report. | U |
| | Vanuatu | Annex 6 requirement not implemented. | 26/8/05 | Pressure altitude reporting transponder required in all airspace since 1/1/00. | Vanuatu - implement Annex 6 as required. | Vanuatu | TBD | U |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| Carriage of Pressure Altitude Reporting Transponder | | | | | | | | |
| Requirement of Chapter 6 of Annex 6 | Bhutan | Annex 6 requirement not implemented. | 26/8/05 | | Bhutan - implement Annex 6 as required. | Bhutan | TBD | U |
| | Cook Islands | Annex 6 requirement not implemented. | 26/8/05 | | Cook Island - implement Annex 6 as required. | Cook Islands | TBD | U |
| | Kiribati | Annex 6 requirement not implemented. | 26/8/05 | | Kiribati - implement Annex 6 as required. | Kiribati | TBD | U |
| | Marshall Islands | Annex 6 requirement not implemented. | 26/8/05 | ACAS II required. | Marshall Islands - implement Annex 6 as required. | Marshall Islands | TBD | U |
| | Micronesia | Annex 6 requirement not implemented. | 26/8/05 | | Micronesia - implement Annex 6 as required. | Micronesia | TBD | U |
| | Nauru | Annex 6 requirement not implemented. | 26/8/05 | | Nauru - implement Annex 6 as required. | Nauru | TBD | U |
| | Palau | Annex 6 requirement not implemented. | 26/8/05 | | Palau - implement Annex 6 as required. | Palau | TBD | U |
| | Papua New Guinea | Annex 6 requirement not implemented. | 26/8/05 | | Papua New Guinea - implement Annex 6 as required. | Papua New Guinea | TBD | U |
| | Solomon Islands | Annex 6 requirement not implemented. | 26/8/05 | | Solomon Islands - implement Annex 6 as required. | Solomon Islands | TBD | U |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| | Tonga | Annex 6 requirement not implemented. | 26/8/05 | ACAS II required. | Tonga - implement Annex 6 as required. | Tonga | ~~TBD~~Tonga advised ATM/AIS/SAR/SG/19 verbally that the pressure altitude reporting transponder implementation was completed. The Regional Office is waiting for a formal report. | U |

**AIR NAVIGATION DEFICIENCIES IN THE ATM/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

| Identification | | Deficiencies | | | Corrective Action | | | |
|---|---|---|---|---|---|---|---|---|
| **Requirements** | **States/facilities** | **Description** | **Date first reported** | **Remarks** | **Description** | **Executing body** | **Target date for completion** | **Priority for action**** |
| Non Provision of Safety-related Data | | | | | | | | |
| Requirement of Paragraph 3.3.4.1 of Annex 11 | Bangladesh | Annex 11 requirement not implemented. | 11/9/09 | | Bangladesh - provide the safety-related data as required. | Bangladesh | | U |
| | Lao PDR | Annex 11 requirement not implemented. | 11/9/09 | | Lao PDR - provide the safety-related data as required. | Lao PDR | | U |
| | ~~Myanmar~~ | ~~Annex 11 requirement not implemented.~~ | ~~21/8/06~~ | | ~~Myanmar - provide the safety-related data as required.~~ | ~~Mayanmar~~ | ~~TBD~~completed | ~~U~~ |
| | Papua New Guinea | Annex 11 requirement not implemented. | 21/8/06 | | Papua New Guinea - provide the safety-related data as required. | Papua New Guinea | TBD | U |

# AGENDA ITEM 10: UPDATE THE ATM/AIS/SAR TASK LIST

**Agenda Item 10: Update the ATM/AIS/SAR Task List**

**ATM/AIS/SAR Task List**

10.1 Republic of Korea questioned the requirement for States to develop their individual contingency plans when the item on the task list was *regional* contingency planning. The Secretariat explained that contingency planning was a State responsibility as was the coordination with neighbouring States which could only be done on a bilateral basis. Hong Kong, China said that ICAO facilitation may very well be needed where a number of States were involved. However the Secretariat explained that such assistance would require a detailed knowledge of all the different States ATM systems, airspace and route structures, knowledge that just did not reside within ICAO.

10.2 The meeting reviewed and updated the Task List, noting the alignment with the proposed regional performance objectives as described in Agenda Item 3. The meeting agreed that the Task List suitably reflected the work programme of the Sub-Group and formulated the following draft decision for consideration by APANPIRG:

**Draft Decision SG19/17 – ATM/AIS/SAR Task List**

That, the ATM/AIS/SAR Sub-Group Task List and attachments contained in **Appendix A** to the ATM/AIS/SAR/SG/19 Report on Agenda Item 10 be adopted as the current work programme for the ATM/AIS/SAR Sub-Group of APANPIRG.

# ATM/AIS/SAR Sub Group of APANPIRG — TASK LIST

The priorities assigned in the list have the following connotation:

A = Tasks of a high priority on which work should be expedited; and
B = Tasks of a medium priority on which work should be undertaken as soon as possible but not to the detriment of Priority "A" tasks.

***(last updated 26 June, 2009)***

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/1**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI- 8 Collaborative airspace design and management | **<u>ATS Routes</u>**<br><br>a) Identify ATS route requirements and monitor progress of route implementation in APAC Region<br><br>b) Coordinate implementation of new ATS routes in accordance with the requirements of both States and airspace users<br><br>c) Maintain Asia/Pacific ATS Route Catalogue on ICAO Regional Office website | ONGOING | States, Airspace Users, Regional Office<br><br>**Functional Responsibility:**<br>TRASAS<br>CMRI<br>BBACG<br>FIT-BOB<br>BOB-RHS/TF<br>SEACG<br>FIT-SEA<br>SEA RR/TF<br><br>ISPACG & FIT<br>IPACG & FIT<br>ASIOACG | OPEN | ATS Routes included as standing agenda item on ATS Coordination Group agendas |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/2**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI-8 Collaborative airspace design and management | **ATS route implementation based on PBN Concepts**<br><br>*South East Asia*<br>Conduct ATS route implementations in collaboration with stakeholders based on the Regional PBN Implementation Plan agreed by APANPIRG, to improve en-route airspace efficiency by means of reduced horizontal separation (lateral and longitudinal) based on PBN provisions. | 2010 | States of South East Asia,<br>Regional Office<br><br>**Functional Responsibility:**<br>SEACG,<br>FIT-SEA,<br>SEA RR/TF | OPEN | ATM/AIS/SAR/SG/19 established the SEA Route Review Task Force (SEA RR/TF) |
| **18/3**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI-8 Collaborative airspace design and management | **ATS route implementation based on PBN Concepts**<br><br>*Bay of Bengal*<br>Conduct ATS route implementations in collaboration with stakeholders based on the Regional PBN Implementation Plan agreed by APANPIRG, to improve en-route airspace efficiency by means of reduced horizontal separation (lateral and longitudinal) based on PBN provisions. | 2010 | States of Bay of Bengal,<br>Regional Office<br><br>**Functional Responsibility:**<br>BBACG,<br>FIT-BOB,<br>BOB-RHS/TF | OPEN | BBACG/20 adopted 2010 as target for 50 NM longitudinal, established the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF) |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/4**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI-8 Collaborative airspace design and management | **ATS route implementation based on PBN Concepts**<br><br>*Pacific Area (including North Pacific)*<br>Conduct ATS route implementations in collaboration with stakeholders based on the Regional PBN Implementation Plan agreed by APANPIRG, to improve en-route airspace efficiency by means of reduced horizontal separation (lateral and longitudinal) based on PBN provisions. | 2010 | States of North Pacific, Central and South Pacific, respectively, Regional Office<br><br>**Functional Responsibility:** No ICAO working group established, informal groups doing this work, notably ISPACG, IPACG | OPEN | 50 NM longitudinal implemented North Pacific in 2008<br><br>30/30 NM (RNP4) implemented Honiara, Nauru, Brisbane, Nadia Auckland Oceanic FIRs in January 2005<br><br>30/30 NM operational trials commenced Oakland FIR 2007, Fukuoka FIR from August 2008, Anchorage FIR estimate 2011 |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/5**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI-8 Collaborative airspace design and management<br><br>GPI-10 Terminal area design and management,<br><br>GPI-11 RNP and RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs)<br><br>GPI-12 Flight Management System (FMS) – based arrival procedures | **Terminal Area implementation based on PBN Concept**<br><br>Implement ICAO Performance Based Navigation (PBN) provisions for terminal area operations in collaboration with stakeholders based on the Regional PBN Implementation Plan agreed by APANPIRG, to improve terminal area efficiency by use of advanced navigation specifications for SIDs, STARs and instrument approach procedures. | In accordance with Regional & State PBN Plans for 2008-2012 and 2013-2016 | States, Users, Regional Office<br><br>**Functional Responsibility:** PBN/TF | OPEN | |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/5**<br><br>**Priority A** | GPI-6<br>Air traffic flow management<br><br>GPI-8<br>Collaborative airspace design and development<br><br>GPI-16<br>Decision support and alerting system | **<u>Implement Air Traffic Flow Management</u>**<br><br>States to consider and implement aspects of air traffic flow management (ATFM) including:<br>a) centralized ATFM<br>b) inter-regional cooperative ATFM;<br>c) establishment of ATFM databases;<br>d) application of strategic ATFM planning;<br>e) application of tactical ATFM planning; and<br>f) assessment of economic and environmental impact of the implementation of the ATFM system. | 2012 | States, Users, Regional Office ATM/AIS/SAR/SG APANPIRG<br><br>**Functional Responsibility:** ATFM/TF for Bay of Bengal, no other working group established | OPEN | Bay of Bengal ATFM/TF active since 2005<br><br>Bay of Bengal implemented BOBCAT 5 July 2007<br><br>ATM/AIS/SAR/SG/19 drafted Conclusion to establish regional ATFM steering group |
| **18/7**<br><br>**Priority A** | GPI-2<br>Reduced vertical separation minima | **<u>RVSM Implementation</u>**<br><br>a) Plan for and facilitate implementation of RVSM, as appropriate, in the Asia/Pacific Region | 2009 - 2012 | Affected States, Regional Office<br><br>**Functional Responsibility:** RVSM/TF dissolved in December 2008 following China implementation, no ICAO group required for few remaining APAC FIRs | OPEN<br><br>OPEN | China sovereign airspace implementation 21 November 2007. Pyongyang FIR scheduled October 2009. Ulaanbaatar tentatively 2012 in coordination with the Russian Federation. |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/8**<br><br>**Priority A** | None applicable | **Identify and manage Deficiencies in the ATM, AIS and SAR fields**<br><br>a) Develop and maintain Deficiencies list,<br><br>b) Identify unimplemented items in the BANP,<br><br>c) Assist States to correct deficiencies,<br><br>d) Promote timely resolution of safety-critical items identified by APANPIRG | ONGOING | States, Users, International Organisations, Regional Office, ATM/AIS/SAR/SG APANPIRG<br><br>**Functional Responsibility:** No specific working group established, all parties have responsibilities in this area. | OPEN | ALLPIRG/5 (March 2006) raised Conclusion 5/15 in respect of "Last Resort" action to resolve deficiencies |
| **18/10**<br><br>**Priority A** | None applicable | **ATM Contingency Planning**<br><br>Prepare ATM Contingency Plans based on model (Indonesia) adopted by APANPIRG/17. Coordinate with neighbouring States to prepare plans | 2010 | States, Regional Office,<br><br>**Functional Responsibility:** No working group established, work item included on agenda of ATS Coordination Groups. | OPEN | Send copies of ATM Contingency Plans to Regional Office |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/6**<br><br>**Priority B** | GPI-18 Aeronautical information | **Implement AIS enhancements**<br><br>a) Develop AIS implementations plans for introduction of AIS quality systems and AIS databases and consider issues arising from the use of public internet for AIS;<br><br>b) Study means of aeronautical data management by civil aviation authorities and/or ATS providers in other regions including the aeronautical information exchange model (AIXM) and the electronic AIP (eAIP), and consider the feasibility in making use of these methods/models in the Asia/Pacific Region;<br><br>c) Develop Regional AIS Automation Plan, training material and conduct workshops on the Guidance Manual for AIS in the Asia/Pacific Region | 2012 | States, Users, Regional Office<br><br>**Functional Responsibility:** AAITF | OPEN | AIS/AIM Implementation Task Force (AAITF) active since March 2006 |
| **18/9**<br><br>**Priority B** | None applicable | **SAR Matters**<br><br>Assist appropriate provision of SAR facilities, services and procedures within the Asia Pacific Region by:<br><br>a) Periodic review of SAR facilities, services and procedures in the region,<br>b) Encourage States to delegate or negotiate SAR services,<br>c) Asia/Pacific "SAR Capability Matrix" be kept up to date and distributed to States for information and action.,<br>d) Asia/Pacific "Register of SAR Agreements" be kept up to date and distributed to States for information and action | ONGOING | States, Regional Office, ATM/AIS/SAR/SG APANPIRG | OPEN | States to update the ATM/AIS/SAR/SG each year to permit the periodic update of the SAR Capability Matrix and Register of SAR Agreements. |

| ACTION ITEM & PRIORITY | GLOBAL PLAN INITIATIVE | DESCRIPTION | TARGET DATE | RESPONSIBLE PARTY | STATUS | REMARKS |
|---|---|---|---|---|---|---|
| **18/11**<br><br>**Priority B** | As appropriate | **<u>APANPIRG Key Priorities</u>**<br><br>Regularly review APANPIRG List of Key Priorities for implementation of CNS/ATM systems for the Asia/Pacific region, identify new items as required, encourage and monitor implementation | ONGOING | States, Regional Office, Airspace Users, International Organisations ATM/AIS/SAR/SG | OPEN | ATM/AIS/SAR/SG/19 recommended that the key priority items be included in Performance e Framework Forms (PFFs) and the Key Priorities List be discontinued. |
| **18/14**<br><br>**Priority A** | GPI-5 Performance based navigation<br><br>GPI-9 Situational awareness<br><br>GPI-11 RNP and RNAV SIDs and STARs<br><br>GPI-17 Implementation of data link applications | **<u>Amendments to ICAO Flight Plan</u>**<br><br>Review Amendment 1 to the Fifteenth Edition of the PANS ATM (Doc 4444, effective 15 November 2012) to identify implementation complexities and consequent regional implementation plans and strategies arising from the adoption of amended PANS ATM provisions relating to the ICAO Flight Plan and associated ATS Message formats. | 2010 | States, Regional Office, Airspace Users, International Organisations ATM/AIS/SAR/SG<br><br>**Functional Responsibility:** FPL&AM/TF | OPEN | FPL&AM TF/1 drafted the *Interim Strategy for the Implementation of New ICAO Flight Plan Format and supporting ATS Messages*<br><br>ATM/AIS/SAR/SG/19 recommended that APANPIRG adopt the Interim Strategy |

**……..**

# AGENDA ITEM 11: ANY OTHER BUSINESS

**Agenda Item 11: Any other business**

**ANSPs Partnership against the spread of influenza and other dangerous communicable diseases**

11.1 The United States presented information describing three objectives regarding the spread of influenza and other dangerous communicable diseases. Firstly, there is a need for robust, cooperative protocols to enable coordinated operational responses to any in-flight identification of persons suspected of being infected with a communicable disease of significant public health concern. Secondly, pre-planned arrangements between adjoining or adjacent States are essential, possibly modeled on the cooperation amongst the United States, Canada, and Mexico which has established a trilateral arrangement for addressing potential in-flight cases. Finally, through ICAO forums such as APANPIRG and its Sub-Groups and other venues; the FAA and other CAAs/ANSPs can work with counterparts in their respective countries from public health authorities, customs agencies, airport authorities, and air operators to strengthen cooperation.

11.2 Domestic and multilateral cooperative arrangements, which draw on multi-disciplinary capabilities, will enhance the effectiveness of collective efforts to slow, limit, and prevent the spread through air travel of communicable diseases of public health concern.

## AGENDA ITEM 12: DATE AND VENUE FOR NEXT MEETING

**Agenda Item 12: Date and venue for next meeting**

12.1 The meeting agreed that the next ATM/AIS/SAR Sub-Group meeting would be held over 5 working days from 21 – 25 June, 2010 at the Regional Office premises. The Regional Office would make appropriate arrangements and advise parties accordingly.

**Closing remarks**

12.2 In closing the meeting, the Chairman recalled that, amongst other things, there had been very keen exchanges of ideas on the strategy to prepare ourselves for transition to the new ICAO flight plan format; the ways to apply the ICAO performance-based approach to air navigation planning and implementation, and how to fulfill airspace safety assessment requirements and user expectations for PBN implementation. The Sub-Group had established a route review task force to advance route related matters in the South China Sea and a variety of draft Conclusions and Decisions were formulated for consideration by the APANPIRG.

12.3 The Chairman again touched upon the difficult times faced by the aviation industry, noting that the way forward is very challenging indeed. However, he recalled the old Chinese saying – "When the path ahead appears to be leading to a dead-end, somehow there will be a way out of the impasse." The Chairman was of the view that there was already some light at the end of the tunnel and there are small signs of the economic circumstances bottoming out. The meeting had been very fruitful with comprises reached in a number of contentious areas. The Chairman thanked all participants for their efforts during the week and urged all to continue with the work programmes agreed during the meeting. He wished everyone a safe journey home and looked forward to meeting again during future meetings.

— END —

# ATTACHMENTS TO THE REPORT

**List of Participants**

| | Name | Title/Organization | TEL/FAX/E-MAIL |
|---|---|---|---|
| 1. | **AUSTRALIA (2)** | | |
| | 1. Mr. Paul Reidy-Crofts | Standards Improvement Manager<br>Upper Airspace and Regional Services<br>ATC Operations Support<br>Airservices Australia<br>GPO Box 1093<br>Tullamarine, Victoria 3043<br>Australia | Tel: +61-3 9235 7424<br>Mobile:+61-418383772<br>Fax: +61-3-9235 7595<br>E-mail:<br>paul.reidy-crofts@airservicesaustralia.com |
| 2. | **BANGLADESH (2)** | | |
| | 2. Mr. S.M. Wahidur Rahman | Assistant Director (Flight Safety & Regulation)<br>Civil Aviation Authority of Bangladesh<br>Headquarters Office<br>Kurmitola<br>Dhaka 1229<br>Bangladesh | Tel: +880 (2) 891 1126<br>+880 01913901399<br>Fax: +880 (2) 891 4469<br>E-mail: dfsrcaab@accesstel.net<br>ais_caab@accesstel.net |
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| 3. | **BRUNEI DARUSSALAM (3)** | | |
| | 4. Mr. Koh Han Kok | Air Traffic Control Officer<br>Department of Civil Aviation<br>Brunei International Airport<br>Bandar Seri Begawan BB2513<br>Brunei Darussalam | Tel: +673 (2) 331157<br>+673 8665038<br>Fax: +673 (2) 331157<br>E-mail: hankokkoh@hotmail.com |

| | Name | | Title/Organization | TEL/FAX/E-MAIL |
|---|---|---|---|---|
| | 5. | Mr. Hj. Jolkipli Duraman | Air Traffic Control Officer<br>Department of Civil Aviation<br>Brunei International Airport<br>Bandar Seri Begawan BB2513<br>Brunei Darussalam | Tel: +673 (2) 331157<br>Fax: +673 (2) 331157<br>E-mail: dzul77@hotmail.com |
| | 6. | Mr. Yasin Apong | Briefing Officer<br>Department of Civil Aviation<br>Brunei International Airport<br>Bandar Seri Begawan BB2513<br>Brunei Darussalam | Tel: +673 (2) 331157<br>Fax: +673 (2) 331157<br>E-mail: bo.ais.brunei@civil-aviation.gov.bn |
| 4. | **CAMBODIA (2)** | | | |
| | 7. | Mr. Chhun Sivorn | Deputy Director Flight Operation and Air Safety Department<br>State Secretariat of Civil Aviation<br>No. 62 Preah Norodom Blvd.<br>Phnom Penh<br>Cambodia | Tel: +855 23 224258<br>Fax: +855 23 224259<br>E-mail: chhunsivorn@yahoo.com |
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## LIST OF WORKING AND INFORMATION PAPERS

### WORKING PAPERS

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| 1 | 1 | Provisional Agenda | Secretariat |
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| 3 | 3 | Identification of Regional Performance Objectives | Secretariat |
| 4 | 3 | Performance-Based Approach and Measurement | Secretariat |
| 5 | 4 | Comparison of IATA ATM User Expectations 2008-2015 with the Regional Work Programme | Secretariat |
| 6 | 4 | Review of the 34th Meeting of the RVSM Implementation Task Force | Secretariat |
| 7 | 2 | Review and Update Conclusions and Decisions of APANPIRG | Secretariat |
| 8 | 3,10 | ATM/AIS/SAR Task List | Secretariat |
| 9 | 7 | Regional RVSM and Horizontal Safety Performance | Secretariat |
| 10 | 7 | Report on Activities of the RASMAG | Secretariat |
| 11 | 4 | Search and Rescue Matters | Secretariat |
| 12 | 9 | List of Air Navigation Deficiencies in the ATM/AIS/SAR Fields | Secretariat |
| 13 | 5 | Outcomes of the 45th DGCA Conference | Secretariat |
| 14 | 8 | Review of Interim Edition of Regional PBN Implementation Plan by the Fourth Meeting of the PBN Task Force | Secretariat |
| 15 | 5 | Outcomes of ATFM Seminar/Workshop | Secretariat |
| 16 | 4 | First Meeting of ICAO Flight Plan and ATS Messages Implementation Task Force | Secretariat |
| 17 | 4 | Global Operational Data Link Document (GOLD) Update | Secretariat |
| 18 | 2 | APANPIRG List of Key Priorities | Secretariat |
| 19 | 4 | AIS Update from the First Meeting of ICAO AIS-AIM Study Group and the Fourth Meeting of Asia/Pacific AIS-AIM Implementation Task Force | Secretariat |
| 20 | 7 | Outcomes from RASMAG/10 PBN Safety Assessment and Monitoring Requirements | Hong Kong, China |
| 21 | 4 | Outcomes of AIS Automation/Electronic Terrain and Obstacle Data Seminar/Workshop | Secretariat |
| 22 | 6 | Summary Report of the Twentieth Meeting of the Bay of Bengal ATS Coordination Meeting (BBACG/20) | Secretariat |

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| 24 | 6 | Review of the outcomes of the Sixteenth Meeting of South-East Asia ATS Co-ordination Group (SEACG/16) | Secretariat |
| 25 | 4 | The Sixth Meeting of the Western Pacific/South China Sea RVSM Scrutiny Group | Secretariat |
| 26 | 5 | Study of Application of AIRAC Date/Time in Asia Pacific Region | Australia on behalf of AIS-AIM Implementation Task Force |
| 27 | 5 | Traffic Movements and GNE Reports June 2008 to May 2009 on the Six Designated Monitored Areas in the South China Sea | Singapore |
| 28 | 6 | Summary of the Fourth Meeting of South-East Asia Required Navigation Performance Implementation Task Force (RNP-SEA/TF/4) | Secretariat |
| 29 | 5 | Approval of ANP Amendment APAC 09/5-ATS | Secretariat |
| 30 | 8 | Establishment of Radar Service in Upper Sectors Ujung Pandang | Indonesia |
| 31 | 6 | Summary Report of The Ninth Meeting of FANS Implementation Team, South-East Asia (FIT-SEA/9) | Secretariat |
| 32 | 5 | Bay of Bengal ATFM Update – BOBCAT Activities | Thailand |
| 33 | 5 | Lessons Learned Regarding Termination of Satellite Detection Of 121.5 Mhz Signals From Distress Beacons | United States |
| 34 | 5 | Develop Global Oceanic and Remote Interface Control Document (ICD) | United States |
| 35 | 5 | Global Operational Data Link Document (GOLD) Update and Action | United States |
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| 37 | 8 | Status of the Development and Implementation ADS-C In-Trail Procedures | United States |
| 38 | 8 | ICAO SARPS Amendment for additional Notice to Airman (NOTAM) Field for Cross-Reference of Digital Aeronautical Information and Legacy text NOTAM | United States |
| 39 | 5 | Proposal to create an ICAO South East Asia/ North East Asia ATM Focus Group | IATA |

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| 41 | 5 | SSR Code Allocation – EUR & MID Regions | Secretariat |
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| 3 | 6 | 29th and 30th Meeting of the Informal Pacific Air Traffic Control (ATC) Coordinating Group (IPACG/29 & IPACG/30) | United States & Japan |
| 4 | 6 | 23rd Meeting of the Informal South Pacific ATS Coordinating Group (ISPACG/23) | United States |
| 5 | 5 | Third Inter-Regional Meeting between APAC, ESAF, EUR/NAT and MID Regional Offices (IRCM/3) | Secretariat |
| 6 | 4 | Asia Pacific Runway Safety Programme Seminar | Secretariat |
| 7 | 4 | IFALPA Runway Safety Manual | IFALPA |
| 8 | 4 | Asia/Pacific FANS Data Link Events | Secretariat |
| 9 | 5 | TRASAS Update | Secretariat |
| 10 | 8 | RNAV5 Preferential Operation | Japan |
| 11 | 8 | User Preferred Route (UPR) Implementation | United States & Japan |
| 12 | 8 | Continuous Descent Arrivals (CDA) | Japan |
| 13 | 8 | Activities toward AIM in Japan | Japan |
| 14 | 8 | Update on Activities of the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) | United States |
| 15 | 8 | Update n Activities Of The Asia And South Pacific Initiative To Reduce Emissions (Aspire) | United States |
| 16 | 6 | Outcomes from the Seventh Cross Polar Working Group Meeting (CPWG/7) | United States |
| 17 | 8 | Multiple Series Implementation for NOTAMs in the Aeronautical Information Management Digital NOTAM Program | United States |
| 18 | 5 | ICAO Flight Plan and ATS Message Implementation | United States |

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| 20 | 5 | Satellite Data Communications Performance in Oceanic and Remote Regions | United States |
| 21 | 8 | AIS Automation/eTOD Seminar and AAITF/4 | United States |
| 22 | 8 | Report of the CAR/SAM Air Traffic Flow Management (ATFM) Regional Project for Latin America (RLA/06/091) | United States |
| 23 | 8 | Outcome of Eighth Meeting of Automatic Dependent Surveillance-Broadcast (ADS-B) Study and Implementation Task Force | Secretariat |

**FLIMSY**

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| 2 | 5 | AIDC Matters | Secretariat |

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