

INTERNATIONAL CIVIL AVIATION ORGANIZATION  
ASIA AND PACIFIC OFFICE



REPORT OF THE EIGHTH MEETING OF THE  
APANPIRG CNS/ATM IMPLEMENTATION CO-ORDINATION SUB-GROUP  
(CNS/ATM/IC/SG/8)

Bangkok, Thailand, 30 July to 3 August 2001

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

Approved by the Meeting  
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## **PART I – HISTORY OF THE MEETING**

### **1. Introduction**

1.1 The eighth meeting of the APANPIRG Communications, Navigation, Surveillance and Air Traffic Management, Implementation Co-ordination Sub-Group (CNS/ATM/IC/SG/8) was held at the ICAO Asia and Pacific Regional Office in Bangkok, Thailand from 30 July to 3 August 2001.

### **2. Attendance**

2.1 The meeting was attended by 52 participants from 18 States and 2 International Organizations. A list of participants is provided at Attachment 1.

### **3. Officers and Secretariat**

3.1 Mr. Rodney Bracefield, Manager, CNS/ATM of Civil Aviation Authority of New Zealand acted as Chairperson and presided over the meeting throughout its duration.

3.2 Mr. John E. Richardson, Regional Officer ATM, and Mr. K.P. Rimal, Regional Officer CNS, ICAO Asia and Pacific Office were the Secretariat for the meeting. They were assisted by Regional Officers ATM Messrs. David J. Moores and Hiroshi Inoguchi and Regional Officer CNS Mr. Li Peng.

### **4. Language and Documentation**

4.1 The discussions were conducted in English. Documentation was issued in English with a total of 14 Working Papers and 18 Information Papers being considered by the meeting. A list of papers presented during the meeting is included in Attachment 2 to this report.

### **5. Opening of the Meeting**

5.1 The meeting was opened by Mr. Rodney Bracefield, who welcomed the participants to Bangkok and outlined the work programme before the Sub-Group.

### **6. Draft Conclusions, Draft Decisions and Decisions of the CNS/ATM/IC Sub-Group - Definitions**

6.1 The CNS/ATM/IC Sub-Group records its actions in the form of Draft Conclusions and Draft Decisions with the following significance:

- 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 Secretariat according to established procedures; and

- 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; and
- c) **Decisions** of CNS/ATM/IC Sub-Group relate solely to matters dealing with the internal working arrangements of the CNS/ATM/IC Sub-Group.

## 6.2

### **List of Draft Conclusions**

- Draft Conclusion 8/1 – Short term funding of the RVSM and CRA system performance monitoring programmes in the Asia/Pacific Region
- Draft Conclusion 8/2 – Establishment of a system performance monitoring agency for implementation of RVSM in the Asia Region
- Draft Conclusion 8/3 – Establishment of a long-term system performance monitoring organization for the Asia/Pacific Region
- Draft Conclusion 8/5 – Business Case Studies – Partnership Approach

## 6.3

### **List of Draft Decisions**

- Draft Decision 8/4 – Amendment of the Key Priorities for CNS/ATM Implementation
- Draft Decision 8/6 – Amendment to the Terms of Reference of the CNS/ATM/IC/SG

## **PART II – REPORT ON AGENDA ITEMS**

### **Agenda Item 1: Adoption of Provisional Agenda**

1.1 The meeting reviewed the following provisional Agenda presented by the Secretariat and adopted it as the Agenda for the meeting.

- Agenda Item 1: Adoption of Provisional Agenda
- Agenda Item 2: Review of APANPIRG/11 and subsequent ANC/Council's decisions and Sub-Group Chairperson's reports
- Agenda Item 3: Review of recent developments, research, trials and demonstrations associated with the implementation of CNS/ATM systems and global/regional plans
- Agenda Item 4: Review of CNS/ATM implementation priorities for the Asia/Pacific Region
- Agenda Item 5: Identify the need for and facilitate the development of business cases, including cost/benefit analyses, for the implementation of CNS/ATM systems within the Region
- Agenda Item 6: Review requirements for Inter Regional Co-ordination
- Agenda Item 7: Develop and identify CNS/ATM requirements, including basic operational requirements and planning criteria, for incorporation in the Asia/Pacific Regional Basic Air Navigation Plan (ANP) and Facilities and Services Implementation Document (FASID).
- Agenda Item 8: Review and update the Asia/Pacific Regional Plan for the New CNS/ATM Systems
- Agenda Item 9: Identify Shortcomings and Deficiencies in the Air Navigation Field
- Agenda Item 10: Develop and propose to APANPIRG an appropriate future work programme
- Agenda Item 11: Any other business
- Agenda Item 12: Propose date and venue of the next meeting



**Agenda Item 2: Review of APANPIRG/11 and subsequent ANC/Council's decisions and Sub-Group Chairperson's reports**

**2.1 Report of the ATS/AIS/SAR/SG/11**

2.1.1 The eleventh meeting of the ATS/AIS/SAR Sub-Group was held in Bangkok, Thailand from 25-29 June 2001. The meeting was attended by 72 participants from 21 States, 2 International Organizations and 1 aviation organization.

2.1.2 The Secretariat, on behalf of the Chairperson of the Sub-Group, briefed the meeting regarding CNS/ATM related issues discussed by the eleventh meeting of the Sub-Group.

2.1.3 With regards to the implementation of RVSM in the Pacific region, the Sub-Group noted that Fiji, Japan, New Zealand and the United States had all extended the implementation of RVSM from FL390 to FL410 during the past 12 months. Australia, who has also extended the RVSM to FL410 in oceanic airspace, will apply RVSM from FL290 to FL410 over continental Australian airspace later this year.

2.1.4 The Sub-Group noted that the RVSM/TF endorsed the long-term requirement for collection and analysis of information related to instances of large height deviations arising from turbulence, incorrect application of aircraft contingency procedures, response to airborne collision avoidance system alerts and errors in granting or following ATC clearances.

2.1.5 The Sub-Group was advised that the RVSM/TF agreed to establish an ad-hoc working group on development of a policy for long-term monitoring of aircraft height-keeping performance in the Asia/Pacific Region.

2.1.6 After a full review of all aspects of the implementation of RVSM in the airspace of the Pacific since 24 February 2000, the RVSM/TF considered it timely and appropriate to declare full operational capability.

2.1.7 The RVSM/TF/8, 9 and 11 focused on plans for implementation of RVSM in the Western Pacific/South China Sea, and began early preparation for implementation of RVSM on the major traffic flows in southeast Asia and from Asia to Europe south of the Himalayas.

2.1.8 All States concerned, except China and Hong Kong, China, agreed to the implementation of RVSM on 21 February 2002. China and Hong Kong, China informed the meeting that they would defer the implementation of RVSM in the Sanya AOR and Hong Kong FIR to 31 October 2002.

2.1.9 The ICAO MID Regional Office proposed that States of the western part of the Asia/Pacific Region that were not ready to implement RVSM on 21 February 2001, join with the MID Region to implement RVSM across regional boundaries on 27 November 2003. States concerned agreed to the proposal.

2.1.10 In regard to the implementation of ACAS II and pressure-altitude reporting transponders, the Sub-Group noted that the ICAO Council, upon reviewing the Report of APANPIRG/11, had noted the APANPIRG Conclusion 11/7 (Implementation of ACAS II), and in view of the slow progress of its implementation, requested the Secretary General to urge States to take action to mandate the carriage of ACAS II by the globally agreed date of 1 January 2003.

2.1.11 The Sub-Group noted that following their review in June 2000 of the global

implementation of WGS-84, the ANC called upon States and PIRGs to adopt a standard format, similar to the one adopted by the CAR/SAM/3 RAN Meeting, as the standard format for reporting of detailed and up-to-date implementation of WGS-84. Considerable additional information was received from States during the meeting.

2.1.12 The Sub-Group reviewed the list of ATS routes which had not been implemented in accordance with the ASIA/PAC ANP. The list was updated.

2.1.13 In regard to SIGMET being included in the VOLMET broadcast, the Sub-Group referred the issue to the CNS/MET-SG for advice as to the format of the SIGMET, which on many occasions is too large to fit into the 5 minute timeframe allowed for the broadcast unless additional MET information is deleted. The Secretariat was later advised that under Annex 3, there were no provisions for abbreviating the SIGMET, however, further investigations will be taken to solve this problem.

2.1.14 The Sub-Group was advised of the work that had taken place by the EMARSSH Task Force in the revised ATS route structure, Asia to the Middle East and Europe, South of the Himalayas. Three Task Force meetings had taken place in 2001, two in the Asia/Pacific Region and one in the Middle East Region. All meetings had been successful in laying a foundation for the revised route structure including associated requirements to increase safety and operational efficiency. The target date for implementation is scheduled for 28 November 2002, however, the Sub-Group was advised that the section of the project between Australasia and South East Asia was scheduled for completion by the end of 2001. Issues that were discussed included:

- a) safety assessment in areas where RNP10 would be used;
- b) exclusive/non-exclusive RNP airspace;
- c) establishment of an Aircraft Navigational Error monitoring program;
- d) appointment of a Central Monitoring Agency (CMA);
- e) publication of Aeronautical Information Circular (AIC) and other documentation;
- f) contingency procedures which should be considered, include:
  - i) weather deviations
  - ii) navigational errors
  - iii) environmental factors (e.g. volcanic activity)
- g) training considerations;
- h) military considerations;
- i) HF congestion; and
- j) RVSM

2.1.15 It was noted by the Sub-Group that a methodology for a dynamic transition from the old route structure to the revised route structure was also considered. Other examples where similar transition planning has been undertaken, include the South China Sea restructure, and the Y2K transition procedure, would be looked at to come up with an acceptable and workable transition plan. Industry/airline advice and guidance should also be sought.

2.1.16 The meeting recalled that the EMARSSH project is an initiative of the participating States and international organizations and has been recognized by ICAO as a significant development

that facilitates inter-regional co-operation to improve the ATS route structure from Asia to the Middle East and Europe. The project has been designed to ensure the provision of safe uniform procedures on an inter-regional basis. It is acknowledged by all concerned that the full implementation of the proposed route system will result in benefits in terms of safety, efficiency and capacity enhancements that meet the objectives envisaged in the ICAO Global Air Navigation Plan for CNS/ATM Systems. To achieve the objective of the project, all concerned should be fully committed to early completion by the implementation date of 28 November 2002.

2.1.17 The Sub-Group reviewed the work done by several meetings of South China Sea Route Structure Implementation Task Force (SCS TF) since agreement was finalized by States concerned in December 2000. The increased air route capacity provided by the improved ATS route structure would result in greater flexibility in airline scheduling and operations, and would reduce airspace congestion and flight delays. The Hong Kong area of responsibility (AOR), in place since 1975, would be suspended and a new Sanya AOR would be declared. An implementation date of 1 November, 2001 was agreed to by all States concerned. Reviewing the planned revised ATS route structure to be implemented, the SCS/TF recognized a need of certain adjustment to the route structure, taking into account city-pair routings, existence of other ATS routes, relocation of reporting points, etc. It was also agreed that any non-essential changes would be considered at future meetings when the Task Force reviewed operations after the revised route structure had been implemented.

2.1.18 The meeting was advised that Lao DCA is actively pursuing a plan to upgrade Vientiane FIC to Vientiane ACC for the purpose of providing Area Control Service within the Vientiane FIR from the 1 November 2001 (except a portion on ATS routes A1, B202 and B329, where the ATC services were provided by Bangkok ACC on a temporary basis).

2.1.19 The Sub-Group reviewed the progress of AIS Automation Task Force (AATF) AATF/7, and considered a number of important issues and tasks at their meeting in Brisbane, including:

- (a) problems in the development of automated AIS system in Thailand;
- (b) automation survey;
- (c) Guidance Material on the Common Operating Procedures for the Asia/Pacific Automated AIS Systems;
- (d) use of XML;
- (e) draft Guidance Material for a Quality System;
- (f) draft Quality Manual;
- (g) draft Interim Training Guidelines;
- (h) structure of guidance material;
- (i) draft for inclusion in the FASID;
- (j) NOTAM checks to be sent as NOTAM; and
- (k) work of the AIS/MAP Study Group.

2.1.20 The Sub-Group reviewed the list of Shortcomings and Deficiencies in the ATS/AIS/SAR field and updated it for presentation to APANPIRG/12.

2.1.21 The Sub-Group reviewed the Subject/Tasks List provided by APANPIRG/11 and in the context of actions carried out at the meeting, the list was updated for presentation to APANPIRG/12.

## 2.2 Report of the CNS/MET SG/5

2.2.1 It was noted that the Fifth Meeting of the CNS/MET Sub-Group was held in Bangkok from 16 to 20 July 2001. The meeting was attended by 80 experts from 18 States, IATA, IFALPA, Galileo and SITA.

2.2.2 The meeting developed 23 draft Conclusions, 3 draft Decisions for consideration by APANPIRG/12 and formulated 4 Decisions to carry out various other tasks of the Sub-Group. The meeting noted all the draft Conclusions and Decisions that were of direct interest to the CNS/ATM/IC Sub-Group.

2.2.3 It was noted that of the 37 tasks, actions on 26 Tasks were completed and a new task relating to the development of Chapter 8 "Meteorology" for inclusion in the ASIA/PAC Regional Plan for the new CNS/ATM System was added.

2.2.4 It was noted that the task relating to the development of ground-to-ground ATN Transition Plan was completed. Four Regional Planning Documents were also developed to facilitate implementation of ATS Message Handling System (AMHS), Addressing and Naming Plans, NSAP Address Registration Form and Routing Architecture. Development of additional ATN documents including ICDs for router, AMHS and AIDC will be completed by 2005. It is expected that an intra-regional ATN backbone network will be completed by 2005.

2.2.5 It was also noted that Strategies for Precision Approach and Landing System and Implementation of GNSS Navigation Capability in the ASIA/PAC region were reviewed and updated. A checklist was developed to assist States in the implementation of GNSS. A working group was established to develop proposal to include CNS/ATM related material in the Regional Procedures contained in the CNS part of ASIA/PAC Basic ANP and FASID. Proposals for amendment to the Regional Procedures contained in MET part of the Basic ANP and FASID and MET Tables were developed.

2.2.6 It was noted that ASIA/PAC WAFS Transition Plan is being implemented. The RAFCs ceased their operation upon completion of transfer of their responsibilities to WAFCs London and Washington. Requirement for a new WAFS area of coverage "M" was developed with a proposal to amend ASIA/PAC ANP.

2.2.7 The ASIA/PAC SADIS strategic assessment table was developed to assist planning the future SADIS bandwidth requirements. "Chapter 8 – Meteorology" was developed for inclusion in the ASIA/PAC Regional Plan for the new CNS/ATM system. A MET/ATM Task Force was established to further develop Chapter 8 – Meteorology of the Regional Plan.

## 2.3 Action on Conclusions/Decisions of APANPIRG/11

2.3.1 The APANPIRG/11 Meeting, which was held in Bangkok, Thailand, 2 – 6 October 2000, took action on the Conclusions and Decisions formulated by the CNS/ATM/IC/SG/7 Meeting held in Singapore, 21 September – 25 August 2000.

2.3.2 Actions taken by ANC and the Council including States and the Secretariat on the Conclusions and Decisions of APANPIRG/11 Meeting are at **Appendix A**.

**ACTION TAKEN ON CONCLUSIONS/DECISIONS OF CNS/ATM/IC SUB-GROUP**

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 11/10	<p><b>Conclusion 11/10 - Development of a Revised ATS route structure - Asia to/from Europe/Middle East, South of the Himalayas</b></p> <p>That, taking into account the introduction of Required Navigation Performance (RNP), Area Navigation (RNAV) and Reduced Vertical Separation (RVSM) into the Asia Pacific region, States, ICAO and IATA develop a revised ATS route structure - Asia to/from Europe and the Middle East south of the Himalayas, to gain the benefits of existing aircraft capabilities together with CNS/ATM enhancements.</p>	<p>ANC</p> <p>Noted the conclusion and requested the Secretary General to organize an interregional co-ordination meeting to address interface issues to ensure end-to-end connectivity in the revised ATS route structure.</p>	<p>Inter-regional Co-ordination Meeting held in Bangkok in October 2000 between ICAOHQ, Paris, Cairo and Bangkok Offices.</p> <p>Framework and Terms of Reference developed and endorsed by ALLPIRG/4 in February 2001.</p>
	Paragraph 2.4.7	<p><b>Asia/Pacific area traffic forecasting</b></p> <p>The meeting also noted that the final report of the APA TFG will contain traffic forecasts for the top 25 city-pairs in each of the nine major traffic flows. It noted that the forecasts were based on scheduled traffic and that the APA TFG intended to obtain traffic movement information from major area control centres and that future forecasts could be based on actual traffic flow data instead of scheduled traffic information from the OAG.</p>	<p>Council</p> <p>Noted the forecasts developed for the nine major traffic flows across the Asia and Pacific Regions and requested the Secretary General to expedite the development of similar forecasts for international major traffic flows of other regions.</p>	<p>An APAC Traffic Forecasting Group Meeting was held in Bangkok in June 2001 to update the forecasts.</p>

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Appendix A to the Report on Agenda Item 2

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 11/35	<p><b>Conclusion 11/35 - Amendments to the Asia/Pacific Regional Plan for the New CNS/ATM Systems</b></p> <p>That,</p> <p>a) the amendments proposed to Chapters 5 &amp; 7 and to the CNS/ATM system transition tables of the Asia/Pacific Regional Plan for the New CNS/ATM Systems be adopted and incorporated in the plan; and</p> <p>b) ICAO issue a new edition of the Asia/Pacific Regional Plan for the New CNS/ATM Systems.</p>	<p>Council</p> <p>Noted the conclusion and requested the Secretary General to transfer this information to the facilities and services implementation document as and when the material contained in the Regional Plan for CNS/ATM Systems gained maturity.</p>	<p>Draft of new ANP and FASID sent to ICAOHQ in December 2000 for approval and processing.</p>
	C 11/37	<p><b>Conclusion 11/37 - CNS/ATM Implementation Planning Matrix</b></p> <p>That, the Secretariat be requested to develop and maintain a matrix listing all Asia/Pacific FIRs and the associated status of implementation of various major CNS/ATM elements.</p>	<p>ANC</p> <p>Noted the conclusion and requested the Secretary General to develop and maintain, within available budget allotments, a matrix listing all Asia/Pacific FIRs and the associated status of implementation of various major CNS/ATM elements.</p>	<p>A questionnaire has been sent to States to obtain information. The deadline for reply is 28 August 2001.</p>

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Appendix A to the Report on Agenda Item 2

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
Para 6.1	C 11/40	<p><b>Conclusion 11/40 - Business Case Study Special Implementation Project</b></p> <p>That, ICAO considers a proposal for an Asia Pacific Special Implementation Project (SIP) to be established with the primary objective of developing a business case study of various options in the implementation of air navigation facilities based on CNS/ATM.</p>	<p>Council</p> <p>Noted the conclusion and that such a project should take into consideration the ICAO guidance material on the development of business cases and that the SIP would be put forward to the Council for approval through established procedures.</p>	<p>An APAC SIP will be prepared for consideration by Council.</p>
	Paragraph 4.7	<p><b>Slow progress on the resolution of shortcomings and deficiencies</b></p> <p>The meeting discussed some of the possible reasons for the apparent slow progress on the resolution of these shortcomings and deficiencies. They were perceived as being lack of information, resources, non-prioritization and inadequate sensitization. In order to facilitate the process, it was recognized that follow-up actions with target dates have to be initiated including development of functional management tools (matrix/database) and discussions in forums such as ALLPIRG and Inter Regional Co-ordination Meetings.</p>	<p>ANC</p> <p>Noted the reasons for the apparent slow progress on the resolution of the shortcomings and deficiencies and called upon the Secretary General to develop appropriate management tools, at both the regional and global levels and a summary matrix to indicate the progress in addressing the issue.</p>	<p>A standardized matrix has been developed.</p>

**Agenda Item 3: Review of recent developments, research, trials and demonstrations, associated with the implementation of CNS/ATM systems and global/regional plans**

**3.1 Guidance Material on CNS/ATM Operations in the Asia/Pacific Region**

3.1.1 The meeting recalled that the CNS/ATM/IC/SG/7 Meeting (Singapore, 21 to 25 2000) agreed to revise the *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region* and Draft Conclusion 7/2 was presented to APANPIRG/11. Further, APANPIRG/11 (2 to 6 October 2000) reviewed the revised CNS/ATM/GM and concluded (Conclusion 11/4) that the guidance material be adopted and circulated to States and International Organizations. The Air Navigation Commission (2<sup>nd</sup> Meeting of 157<sup>th</sup> Session on 19 April 2001) on reviewing the report of APANPIRG/11, was of the view that the revised edition of the document should not include material on the application of separation based on ADS until proposed amendments to the *Procedures for Air Navigation Services – Rules of the Air and Air Traffic Services* (PANS-RAC, Doc 4444), which included ADS procedures for the provision of Air Traffic Control Services, had been approved by ICAO. Subsequently, the Council on 8 June 2001 noted the action taken by the Commission on this matter.

3.1.2 The ATS/AIS/SAR/SG/11 considered the ANC action and noted that several States in the Asia/Pacific Region were already using ADS in order to gain operational experience. Further, the ATS/AIS/SAR/11 was informed that such States were providing procedural separation in accordance with ICAO provisions, and that the use of ADS was solely for the purpose of gaining experience in the use of ADS.

3.1.3 The meeting was informed by the Secretariat that Chapter 6 of the guidance material, which contained guidance on the use of ADS to apply procedural separation, had been reviewed by the Secretariat at ICAO Headquarters. In light of the development of the proposed amendments to the PANS-RAC by the fifth meeting of Automatic Dependent Surveillance Panel (ADSP/5 November 1999) (renamed the Operational Data Link Panel) and the tenth meeting of the Review of the General Concept of Separation Panel (RGCSP/10, May 2000) (renamed the Separation and Airspace Safety Panel), a new Chapter XII on ADS services was included containing procedures and separation provisions. The Secretariat had considered that it was not appropriate for the material on separation to be included in regional guidance material in the manner in which it was worded. However, in the view of the Secretariat, guidance material on the application of ADS could be developed based on the PANS-RAC, if this was considered necessary by APANPIRG. In this regard, the proposed amendments to the PANS-RAC had been circulated to States and International Organizations by State letter and are expected to be reviewed by the Commission later this year and to be applicable in November 2002.

3.1.4 The meeting noted the information and agreed that the revised Guidance Material on CNS/ATM Operations in the Asia/Pacific Region be published in accordance with the guidance provided by the Air Navigation Commission, as soon as practicable.

3.1.5 Further, the meeting agreed that the guidance material should be reviewed after the amendment to the PANS-RAC was approved by ICAO, and any additional guidance material required for the application of the separation minima using ADS should be considered at that time.

### 3.2 **Traffic Forecasts for Major Traffic Flows**

3.2.1 The meeting recalled that a special meeting of the Asia/Pacific Area Traffic Forecasting Group (APA TFG) was held in May 2000 in response to the APANPIRG Conclusion 10/28. The main purpose of the special meeting was to develop traffic forecasts for the nine major traffic flows across the Asia/Pacific Region. Draft summary of forecast developed by the special meeting was provided to the CNS/ATM/IC/SG/7 and APANPIRG/11 meetings.

3.2.2 The meeting was also provided with extracts of summary forecasts in the Report of the APA TFG (Special Meeting) included as Tables 19 to 23 as shown at **Appendix A** to the Report on Agenda Item 3. The meeting agreed that these tables will be included in the Asia/Pacific Regional Plan for the New CNS/ATM Systems.

3.2.3 Furthermore, it was advised that APA TFG held its tenth meeting in Bangkok in June 2001 with the intention to review the forecasts developed at the special meeting in 2000. However, time did not permit a detailed review of the forecasts developed in 2001, but it was considered that they are within acceptable margins.

### 3.3 **World Radiocommunication Conference – 2003 (WRC-2003)**

3.3.1 The meeting noted the ICAO Position on specific agenda items of WRC-2003 that are of interest to civil aviation. The main issues highlighted were: the need for deletion of footnotes against some aeronautical radio navigation services (ARNS) allocations, to secure the band 5 091 - 5 150 MHz for ARNS including MLS, elimination of harmful interference on the aeronautical HF band, protection of DME and radar systems operating in the band 960 – 1 300 MHz and protection of radar systems in the band 2 700 – 2 900 MHz.

3.3.2 The meeting also noted that strong support to ICAO Position was expressed by the 37<sup>th</sup> DGCA Conference in its Action Item 37/12. It was also noted that a list of designated contact person in each civil aviation administration, responsible for preparation for WRC-2003, was being compiled by the Secretariat. Concerted efforts should be made to secure support for the ICAO Position at the regional level as well as at WRC-2003. It was also noted that a Workshop on Aeronautical Spectrum Management will be held in Bangkok from 15 to 16 November 2001 followed by the AMCP WG-F meeting. These events are expected to be attended by the States designated contact person.

3.3.3 The meeting noted the ICAO Position was presented at the Asia-Pacific Telecommunity (APT) Conference Preparatory Group Meetings for WRC-2003 held in September 2000 and June 2001. APT has planned to conduct three more meetings before WRC-2003 to finalize ASIA/PAC Position for WRC-2003.

3.3.4 The meeting noted the draft Conclusion 5/10 formulated by the CNS/MET/SG/5 meeting for consideration by APANPIRG/12.

### 3.4 **The Implementation status of CNS/ATM Systems**

3.4.1 The meeting was informed that in response to a survey conducted by the ICAO Regional Office in February and March 2001, States provided their CNS/ATM implementation status, which included ATN, CPDLC, ADS, AIDC and GNSS. The responses from States were compiled with a list and presented to the meeting. The list was further updated by India and Singapore and it is provided in the **Appendix B** to the report on Agenda Item 3.

### 3.5 **Strategies for Implementation of Landing Guidance and GNSS**

3.5.1 The meeting was informed that Regional Strategies for the provision of precision approach and landing guidance systems and implementation of GNSS navigation capability were reviewed and updated by the Fifth Meeting of CNS/MET Sub Group held in Bangkok from 16 to 20 July 2001. In order to have clearer understanding, it was suggested to add definitions of sole, primary and supplementary means in the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC Region

### 3.6 **ASIA/PAC Checklist for introduction of GNSS based operations**

3.6.1 The meeting was informed that the Fifth Meeting of CNS/MET Sub Group developed the checklist for introduction of GNSS based operations in Asia/Pacific region. The checklist is expected to provide necessary guidance to States in implementation of Regional Strategy for GNSS navigation capability and to serve as tool to facilitate implementation; ensuring compliance with relevant provision that are currently available. It was suggested that the TOR of GNSS Implementation Team as contained in the draft GNSS Manual should be appended to the checklist for detailed reference pending publication of the GNSS Manual. It was also suggested to add one more item on GNSS anomaly reporting to the list. The updated checklist by the meeting is provided in the **Appendix C** to this report.

### 3.7 **CNS/ATM Implementation Planning Matrix**

3.7.1 The meeting recalled that the Eleventh Meeting of ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/11) adopted Conclusion 11/37 – CNS/ATM Implementation Planning Matrix. The meeting was informed that the Regional Office issued a State Letter in June 2001 with a questionnaire to obtain necessary information. The questionnaire was prepared in consultation with IATA and States were requested to provide answers to the questions relevant to their facilities and services provided and planned. The questionnaire and a sample response from New Zealand were presented to the meeting.

3.7.2 A draft Form for CNS/ATM Implementation Planning Matrix prepared by Secretariat for tabulation of information was also presented to the meeting. It was agreed that responses received from States to the questionnaire and the Implementation status of CNS/ATM Systems as well as the information made available to the meeting will be reflected in the Matrix.

### 3.8 **Implementation Status in China**

3.8.1 China informed the meeting the status of implementation of CNS/ATM systems. The meeting noted that by the end of August 2001, all remote control ground station (RGS) will be deployed which will consist of one network management data process system (NMDPS) and 78 RGS stations. After the first trial flight on ATS Route L888 on 24 June 2000, L888 was put into operation in November 2000. It is planned to establish 4 ADS procedural control routes by 2005.

3.8.2 Under the China air-route navigation initial monitor system (CARSNIMS), a GNSS integrity monitor system had been established in China. Trials for HF datalink have been conducted in the western part of China. The HF datalink will be introduced in the western part of China to enhance communication capability.

**3.9 Implementation Status in Hong Kong, China**

3.9.1 Hong Kong, China made an excellent visual presentation providing an overview of the CNS/ATM project implementation plan for Hong Kong, China. The CNS/ATM Implementation Strategy consists of three phases with the implementation and transition phase starting in 2003 and completed in 2016. The meeting noted that D-ATIS and D-VOLMET were implemented in April 2001, and CPDLC/ADS trials are continuing. A preliminary ATN trial with Thailand commenced in October 2000, and AMHS trials with Japan and Australia had commenced from July 2001. Introduction of SMGCS and SSR Mode-S trial and studies for VDL mode 2 and GBAS are planned.

**3.10 ADS-C/ADS-B in Mongolia**

3.10.1 Mongolia informed the meeting of a demonstration being undertaken of ADS-C and ADS-B. ADS is seen as having great potential for Mongolia, as it has no civil radars but a modern ATC system and supporting infrastructure. The demonstration will consist of a system utilizing VDL Mode 4 datalink. The demonstration will be held in Ulaanbaatar from 25 to 26 September 2001.

**3.11 ADS-B trials**

3.11.1 Australia made a visual presentation providing the main characteristics of the ADS-B trials. Information was provided on the safe flight 21 trials in the US, and an evaluation of ADS/B, included in the European programme. The benefits of ADS-B were highlighted, and some details of ADS-B stations were also provided.

**3.12 Air Traffic Management Center in Japan**

3.12.1 Japan informed the meeting that Japan Civil Aviation Bureau (JCAB) plans to implement an Air Traffic Management Center in Fukuoka City to provide ATM service employing new CNS technologies to cope with future traffic demand. Rapid trans-pacific traffic growth has been experienced in recent years because new airports have been developed and are operating in the region. JCAB plans to implement ATMC in two phases, and the implementation commences in approximately October 2005 and will be completed in 2010.

**3.13 CNS/ATM implementation status in Russia**

3.13.1 The Russian Federation provided information on the results of the recent research and trials associated with implementations of CNS/ATM systems including ADS-A, ADS-B, CPDLC, Non-Precision Approach (NPA) and Precision Approach (PA) using GNSS procedures. An oceanic ATS center was setup in 2000 based in Magadan ACC, which serves all traffic on cross-polar routes 3 and polar 4 bridging North America and South-East Asia. The routes were opened for regular flights on 1 February 2001.

3.13.2 The ADS-B project using VDL mode 4 was launched in Tyumen region. The system installation will start in late 2001 to early 2002. It was suggested that ADS-B should be considered for possible use in South East Asia.

3.13.3 NPA was implemented at Kurumoch international airport and State Civil Aviation Authority of the Ministry of Transport of the Russian Federation is planning to continue NPA implementation at other Russian airports. Tests of GBAS manufactured in Russia are to be completed later this year and the SCAA is going to start implementing GNSS PA1 in 2002. The meeting was also informed that 7 GLONASS satellites are currently available and complete GLONASS constellation will be available within 4-6 years according to the plan and that several

combined GPS/GLONASS receivers were built in compliance with ICAO GNSS SARPs.

### 3.14 **Implementation Status in Bhutan**

3.14.1 Bhutan informed the meeting of the facilities provided at Paro airport and the difficulties faced in upgrading facilities and services. It was stated that the WGS-84 survey would be completed by August 2001. Bhutan is currently examining the available equipment, costs and provisions for introduction of applicable elements of the CNS/ATM systems.

### 3.15 **CNS/ATM Implementation Activities in Fiji**

3.15.1 The information paper provided by Fiji stated that a new EUROCAT 2000X system will be commissioned in the first week of December 2001 to replace the EASY system. The new system, which provides for both present and future requirements of airlines, is being installed in the new Air Traffic Management Centre close to the Nadi Control Tower. The system will provide ADS/CPDLC and AIDC and conflict probe function for air traffic management in the Nadi FIR.

### 3.16 **Oceanic Control: New Zealand System**

3.16.1 New Zealand advised the meeting how the Oceanic Control System (OCS) used by the Airways Corporation of New Zealand is able to safely deliver to the airlines current and future benefits of the ICAO CNS/ATM system. The OCS real time conflict probe has moved the standards of service provided to a new level and fundamentally changed the controller's role to one of conflict resolution focused on optimizing service to airline as opposed to conflict detection. The fully automated conflict detection enables the provision of full free flight providing track re-routes rather than level changes as the preferred method of conflict resolution resulting in savings to users in terms of time and fuel burn. The meeting was advised that the United States had announced that it would purchase this system and install it at their three Oceanic Control Centres located at Anchorage, Oakland and New York in 2003.

### 3.17 **Funding Arrangements for Monitoring Systems after February 2002**

3.17.1 The meeting considered information provided by the United States regarding the position of the Federal Aviation Administration (FAA) of the United States to discontinue providing the resources to support the RVSM approvals and monitoring for the Asia Region after February 2002. However, the FAA would continue to support the oversight for Pacific Region RVSM approvals and monitoring after that date. It was recalled that the monitoring requirement for RVSM is contained in the MID/ASIA and PAC SUPPS (RAC-9, paragraph 6.5.7.1 refers). A regional monitoring agency (RMA) called the Pacific Approvals Registry and Monitoring Organization (PARMO) was established by the eleventh meeting of the Informal Pacific Coordination Group (IPACG/11) for the implementation of RVSM in the Pacific Region. The services of PARMO was provided by the FAA Technical Center using FAA funding, at no cost to the users or other ATS provider States. Subsequently, the RVSM Task Force established by APANPIRG/9 (Decision 9/4 refers) accepted the offer of the United States to include the monitoring for the RVSM implementation programme for the Asia Region.

3.17.2 In addition to the RVSM monitoring programme, the meeting noted that monitoring of CNS/ATM systems by Central Reporting Agencies (CRAs) began in the Asia and Pacific Regions in 1997 in support of ICAO policy on CNS/ATM Systems Implementation and Operation. These activities have been expanded to include systems supporting the Boeing FANS-1 and Airbus FANS-A aircraft. The CRAs are funded by their respective ATS providers, FAA and the Japan Civil Aviation Bureau (JCAB), and the Boeing Company. In regard to the South Pacific CRA, initial funding was

provided by Boeing and later by other stakeholders using FANS-1/A technology for CNS/ATM applications.

3.17.3 Further, it was noted that at the eleventh meeting of the RVSM Task Force (Kuala Lumpur, 30 April to 4 May 2001), it was advised that the FAA would no longer be able to provide the present level of support to the RVSM Task Force and to APARMO after February 2002. At that meeting a request was made to identify a new Task Force Chairperson, new Chairpersons for the work groups, and a new organization to provide the services associated with APARMO as quickly as possible to allow for an adequate transition period with the current Chairpersons. The Task Force agreed that this matter would be finalized at the next meeting to be held at Denpasar, Indonesia from 10 to 14 September 2001.

3.17.4 The meeting was informed by IATA that they fully supported the need for monitoring for RVSM operations and other separation applications, and for CNS/ATM implementation and operation. It was acceptable to IATA that funding could be collected by IATA, if so requested by APANPIRG. However, in the opinion of IATA it was to be noted that these charges were as a result of a regulatory requirement for monitoring and were not additional airways fees or service provider charges. Also, the meeting stressed the need to identify the cost of the monitoring operations and to determine the charges to be made. Further, the meeting agreed that it was important to maintain a single RMA and a common database for the region.

3.17.5 The meeting considered the implication of the decision by the FAA to reduce its level of support to APARMO after February 2002 on the continuation of the RVSM monitoring programmes for the Asia and Pacific Regions. The meeting established a working group to examine the issues pertaining to the funding of the RMA and CRAs based on the information provided by the United States.

3.17.6 The group considered the funding requirements for the monitoring programmes and wider issues associated with monitoring for future implementation of RVSM and horizontal separation, and CNS/ATM systems in the Asia and Pacific Regions. The group considered that it was imperative that APARMO continue to function after February 2002 without degradation of the service it provided. There were issues to be resolved in the short term to address the question of funding and organizational matters for the continued management of APARMO. In particular, it would be necessary to establish an organization to undertake the RVSM monitoring duties and responsibilities for RVSM implementation in the Asia Region. In this regard, States should be approached to find out whether a State would be prepared take responsibility to operate the Asia RMA after February 2002.

3.17.7 The group was of the view that a central monitoring agency (CMA) should be maintained, and in principle, a proliferation of RMAs and separate databases should be avoided. In the long term, it would be necessary to establish arrangements to provide monitoring for future airspace changes. It was recalled that ICAO had provided airspace safety management provisions in Amendment 40 to Annex 11 and detailed procedures in Amendment 4 to the PANS-RAC (Doc 4444), which would be renamed PANS-ATM, applicable on 1 November 2001. These amendments would need to be examined and the implications for the region to establish additional airspace safety management programmes taken into account.

3.17.8 The group recognized that priority would need to be given to continuing the operation of APARMO and to determine an appropriate funding mechanism. In this regard, the group concluded that as a matter of urgency, APANPIRG/12 should establish a Task Force to determine appropriate arrangements for short-term funding to enable APARMO to continue without interruption at the present level of service. In regard to long-term funding of monitoring systems, the meeting

considered that the following issues should be addressed: regulatory and ATS service provider responsibilities; monitoring functions; organizational matters, funding; and implementation.

3.17.9 The meeting noted the report of the working group. The meeting identified that there was an urgent short term problem to fund the continued operation of APARMO and the CRAs after February 2002. The United States confirmed that the FAA would not continue to fund the APARMO operation after that date, and that funding from another source was required. Further, the FAA would be willing to provide the management and staff for the immediate future to continue its support for the Pacific RVSM programme, providing funds were made available. However, this would not include providing services for other RVSM implementations in other parts of the region including the Asia Region.

3.17.10 The meeting agreed that the ICAO requirement for monitoring the application of RVSM and on-going operation must be carried out to ensure that the established level of safety was being met, and continued to be met in ongoing operations. It was made clear that the funding of safety monitoring programmes was a regulatory requirement of States to meet ICAO provisions.

3.17.11 The meeting considered various options to obtain funds for APARMO and the following were considered to be the most practicable options;

- a) a new charge to be levied on all users and the billing and collection to be administered by IATA; or
- b) States to provide funds from the user charges presently being collected and to contribute a sum (to be agreed) to a central monitoring fund to operate APARMO.

3.17.12 In regard to the monitoring programme established for the North Atlantic airspace for horizontal separation and RVSM, the Secretariat would obtain detailed information on the funding arrangements. Of the options considered, the meeting agreed that in the short term, the most effective way to obtain funding would be through IATA. The meeting agreed with the comment by Australia that whatever levy is charged, this should only be on a cost recovery basis. Also, it would be necessary to obtain realistic figures on the cost of providing a monitoring service and this information should be provided to APANPIRG/12. It was noted that the cost of providing FANS-1/A monitoring by the CRA for the North, Central and South Pacific had been approximately US\$400,000 per year. This was based on an hourly fee that covered use of all required tools (simulators, laboratory benches, software tools etc). The United States indicated that they may be able to provide such information for the APARMO operation to APANPIRG/12.

3.17.13 The meeting also identified that there was a long term monitoring issue to be resolved, which would need to address future implementation of CNS/ATM systems and reduced separation minima both vertical and horizontal. This matter should be brought to the attention of APANPIRG/12 and a task force should be established to study the matter.

3.17.14 It was also suggested by the Philippines that the Cooperative Operational Safety and Continuing Airworthiness Programme (COSCAP) mechanism to collect funds, which was provided by States participating in the programme, should be taken into account when considering a long term solution to funding monitoring programmes.

3.17.15 The meeting agreed that, as a matter of urgency, funding was required for the APARMO and CRA monitoring programmes, and to establish an RVSM monitoring agency for the implementation of RVSM in the Asia Region after February 2002. Also, the long term monitoring

requirements for the Asia/Pacific Region would need to be addressed by APANPIRG/12. The meeting agreed to the following Draft Conclusions to be presented to APANPIRG/12:

**Draft Conclusion 8/1 – Short term funding of the RVSM and CRA system performance monitoring programmes in the Asia/Pacific Region**

That,

- a) as a matter of urgency, funding arrangements for RVSM and CRA system performance monitoring programmes be established in the Asia/Pacific Region after February 2002; and
- b) IATA be requested to provide the billing and collection mechanism for funding of APARMO and the CRAs to enable these system performance monitoring programmes to continue until a permanent solution is found.

**Draft Conclusion 8/2 – Establishment of a system performance monitoring agency for implementation of RVSM in the Asia Region**

That, as a matter of urgency, the APANPIRG RVSM Task Force establish a system performance monitoring agency for implementation of RVSM in the Asia Region including arrangements to obtain funding.

**Draft Conclusion 8/3 – Establishment of a long-term system performance monitoring organization for the Asia/Pacific Region**

That, a task force be formed to study the establishment of a long-term system performance monitoring organization for the Asia/Pacific region, taking into account the provisions in Amendment 40 to Annex 11 and Amendment 4 to the PANS-RAC (Doc 4444) for airspace safety management. Draft Terms of Reference is contained in **Appendix D** to the Report on Agenda Item 3.

**Summary Forecast by Route Group (1996/2010)**

**Table 19**

**Total Number of Seats Available**

	<b>1996</b>	<b>1999</b>	<b>2010</b>	<b>AAGR (%) 1999/2010</b>
Asia/Australia - Africa		1,382,140	2,892,155	6.9
Asia - Australia/New Zealand		16,869,733	35,238,417	6.9
Asia - Europe (North of Himalayas)		36,907,200	72,307,419	6.3
Asia - Europe ( South of Himalayas)		22,993,560	45,048,256	6.3
Asia - North America ( via Eastern Russian)		192,600	371,857	6.2
Asia - North America (via central & North Pacific)		39,002,778	75,630,335	6.2
Australia/New Zealand - South America		152,400	284,153	5.8
Australia/New Zealand - North America (via South Pacific)		4,021,796	7,906,984	6.3
South East Asia - North East Asia		47,495,531	74,646,978	4.2
<b>Total</b>		<b>169,017,738</b>	<b>314,326,554</b>	<b>5.8</b>

**Table 20**

**Total Number of Passengers**

	<b>1996</b>	<b>1999</b>	<b>2010</b>	<b>AAGR (%) 1999/2010</b>
Asia/Australia - Africa		939,855.2	2,082,351.6	7.5
Asia - Australia/New Zealand		11,808,813.1	25,371,660.3	7.2
Asia - Europe (North of Himalayas)		27,126,792.0	54,230,564.2	6.5
Asia - Europe ( South of Himalayas)		16,900,266.6	33,786,191.6	6.5
Asia - North America ( via Eastern Russian)		138,672.0	278,892.8	6.6
Asia - North America (via central & North Pacific)		28,082,000.0	56,722,751.1	6.6
Australia/New Zealand - South America		91,440.0	184,699.4	6.6
Australia/New Zealand - North America (via South Pacific)		2,935,911.1	5,930,238.4	6.6
South East Asia - North East Asia		32,296,961.1	55,238,763.7	5.0
<b>Total</b>		<b>120,320,711.1</b>	<b>233,826,113.1</b>	<b>6.2</b>

**Table 21**  
**Aircraft Movements**

	<b>1996</b>	<b>1999</b>	<b>2010</b>	<b>AAGR (%)</b> <b>1999/2010</b>
Asia/Australia - Africa	4,735	4,766	9,641	6.6
Asia - Australia/New Zealand	51,323	54,080	106,564	6.4
Asia - Europe (North of Himalayas)	131,295	102,520	170,135	4.7
Asia - Europe ( South of Himalayas)	55,030	63,871	105,996	4.7
Asia - North America ( via Eastern Russian)	577	535	896	4.8
Asia - North America (via central & North Pacific)	73,941	108,341	182,242	4.8
Australia/New Zealand - South America	245	420	710	4.9
Australia/New Zealand - North America (via South Pacific)	9,364	10,580	19,767	5.8
South East Asia - North East Asia	154,415	164,618	244,063	3.6
<b>Total</b>	<b>480,925</b>	<b>509,731</b>	<b>840,014</b>	<b>4.6</b>

**Table 22**  
**Load Factor**

	<b>1999</b>	<b>2010</b>	<b>AAGR (%)</b> <b>1999/2010</b>
Asia/Australia - Africa	68	72	0.5
Asia - Australia/New Zealand	70	72	0.3
Asia - Europe (North of Himalayas)	74	75	0.2
Asia - Europe ( South of Himalayas)	74	75	0.2
Asia - North America ( via Eastern Russian)	72	75	0.4
Asia - North America (via central & North Pacific)	72	75	0.4
Australia/New Zealand - South America	60	65	0.7
Australia/New Zealand - North America (via South Pacific)	73	75	0.2
South East Asia - North East Asia	68	74	0.8
<b>Total</b>	<b>70</b>	<b>73</b>	<b>0.4</b>

**Table 23**  
**Average Aircraft Seat Capacity**

	<b>AAGR (%)</b>		
	<b>1999</b>	<b>2010</b>	<b>1999/2010</b>
Asia/Australia - Africa	290	300	0.3
Asia - Australia/New Zealand	312	331	0.5
Asia - Europe (North of Himalayas)	360	425	1.5
Asia - Europe ( South of Himalayas)	360	425	1.5
Asia - North America ( via Eastern Russian)	360	415	1.3
Asia - North America (via central & North Pacific)	360	415	1.3
Australia/New Zealand - South America	363	400	0.9
Australia/New Zealand - North America (via South Pacific)	380	400	0.5
South East Asia - North East Asia	289	306	0.5
Total	341	380	1.0

### **The Implementation Status of CNS/ATM System**

#### **1. AUSTRALIA**

1.1 Development and research activities on the ATN through a project called Investigation of Networked CNS/ATM Applications (INCA) have been carried out in Australia. The aim of the project is to continue trials and acquire reliable information about the deployment of (CNS/ATM) applications and associated data communication network services in Australia.

1.2 An Automatic Message Handling System (AMHS) has been tested with procedure that automatically recovers all messages without data being lost, corrupted or duplicated. Facilities supporting ADS/CPDLC for FANS 1/A Aircraft are available and the Australian Advanced Air Traffic System or TAAATs has been put into operation. CPDLC and ADS have been implemented. AIDC is implemented with New Zealand.

1.3 Australia now has some 140 GPS non-precision approaches in place with an ongoing design program adding some 30-40 approaches per year. Australia has developed a primary means domestic en-route approval to provide GPS navigation in domestic airspace.

#### **2. BRUNEI DARUSSALAM**

2.1 Development of Brunei Darussalam CNS/ATM System is in accordance with ICAO's plan for a terminal area for high-density traffic with full radar coverage in the provision of air traffic control services within Brunei airspace. An advanced air traffic system is in operation with provision for mode S data link. WGS 84 implementation has been completed and airspace classification has been published. Further development would include establishment of GNSS augmentation as supplementary air navigation system for IFR arrivals and departures including GPS letdowns for non precision approach by 2002, an ATN connection by 2005 and ADS services as necessary pending on development of the proposal on joint airspace management of the Kota Kinabalu flight information region with Malaysia.

#### **3. CHINA**

3.1 A new CNS/ATM route L888 is being implemented in western part of China utilizing the ICAO new CNS/ATM concept and FANS technology. Features of the new route are:

- a) workstations providing ADS surveillance and CPDLC communications. VHF, HF and satellite telephone are used as backup;
- b) a trial flight utilizing the ADS/CPDLC function was conducted on 24 June 2000. The VHF Air/Ground Data Link Network Project will be implemented in 3 phases with about 100 Remote Ground Stations to be installed throughout China, 80 RGSs have been deployed in Phase I and II; and
- c) a dedicated aeronautical communications network has been put into operation since March 2000 with 16 nodes interconnected by both VSAT and DDN trunk circuits at speed of 128 Kbps. The network supports several communication protocols including Frame Relay and X.25

4. **HONG KONG, CHINA**

4.1 Hong Kong will implement the CNS/ATM systems in three phases. Phase 1 comprises of System Study & Analysis (1999-2004); Phase 2 covers CNS/ATM Trials & Evaluation (2000 –2007); and Phase 3 on CNS/ATM Implementation & Transition (2003 –2016 ).

4.2 A CNS/ATM Committee, with members from IATA, IFALPA, Cathay Pacific, HKATC Association etc, has been set up to discuss issues relating to the study, trial and implementation of CNS/ATM systems in Hong Kong.

4.3 So far, trials have been organized for ADS/CPDLC, D-VOLMET, PDC and ATN (with Thailand). With satisfactory and encouraging results, both D-ATIS and D-VOLMET has been put into operational use since 19 April 2001.

4.4 Planned trials include AMHS (with Australia), AIDC (with Guangzhou, China) and SMGCS.

5. **FIJI**

5.1 Fiji has set up a National CNS/ATM Planning Group to assist in the planning and implementation of the future CNS/ATM Systems. Currently, Fiji is able to provide CPDLC through the Automated Datalink Interim System, however, this is to be replaced by a new system later this year.

5.2 Fiji plans to commission it's new Enhanced ADS System (EASY) or Eurocat 2000X in December 2001, which will provide the following functions:

- a) ADS
- b) CPDLC
- c) FDPS

6. **FRENCH POLYNESIA - TAHITI**

6.1 VIVO 2, with CPDLC implementation was implemented in March 1996, and the dynamic airborne re-routing program (DARPS) phase 1 was implemented in July 1998. ADS was implemented with VIVO 3 installation in March 1999. Implementation of a limited subset of AIDC messages set is under discussion with neighboring FIRs.

6.2 The available functions are:

- a) CPDLC
- b) ADS
- c) ATM

7. **INDIA**

7.1 **Communication**

Routers and Gateways

7.1.1 Airports Authority of India has placed orders for the provision of routers and gateways. It is proposed to provide these at Kolkata and Chennai for trial operation. After successful

trial operation, these will be provided at Mumbai for test operation with Bangkok. Finally, it is planned to link Mumbai, the Gateway of India, with the neighboring countries as proposed in the ICAO Plan by the year 2005.

### RCAG

7.1.2 The RCAG Circuits between Kolkata-Port Blair, Kolkata-Vizag, Chennai-Port Blair & Chennai-Vizag, has already been implemented to provide VHF coverage over the Bay of Bengal using VSAT Circuits. The RCAG Circuits between Mumbai-Agatti and Mumbai-Porbandar is under test operation and going to be implemented by the end of year 2001.

## 7.2 **Navigation**

7.2.1 Airports Authority of India has decided to implement a Satellite Based Augmentation System (SBAS) which will cover the entire designated Indian Airspace. In the first phase, a Technology Demonstration System (TDS) would be implemented jointly by Airports Authority of India and Indian Space Research Organisation (ISRO). On successful implementation of TDS, the system will be expanded and redundancy built up in phases leading to a full operational capability system.

## 7.3 **Surveillance**

### RADARS

7.3.1 Airport Surveillance Radar (ASR) and Monopulse Secondary Surveillance Radar (MSSR) with Mode-S capability have been provided at 11 airports and one more Bahrampur (near Bhubaneshwar Airport) is under installation and likely to be commissioned by end of year 2001. With the provision of these Radars, the major ATS routes will come under surveillance coverage for aircraft flying at an altitude higher than 25,000 feet.

### ADS/CPDLC

7.3.2 ADS and CPDLC systems are already in operation at Kolkata Airport. The existing system will be replaced by an enhanced version supplied by M/s Electronics Corporation of India Ltd. (ECIL), India by October 2001.

7.3.3 M/s ECIL, India has already installed and tested ADS/CPDLC system at Chennai Airport. Training of Air Traffic Controllers (ATCOs) on the system is in progress. The system will be commissioned in September 2001.

## 8. **INDONESIA**

8.1 Communication: VSAT supporting ground communications operates to more than 40 stations all over the Indonesia Archipelago. Air-Ground data communication services are mostly supported by SITA, although the VHF Data link is also supported by ARINC.

8.2 Navigation: All international airports in Indonesia will implement GNSS-NPA procedures in the year 2002. RNP10 will be gradually implemented within Jakarta FIR from July/August 2001.

8.3 Surveillance: Almost 70% area in Indonesia is covered by radar, but some are not integrated technically. Operational trials on ADS/CPDLC within Jakarta FIR will commence in June/July 2001 for a 6 month period.

8.4 The new ATM station will be installed in Ujung Pandang/Makassar. The Radar, ADS/CPDLC including the AIDC functions will be blended into a single work station. The installation in the new ACC building will be finished sometime in April 2003.

## 9. JAPAN

9.1 ADS/CPDLC services are provided at Tokyo ACC. The data link operation within the Tokyo FIR commenced in October 1997 using the ODP-2.5 system. This was upgraded to a new system ODP-3 that became operational in June 2000. The ODP-3 system includes an electronic strip display and conflict probe functions. CPDLC is currently the primary means of communications within Tokyo oceanic airspace with HF as a back up.

9.2 Some 16 airlines and 80 data link capable aircraft per day use ADS/CPDLC. Japan intends to apply 50NM longitudinal separation for RNP-10 or better certified aircraft in the cruise phase of flight, when the new Multi-functional Transport Satellite-MTSAT-1 becomes operational.

9.3 New MTSAT-1 and MTSAT-2 will be launched in early 2003 and in the summer of 2004 respectively. The AMSS functions will become operational within fiscal year 2003. MTSAT Satellite-based Augmentation System (MSAS) will commence its initial operation in Japan in 2004.

## 10. LAO PDR

10.1 GNSS will be used as supplemental means for en-route, terminal area and approach and landing starting year 2010 in accordance with ICAO SARPs.

10.2 Three radars have been provided, two of them in Vientiane and one in Savannakhet in the Southern province of Lao PDR.

10.3 The long range radars provide coverage of nearly 400 KM and are used for en-route control. The combination of Vientiane and Savannakhet Radars covers most of the LAO PDR airspace, at least for the altitude of the main commercial flights.

10.4 ADS/CPDLC services are expected to provide using SITA or ARINC services.

## 11. MONGOLIA

11.1 A decision was made to adopt the ICAO CNS/ATM implementation plan which included the preparation of a domestic GPS route structure; the equipping of the domestic fleet with GPS; the introduction of GPS non-precision approaches at the regional airports to supplement NDB only guidance; the construction of a new Area Control Centre and Control Tower; the provision of ATM workstations capable of utilizing ADS/CPDLC; and an extensive network of RCAG and VSAT stations throughout the country to provide the necessary communications for coordination functions.

11.2 Most of this work is now complete. ADS workstations are operational with the flight progress of all suitably equipped aircraft monitored; CPDLC has been trialed and is tested on a regular basis; the use of GPS as a primary means of navigation has been approved by the CAA and is in full operation on the domestic network; GPS procedures are being drafted for Ulaanbaatar International Airport and the regional airports and will be approved upon completion of flight-testing.

12. **MALAYSIA**

12.1 Malaysia is focusing on the implementation of ADS/CPDLC in the Bay of Bengal and South China Sea areas where there is no radar coverage. Stand-alone ADS equipment has been installed and currently is on technical test. ADS/CPDLC system evaluation will take place from October 2000 to December 2004. A Primary and Secondary Radar System will be installed at Miri to provide full radar coverage in the Kota Kinabalu FIR.

13. **NEPAL**

13.1 Nepal launched a CNS/ATM project in 1995 to implement CNS/ATM system in a phased manner. National CNS/ATM Transition Plan has been prepared in 1998 for implementation within 2008.

13.2 Transformation of airports and Navigation Aids coordinates into WGS-84 system has been completed in 1998 and incorporated in AIP Nepal.

13.3 GPS based non-precision approach procedures for 7 airports including Tribhuvan International Airport have been prepared and currently being evaluated for implementation.

13.4 Automatic Message switching system, at TIA has been upgraded and action has been initiated to introduce VSAT link to support ground-to-ground communication.

14. **NEW ZEALAND**

14.1 The Oceanic Control System (OCS) went operational during mid – 2000 after a five – year period of testing using an Interim OCS and a transitional period before OCS came on line. The OCS has ADS, conformance monitoring, CPDLC and has been performing ATS Inter – facility Data Link Communications (AIDC) with Australia. AIDC testing with the USA and Fiji is due to commence shortly.

14.2 New Zealand has implemented RNP10 from FL 245 to FL460 and RVSM from FL290 to FL410 within the Auckland Oceanic FIR. The domestic AIRCAT radar system is being replaced over the next two years by the Lockheed Martin SKYLINE system, which is expected to include Minimum Safe Altitude Warning (MSAW) and Short Term Conflict Alert (STCA, already used on AIRCAT) and has facility for ADS, AIDC and CPDLC.

15. **PHILIPPINES**

15.1 The Master Plan for CNS/ATM systems has been developed in which high priority projects were identified and project implementation is expected to complete in 2006. Under the Plan, the Manila ATM Center will combine the Manila ACC, Mactan Sub-ACC and all Approach Control Units. The ATM automation system will be integrated system consisting of data processing sub-systems, data acquisition sub-systems, consoles, displays, etc. It will also include functions such as Air Traffic Management Functions, Safety Measure Function, Weather Information Functions and Data Recording. The communications system will utilize the ATN, D-ATIS, AMHS and VSAT. The navigation system will utilize SBAS and GBAS while the surveillance system will utilize ADS and three new SSR radars.

16. **PAKISTAN**

16.1 WGS-84 survey of airports, waypoints etc in Pakistan has been completed and will shortly be published for implementation. Pakistan has continental airspace covered by SSR and extended VHF. The up graduation of present Radar system will include built in ADS & CPDLC, which is being evaluated. With complete SSR coverage and extended VHF CAA Pakistan will be able to implement RNP-10 and RNP-5 as and when such routes are implemented in the region. ATN will be considered in phase-II (2005-2010) of CNS/ATM implementation.

17. **SINGAPORE**

17.1 Singapore provides ADS/CPDLC services for FANS-1/A equipped B747-400s and B777s operating in the Singapore FIR. This service is provided round the clock and is used primarily in areas beyond radar cover in the South China Sea.

17.2 ADS/CPDLC service for B747-400 first commenced in February 1997 on a limited time basis using a standalone workstation. In February 1999, the ADS/CPDLC system was integrated into LORADS II (the Singapore ATC system) and the service was extended to 24 hours from October 1999. Modifications were carried out to enable B777s to logon and this was completed in June 2000.

17.3 The average logon per month is 1800, or about 60 per day (current as at July 2001). This constitutes about 35% percent of the traffic on the major trunk routes over the South China Sea. Major users include Singapore Airlines, Cathay Pacific Airways, Thai International and Qantas.

17.4 Datalink ATIS service commenced in February 2000 and is available 24 hours.

18. **SRI LANKA**

18.1 Installation of new equipment capable of providing ADS/CPDLC services commenced in May 2000 and was completed in July 2000. The Sri Lanka Air Traffic Control Centre now has operational capabilities of providing following services using ADS, CPDLC, a Flight Plan Air Situation Display and Flight Data Processing;

18.2 The EASY system will be available on 24 hours basis from 01 November 2000. Sri Lanka requested all FANS 1/A equipped aircraft to "log-on" with Colombo Area Control Centre (VCCC) when over flying Colombo airspace.

19. **THAILAND**

19.1 The communications infrastructure for the ATN in Thailand is being implemented to support the new CNS/ATM. During the transition period, the AFTN/ATN gateway and ATS Message Handling System have been implementing within the country since 1999.

19.2 The ATS Messages Handling System or AMHS comprises of a set of ATS Message Servers, ATS Message User Agents, and AFTN/AMHS gateways. After the successful implementation of ATN within Thailand, AEROTHAI decided to connect the network with other organizations and countries. Currently an ATN trial connection with Hong Kong, China is successfully tested using Inter Domain Routing Protocol (IDRP).

19.3 ADS/CPDLC have already been implemented. The successful inaugural trial was conducted at the end of 1996. ADS/CPDLC are used to communicate with aircraft on ATS route UM 501 and in certain other areas within Bangkok FIR. ADS/CPDLC are expected to be used for routine

transactions. AEROTHAI Satellite Telecommunications Network or AERONET, established in 1992, has been developed continuously in order to serve the expansion of CNS/ATM systems, which consists of Star and Mesh topology. AEROTHAI also is a service provider that provides AERONET connection for its customers.

20. **USA**

20.1 The initial operating capability of the Wide Area Augmentation System (WAAS) is expected to be available from December 2003.

20.2 Local Area Augmentation System or LAAS will allow precision approach capability from CAT I down to CAT III levels. CAT I type acceptance by FAA is expected in September 2002. An initial Category I public use LAAS system is scheduled by 2003 and a Category III public use LAAS system by late 2006.

20.3 The initial operational capabilities of ADS/CPDLC service for operational use at Oakland Center and Anchorage Center are expected to be available in April 2003 and in April 2004 respectively.

21. **VANUATU**

21.1 Vanuatu is investigating the implementation of new ground/ground communication systems and ADS. Every effort is being made to implement appropriate CNS/ATM systems.

22. **VIET NAM**

22.1 There are 5 SSR and 3 PSR radar sensors in operation in Vietnam. The sixth SSR radar sensor on the southern tip of Vietnam will be put into operations before October 2001. This will allow full radar coverage over Vietnam's area of responsibility. The RDPs in Hanoi and Ho Chi Minh ACCs process the signals from all radar sensors. VSAT stations have been installed for ground-to-ground communication with Lao PDR, Cambodia, and Thailand. The VSAT network comprises 23 stations in the whole country.

**ASIA/PAC Checklist for Introduction of GNSS based operations**

En-route/NPA			Remarks
No.	Items to check	Reference	
1.	Establish GNSS Implementation Team (GIT); Establish a GNSS Office and designation of program/project officers –normally from regulator/service provider -Funding -Staffing  The Terms of Reference of GIT is provided in the Annex 1 to this Checklist.	ICAO Circular 267-AN/159 for GIT composition as mentioned in 6.10.2 Section of the Circular; Refers to draft appendix 1 to the GNSS manual for a sample TOR of the GIT.	GIT possible members include: -CAA; -Operations; -ATS; -Airworthiness; -Industry; -Airlines; -General Aviation; -Defense; -Maintenance provider; -Pilot training.
2.	State Plan – define and confirm State operational requirements and Regulation changes: - En-route, NPA/APV, GPS arrivals - PA at selected airports - Produce Orders, AIC, AIP SUPS, MATS amendments etc.	FAA Advisory Circular (AC) 90-94A, Guidelines for Operators using GPS equipment for IFR En Route and Terminal Operations and for NPA in the U.S. National Airspace System; FAA Order 7100.10A-Air Traffic Satellite Navigation Plan.	Draft and publish - Advisory Circulars - AIC - Aeronautical Information Circular; - AIP supplements.
3.	Define Operations and ATS requirements - Determine Operation Use Policy; - Separation Standard application; - Establish ATC GNSS Use Procedures;		
4.	Basic constellation augmentation requirements Determine Augmentation Policy.	SARPs for augmentation systems	ABAS; GRAS SBAS; GBAS.
5.	WGS-84 -Ensure WGS-84 compliant; -WGS-84 survey and publications; -Ensure database vendors provide WGS-84 data.	ICAO World Geodetic System-1984 (WGS-84) Manual Doc9674-AN/946	
6.	En route Domestic/Oceanic & Remote Standards - Define and publish borders between standards - Education on standards and differences		
7.	NPAs - Locations selection - Obstacle survey and database - Airfield status - Use NPA Procedure Design Criteria PANS/OPS; - Publish GNSS Arrival Procedures - Environmental considerations	Chapter 33 and its appendix of PANS/OPS Doc8168 Vol-II, for basic GNSS receivers	Instrument Approach Procedure
8.	Airport standard: - Upgrade to instrument runway; - Obstacle Limit Surface (OLS); - Maintenance of OLS; - Suitability for straight in approach; - Windsock and supporting requirements; - Altimeter setting availability; - Lighting.	Annex 14	

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En-route/NPA			Remarks
No.	Items to check	Reference	
9.	Determine and Implement Receiver Standard <ul style="list-style-type: none"> <li>- Equipment installation Policy –Supplemental Type Certificate or equivalent;</li> <li>- Conduct Airworthiness Training and approvals;</li> <li>- Establish rule for GPS for terrestrial navigation aid substitution;</li> <li>- Changes to equipment carriage requirements</li> <li>- Limitation of TSO C129 receivers</li> </ul>	Rx Design Standard (Selection) TSO-C129; TSO-C145; TSO-C146 (Stand alone).	TSO C129 (FD Limitation): Alternate solution + Barometric aiding;
10.	Operation approval: <ul style="list-style-type: none"> <li>-Primary means</li> <li>-Supplemental means</li> </ul>	Regional strategies for implementation of GNSS air navigation capability and the provision of precision approach and landing guidance systems	GPS as a primary means of Navigation in Oceanic/remote Operations; -N8110-60; -AC20-138.
11.	Flight Inspection and validation; <ul style="list-style-type: none"> <li>- Topography and obstacle assessment;</li> <li>- Flight Inspection;</li> <li>- Selection of suitable aircraft for inspection;</li> <li>- Transit times/low/slow flying capability;</li> <li>- Fuel reserves/Communications requirements;</li> <li>- Proper avionics</li> </ul>	DRAFT Volume 2 Chapters 1 and 2 of DOC 8071.	
12.	Crew training and approval -Pilot Endorsement <ul style="list-style-type: none"> <li>- Aircraft equipment endorsement</li> <li>- Validation training</li> <li>- GNSS training and approval</li> <li>- Operation familiarization</li> </ul>	Australian GPS Non Precision Approaches Instructor Pack-GPSIP CASA; and GPSIP2 CASA	
13.	Licensing: <ul style="list-style-type: none"> <li>-Pilot instrument rating requirements;</li> <li>-En route use;</li> <li>- NPAs.</li> </ul>		
14.	GNSS signal monitoring and recording facilities in place.	<i>State that approves GNSS-based operations should ensure that GNSS data relevant to these operations are recorded. The requirement is specified in the Amendment 76 to Annex 10 Vol. II. <a href="#">This recording may be done by non aviation agencies such as Geodetic Survey Organization.</a></i>	<i>For use in accident and incident investigations and may also support periodic confirmation that accuracy, integrity, continuity and availability are maintained.</i>
15.	Establish procedures for ensuring database consistency: <ul style="list-style-type: none"> <li>- Approach Publication;</li> <li>- Implementation;</li> <li>- Operational Testing;</li> <li>- Training;</li> <li>- Flight Operations Inspectors;</li> <li>- Air Traffic Controllers;</li> <li>- Airworthiness;</li> <li>- Pilots and check pilots</li> </ul>		Data Cards – to be integrated in Receivers. Responsibility for the correct data made by Jeppeson , Alternately can be got through Internet.
16.	Operational Training: <ul style="list-style-type: none"> <li>- Procedure design</li> <li>- Air traffic controller</li> </ul>	8168 Vol II Carper 3	

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En-route/NPA			Remarks
No.	Items to check	Reference	
17.	NOTAMs - For GPS, use Status message from USA - RAIM Prediction System (RPS) (if applicable)	RAIM Prediction Service (Australia Airservices website)	(Convert Message into operational NOTAMs for meeting the requirement)
<u>18.</u>	<u>GNSS Incident or Anomaly Reporting</u>	<u>GNSS Incident or Anomaly Reporting Form. The draft form is provided in the Annex 2 to this Checklist.</u>	<u>It is required to forward to the website address: <a href="http://Navcen.uscg.gov/gps">Navcen.uscg.gov/gps</a></u>
<u>19.</u>	Post Implementation Review - Procedures compliance; - Revision of Documentation; - Incorporation of AIP Supplements into AIP; - Maintenance of approach Obstacle Limit Surfaces, Airfield status; - Conventional Navigation Aid Policy; - Consolidation Policy – navigation aid withdrawal.		

## ANNEX 1 TO THE GNSS CHECKLIST

### GNSS IMPLEMENTATION TEAM TERMS OF REFERENCE

#### 1.0 INTRODUCTION

This document sets out the Terms of Reference for the Global Navigation Satellite System (GNSS) Implementation Team, which includes members from regulatory and service provider organizations, and user representatives. It defines the roles of participants with respect to the implementation of GNSS operations.

A common goal of the regulator and service provider is to ensure that aircraft operators receive the benefits of GNSS technology in a timely and effective fashion while maintaining high standards of safety. The GNSS Implementation Team will support this goal by fostering a cooperative approach to developing the standards, systems, procedures and the terms and conditions of regulatory approvals that respond to the needs of the aviation community.

Regulating GNSS and providing GNSS related services require that various branches in the regulatory and service provider organizations allocate resources to specific tasks. A key goal of the GNSS Implementation Team is to identify resource requirements to allow managers to plan effectively. The GNSS related roles of branches and divisions in the two organizations are described in section 2.

Material developed by ICAO, including SARPs, Guidance Material and Manuals, form the basis for the actions taken by the GNSS Implementation Team. In the early stages, research sponsored by the Team will add to the body of knowledge needed to develop ICAO documentation. As GNSS evolves, the Team will be able to reply to a large extent on this documentation.

#### 2.0 ROLES

##### 2.1 Service Provider

##### 2.1.1 Satellite Navigation Program Office (SNPO)

- a) act as the focal point for the development of satellite navigation technology for aviation purposes;
- b) complete trials and studies to prove GNSS concepts and test performance against safety standards;
- c) coordinate efforts internationally to avoid duplication of effort;
- d) provide guidance to the Member of the ICAO GNSS Panel, to ensure that international standards reflect national requirements, and participate in Panel working groups, as appropriate;
- e) coordinate the delivery of service based on satellite navigation technology to aircraft operators;
- f) develop performance requirements for GNSS augmentation systems, and specify augmentation system architecture to meet operational requirements;

- g) field and test prototype augmentation systems to minimize risk with operational systems;
- h) work with aircraft operators, aviation systems manufacturers, the academic community and users in other disciplines to ensure that augmentation systems meet requirements effectively and efficiently;
- i) maintain knowledge of aircraft, pilot and operator certification standards and work with certification staff to ensure approvals are consistent with GNSS performance;
- j) determine the economic viability of implementing augmentation systems, and develop appropriate strategies for fielding these systems and decommissioning traditional navigation aids;
- k) develop the necessary documents to obtain funding for operational augmentation systems;
- l) promote the use of satellite navigation technology, and assist aircraft operators to make informed decisions on equipage, through publications, presentations, other media and direct contact;
- m) encourage the safe use of GNSS by contributing to safety awareness programs;
- n) maintain detailed knowledge of satellite navigation avionics standards and performance, including pilot interface characteristics;
- o) recommend satellite navigation procedure design features to exploit the strengths of the technology while minimizing pilot workload and the possibility of pilot error;
- p) co-ordinate the development of survey standards to meet the accuracy requirements of satellite navigation approach procedures; and
- q) participate in the development of GNSS equipment standards.

#### 2.1.2 National Flight Inspection Organization

- a) complete flight trials and system performance studies to support GNSS implementation;
- b) monitor GNSS performance; and
- c) complete necessary flight inspections for non-precision and precision approaches.

#### 2.1.3 Aeronautical Information Services

- a) develop approach and other GNSS procedures;
- b) complete in-flight checks of GNSS procedures to assess flyability and obstacles;
- c) co-ordinate airspace-related GNSS issues with ATS;

- d) verify GNSS instrument procedures submitted by designers;
- e) develop depiction standards for GNSS instrument procedures;
- f) develop standards for and control input to databases containing GNSS procedure coordinates, including participation in international standards bodies;
- g) provide aeronautical information on GNSS procedures to database suppliers and chart producers; and
- i) incorporate GNSS information in the NOTAM system.

#### 2.1.4 Planning and International/Government Liaison

- a) incorporate GNSS material provided by SNPO in national and international planning documents; and
- b) incorporate the level of service criteria and planned decommissioning of traditional navigation aids into national and international planning documents.

#### 2.1.5 Operational Requirements and Level of Service

- a) develop detailed operational requirements for decommissioning traditional navigation aids, based on strategy developed by the SNPO; and
- b) complete aeronautical studies associated with decommissioning traditional navigation aids.

#### 2.1.6 Engineering

- a) develop technical specifications for augmentation systems;
- b) procure and field GNSS augmentations, including related communications systems;
- c) perform life cycle management of augmentation systems;
- d) develop hardware and software to support GNSS flight inspections, trials and studies;
- e) complete studies and investigations on the frequency interference aspects of GNSS performance;
- f) provide spectrum management to protect GNSS frequencies; and
- g) participate in the ICAO GNSS Panel to contribute to the development of international standards, recommended practices and guidance material.

#### 2.1.7 Air Traffic Services

- a) develop procedures to support GNSS operations;
- b) provide air traffic services to support satellite navigation operations; and

- c) participate in the development of GNSS instrument procedures and in the development of the strategy and plans for decommissioning traditional navigation aids.

#### 2.1.8 System Safety

- a) monitor the introduction of satellite navigation technology to identify potential hazards.

### 2.2 Regulator

#### 2.2.1 ANS & Airspace

- a) Monitor the service provider's research and development of GNSS technology, and consider the service provider's recommendations for operational approvals based on this technology;
- b) Assist with development activities to maintain knowledge of technology and operational applications;
- c) Develop GNSS instrument procedure design standards;
- d) Oversee the certification of GNSS augmentation systems and related airspace procedures, and monitor compliance;
- e) Introduce airspace procedures appropriate to the capabilities of satellite navigation technology;
- f) Approve survey standards;
- g) Approve database integrity standards and monitor for compliance;
- h) Evaluate aeronautical studies completed by the service provider to assess the impact of decommissioning traditional aids;
- i) Publish GNSS information, provided by the SNPO and other GNSS Implementation Team members, in various publications; and
- j) Conduct ongoing safety oversight of the service provider's Safety Management Program with respect to the introduction of satellite navigation technology.

#### 2.2.2 Aircraft Certification

- a) develop national standards and guidance material for the certification of GNSS equipment and its installation and certification in nationally-registered aircraft. Where necessary the development of standards and guidance may be accomplished as a joint effort with other Airworthiness Authorities to minimize duplication of effort and maximize harmonization;
- b) certify or oversee the certification, as applicable, of GNSS avionics equipment designed and manufactured nationally as well as the installation of all GNSS equipment installed in nationally registered aircraft; and
- c) participate in the development of GNSS avionics standards via bodies such as RTCA.

### 2.2.3 Commercial and Business Aviation

- a) develop crew training and certification standards for the use of GNSS avionics by commercial and business aircraft operators; and
- b) approve the operational use of GNSS technology by commercial and business aircraft operators.

### 2.2.4 General Aviation

- a) develop flight instructor guidelines & flight test standards for the use of GNSS avionics by general aviation aircraft operators; and
- b) in the course of Instrument Flight Tests and Commercial Pilot - Aeroplane Flight Tests, assess the ability of general aviation pilots to use GNSS avionics.

### 2.2.5 Aerodrome Safety

- a) develop standards for the physical characteristics and obstacle limitation requirements at aerodromes as they affect GNSS instrument approach operations; and
- b) assess the application of GNSS to Advanced Surface Movement Guidance and Control Systems (ASMGCS) at airports, and develop standards as appropriate, to support the “gate to gate” air traffic management concept.

### 2.3 Aircraft Services

- a) provide suitably-equipped aircraft and simulators to support GNSS trials and studies; and
- b) provide suitably-equipped aircraft and simulators to regulatory personnel to support their requirement for currency with GNSS operations.

### 2.4 System Safety

- a) monitor the introduction of GNSS technology to identify potential hazards.

### 2.5 User Representatives

- a) a wide cross section of users can provide strategic guidance and detailed recommendations on GNSS implementation; and
- b) specific users can participate in working groups assessing issues of significance to them.

## ANNEX 2 to the GNSS CHECKLIST

### ORIGINATOR INFORMATION

Prepared by:

Address:

Date:

Telephone:

Facsimile:

E-mail:

### GPS EQUIPMENT INFORMATION

Aircraft Registration:

GPS Receiver Type:     Hand-held

TSO C129 Approved:    Yes/No

GPS Make/Model:

GPS Antenna Location:    on aircraft

Remarks:

Aircraft Type:

Panel Mount

Installation Approved for:

suction cup

FMS Sensor

IFR    VER

on unit

### OCCURANCE INFORMATION

Date of Occurrence:

Approx. Altitude:

Approx. Time of Occurrence:

Approx. Location of Occurrence: (Lat/Long or Nearest City of Landmark):

What did the receiver indicate during the problem?

Large position errors (details):

Loss of integrity (RAIM warning/alert):

Loss of coverage/details:

Loss of satellites in view/details:

Degraded signal to noise/details:

Other:

Problem duration:     Seconds

Minutes

Hourso Days

What did the receiver indicate prior to the problem?

Action taken by operator to correct problem, or did the anomaly resolve itself:

Possible causes: (e.g. on board VHF radio transmission, TV/Radio transmitter antennas, buildings, suspicious activity)

Comments or details:

**DRAFT TERMS OF REFERENCE OF THE ASIA/PACIFIC REGION  
SYSTEM PERFORMANCE MONITORING ORGANIZATION TASK FORCE**

The Draft Terms of Reference are as follows:

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

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#### **Agenda Item 4: Review of CNS/ATM implementation priorities for the Asia/Pacific Region**

##### **4.1 Transition to WGS-84 in the Asia/Pacific Region**

4.1.1 The meeting recalled that in early 1994 ICAO Annexes 4, 11, 14 and 15, introduced the World Geodetic System 1984 (WGS-84) as the world-wide common geodetic reference datum. These new provisions required States to publish all relevant aeronautical data in WGS-84 on or before 1 January 1998. By 1 January 1998 WGS-84 had been fully or partial implemented by only 21 Contracting States/Non-Contracting States/Territories in the Asia/Pacific Region.

4.1.2 In order to facilitate WGS-84 implementation in the Region, the ICAO Asia and Pacific Office held a WGS-84 Training Seminar in Bangkok in November 1995 and a WGS-84 Special Implementation Project (SIP) for 8 States in Asia was carried out during the first quarter of 1997.

4.1.3 It was noted that the ATS/AIS/SAR Sub-Group had been tasked by APANPIRG to facilitate and monitor the implementation of WGS-84 in the Asia/Pacific Region. To this end, the ICAO Regional Office maintains the WGS-84 implementation status report based on information received from States and Territories.

4.1.4 The meeting also recalled that following review in June 2000 of the global implementation of WGS-84, the Air Navigation Commission called upon States and PIRGs to adopt a standard format, similar to the one adopted by the CAR/SAM/3 RAN Meeting, as the standard format for reporting of detailed and up-to-date implementation of WGS-84. Consequently APANPIRG/11 developed the following Conclusion:

*Conclusion 11/5 - Uniform format for the reporting of WGS-84 implementation*

*That States adopt the table available at the Appendix E (to the report on Agenda Item 2.1) as an uniform format for reporting of WGS-84 implementation.*

4.1.5 In a follow-up of the above Conclusion 11/5, the new table was forwarded to States and Territories in the Asia/Pacific Region on 22 December 2000, who were asked to submit up-to-date and detailed information related to their WGS-84 implementation status. The Regional Office compiled the responses and presented the results at the ATS/AIS/SAR/SG/11 as shown at **Appendix A** to the Report on Agenda Item 4.

4.1.6 The meeting noted the content of the table, which ATS/AIS/SAR/SG/11 reviewed and updated. There was no further update at the meeting. However, the meeting urged States who had not submitted the necessary information to ICAO to provide this information as soon as possible.

##### **4.2 Key Priorities for CNS/ATM Implementation**

4.2.1 The meeting reviewed the Key Priorities and noted that the task to develop ATN transition plan was completed. The meeting reviewed information under the column Milestone and Status and updated the information where required.

4.2.2 The meeting supported the proposal made by the CNS/MET/SG/5 to include two new items: final phase of WAFS; and MET Chapter 8 of the ASIA/PAC Regional Plan for the New CNS/ATM System, in the List of Key Priorities. In addition, a further item, Datalink communications, was added to the list by the meeting.

4.2.3 The proposed amendments have been marked up and provided in **Appendix B**. The meeting proposed these changes for consideration by APANPIRG and formulated the following draft decision.

**Draft Decision 8/4 - Amendment of the Key Priorities for CNS/ATM Implementation**

That, the Key Priorities for CNS/ATM implementation be amended as shown in Appendix B.

## STATUS OF WGS-84 IMPLEMENTATION

### *EXPLANATION OF THE TABLE*

*Column*

- 1 Name of the State, territory or aerodrome for which WGS-84 coordinates are required with the designation of the aerodrome use:
  - RS - international scheduled air transport, regular use
  - RNS - international non-scheduled air transport, regular use
  - RG - international general aviation, regular use
  - AS - international scheduled air transport, alternate use
- 2 Runway designation numbers
- 3 Type of each of the runways to be provided. The types of runways, as defined in Annex 14, Volume I, Chapter 1, are:
  - NINST - non-instrument runway;
  - NPA - non-precision approach runway;
  - PA1 - precision approach runway, Category I;
  - PA2 - precision approach runway, Category II;
  - PA3 - precision approach runway, Category III.
- 4 Requirement for the WGS-84 coordinates for FIR, indicated by the expected date of implementation or an "X" if already implemented.
- 5 Requirement for the WGS-84 coordinates for Enroute points, indicated by the expected date of implementation or an "X" if already implemented.
- 6 Requirement for the WGS-84 coordinates for the Terminal Area, indicated by the expected date of implementation or an "X" if already implemented.
- 7 Requirement for the WGS-84 coordinates for the Approach points, indicated by the expected date of implementation or an "X" if already implemented.
- 8 Requirement for the WGS-84 coordinates for runways, indicated by the expected date of implementation or an "X" if already implemented.
- 9 Requirement for the WGS-84 coordinates for Aerodrome/Heliport points (e.g. aerodrome/heliport reference point, taxiway, parking position, etc.), indicated by the expected date of implementation or an "X" if already implemented.
- 10 Requirement for geoid undulation indicated by the expected date of implementation or an "X" if already implemented.
- 11 Requirement for the WGS-84 Quality System, indicated by the expected date of implementation or an "X" if already implemented.
- 12 Requirement for publication of WGS-84 coordinates in the AIP indicated by the expected date of publication or an "X" if already published.
- 13 Remarks

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**STATUS OF WGS-84 IMPLEMENTATION**

STATE, TERRITORY OR AERODROME FOR WHICH WGS-84 IS REQUIRED			WGS-84 IMPLEMENTATION									REMARKS
CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>AUSTRALIA</b>												
<b>YPAD ADELAIDE/</b>												
Adelaide	05	NPA			X	X	X	X				
RS	23	PA1				X	X	X				
	12	NPA				X	X	X				
	30	NPA				X	X	X				
<b>YBBN BRISBANE/</b>												
Brisbane	1	PA1			X	X	X	X				
RS	19	PA1				X	X					
	14	NPA				X	X					
	32	NPA				X	X					
<b>YBCS CAIRNS/</b>												
Cairns	12	NPA			X	X	X	X				
RS	30	NPA				X	X					
	15	PA1				X	X					
	33	NPA				X	X					
<b>YPDN DARWIN/</b>												
Darwin	11	NPA			X	X	X	X				
RS	29	PA1				X	X					
	18	NINST				X	X					
	36	NPA				X	X					
<b>YMML MELBOURNE/</b>												
Melbourne	09	NPA			X	X	X	X				
RS	27	PA1				X	X					
	16	PA1				X	X					
	34	NPA				X	X					
<b>YPPH PERTH/</b>												
Perth Intl	03	NPA			X	X	X	X				
RS	21	PA1				X	X					
	06	NPA				X	X					
	24	PA1				X	X					
	11	NPA				X	X					
	29	NPA				X	X					
<b>YSSY SIDNEY/</b>												
Kingsford Smith Intl	07	PA1			X	X	X	X				
RS	25	NPA				X	X					
	16L	PA1				X	X					
	34R	PA1				X	X					
	16R	PA1				X	X					
	34L	PA1				X	X					
<b>YMAV AVALON/</b>												
Avalon	18	PA1			X	X	X	X				
AS	36	NPA				X	X					
<b>YBRM BROOME/</b>												
Broome	10	NPA			X	X	X	X				

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STATE, TERRITORY OR AERODROME FOR WHICH WGS-84 IS REQUIRED			WGS-84 IMPLEMENTATION									REMARKS
CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
RS	28	NPA				X	X					
YSCB CANBERRA/					X			X				
Canberra	12	NPA				X	X					
AS	30	NPA				X	X					
	17	NPA				X	X					
	35	PA1				X	X					
YSCH COFFS HARBOUR/					X			X				
Coffs Harbour	03	NPA				X	X					
AS	21	NPA				X	X					
	10	NPA				X	X					
	28	NPA				X	X					
YBCG COOLANGATTA/					X			X				
Coolangatta	14	NPA				X	X					
AS	32	NPA				X	X					
	17	NPA				X	X					
	35	NPA				X	X					
YMHB HOBART/					X			X				
Hobart	12	PA1				X	X					
RS	30	NPA				X	X					
					X			X				
Learmonth	18	NPA				X	X					
AS	36	NPA				X	X					
YLHI LORD HOWE ISLAND/					X			X				
Lord Howe Island	10	NPA				X	X					
RS	28	NPA				X	X					
YPPD PORT HEDLAND					X			X				
Port Hedland	14	NPA				X	X					
AS	32	NPA				X	X					
	18	NPA				X	X					
	36	NPA				X	X					
YBTL TOWNSVILLE/					X			X				
Townsville	01	PA1				X	X					
AS	19	NPA				X	X					
	07	NPA				X	X					
	25	NPA				X	X					
YBAS ALICE SPRINGS/					X			X				
Alice Springs	06	NPA				X	X					
AS	24	NPA				X	X					
	12	PA1				X	X					
	30	NPA				X	X					
	17	NPA				X	X					
	35	NPA				X	X					
YSDU DUBBO/					X			X				
Dubbo	05	NPA				X	X					
AS	23	NPA				X	X					

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
	11	NPA				X	X					
	29	NPA				X	X					
YPKG KALGOOLIE/					X			X				
Kalgoorlie	11	NPA				X	X					
AS	29	NPA				X	X					
	18	NPA				X	X					
	36	NPA				X	X					
YMLT LAUNCETON/					X			X				
Launceston	14L	ninst				X	X					
AS	32R	ninst				X	X					
	14R	NPA				X	X					
	32L	PA1				X	X					
	18	ninst				X	X					
	36	ninst				X	X					
YBRK ROCKHAMPTON/					X			X				
Rockhampton	04	NPA				X	X					
AS	22	NPA				X	X					
	15	NPA				X	X					
	33	NPA				X	X					
YPTN TINDAL/					X			X				
Katherine	14	NPA				X	X					
AS	32	NPA				X	X					
YHID HORN ISLAND/					X			X				
Horn Island	08	NPA				X	X					
RGS	26	NPA				X	X					
	14	NPA				X	X					
	32	NPA				X	X					
YSNF NORFOLK ISLAND/					X			X				NZZO FIR
Norfolk Island	04	PA1				X	X					
RS	22	NPA				X	X					
	11	PA1				X	X					
	29	PA1				X	X					
YPXM CHRISTMAS ISLAND/					X			X				
Christmas Island	18	NPA				X	X					
RS	36	NPA				X	X					
YPCC KEELING/					X			X				
Cocos Island Intl	15	NPA				X	X					
RS	33	NPA				X	X					
<b>BANGLADESH</b>			X	X						X	X	
VGZR DHAKA/					X			X				
Zia Int'l	14	PAI				X	X		*			* Not yet decided
RS	32	NPA				X	X					
VGEG CHITTAGONG/					X			X				
M.A. Hannan Intl	05	NPA				X			*			* Not yet decided
RS	23	PA1				X	X					

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>VGSY SYLHET/</b>					X			X				
Osmani Intl	11	PA1				X	X		*			* Not yet decided
RS	29	NPA				X	X					
<b>BHUTAN</b>												
<b>VQPR PARO/</b>												
	15											
	33											
<b>BRUNEI DARUSSALAM</b>												WBFC FIR
<b>WBSB BRUNEI/</b>					X			X			X	
Brunei Intl	03	PA1				X	X					
	21	PA1				X	X					
<b>CAMBODIA</b>												
<b>CHINA</b>			X	X								Sanya AOR only
<b>HONG KONG, China</b>			X	X					X	X		
<b>VHHH HONG KONG/</b>					X			X	X			
Hong Kong Intl	07L	PA2				X	X		X			
RS	07R	PA2				X	X		X			
	25L	PA2				X	X		X			
	25R	PA3				X	X		X			
<b>MACAO, China</b>												VHHK FIR
<b>VMMC MACAU/</b>					X			X			X	
Macau Intl	16	NPA				X	X		X			
	34	PA2				X	X		X			
<b>COOK ISLANDS</b>												
<b>DPR KOREA</b>												
<b>FIJI</b>			X	X						X	X	
<b>NFFN NADI/</b>					X			X				
Nadi Intl	02	PA1				X	X		X			
RS	20	PA1				X	X		X			
	09	NINST				X	X		X			
	27	NINST				X	X		X			
<b>NFSU SUVA/</b>					X			X				

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1	2	3	4	5	6	7	8	9	10	11	12	13
Nausori Intl	10	NPA				X	X		X			
RS	28	NPA				X	X		X			
<b>FRENCH POLYNESIA (FRANCE)</b>			2003	2003						2003	2003	
NTAA TAHITI/								X				
Faaa	04	PA1				2003	X		X			
RS	22	NPA				2003	X	X	X			
NTTB BORA BORA/												
Moto-Mute	11	NPA				2003	X	2003	X			
	29	NPA				2003	X	2003	X			
NTTR RAIATEA												
Utoroa	07	NPA				2003	X	2003				
	25	NPA				2003	X	2003				
NTTG RANGIGORA												
Rangigora	09	NPA				2003	X	2003				
AS	27	NPA				2003	X	2003				
<b>NEW CALEDONIA (FRANCE)</b>			X	X						2001	X	NFFF FIR
NWWW Noumea/					X			X				
La Tontouta	11	PA1				X	X		X			
RS	29	NINST				X	X		X			
<b>WALLIS ISLANDS (FRANCE)</b>												NFFF FIR
NLWW Wallis/												
Hihifo										2001	X	
RS	08	NPA				X	X					
	26	NPA				X	X					
<b>INDIA</b>			X	X							X	
VIDP DELHI/					X			X				
Indian Gandhi Intl	09	NPA				X	X					
RS	27	PA1				X	X					
	10	PA1				X	X					
	28	PA2				X	X					
VABB MUMBAI/					X			X				
ChhatrapatiShivaji Intl	09	PA1				X	X					
RS	27	PA1				X	X					
	14	PA1				X	X					
	32	NPA				X	X					
VOMM CHENNAI/					X			X				
Madras	07	PA1				X	X					
RS	25	NPA				X	X					
	12	NPA				X	X					
	30	NPA				X	X					
VECC KOLKATA/					X			X				
Netaji Subash	19L	PA1				X	X					
Chandra Bose Intl	01R	PA1				X	X					
RS	19R	NPA				X	X					
	01L	PA2				X	X					

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
VAAH AHMEDABAD/					X			X				
Sardar VallabhBhai	05	NPA				X	X					
Patel Intl	23	PA1				X	X					
RS												
VIAR AMRITSAR/					X			X				
Amritsar	16	NPA				X	X					
RS	34	PA1				X	X					
VOBG BANGALORE/					X			X				
Bangalore	09	NPA				X	X					
RS	27	PA1				X	X					
VOCI COCHIN/					X			X				
Cochin Intl	09	NPA				X	X					
RS	27	PA1				X	X					
VAGO GOA/					X							
Goa	08	NPA				X	X					
RS	26	NPA				X	X					
VEGT GUWAHATI/					X			X				
Lokapriya Gopinath	02	PA1				X	X					
Bardoloi Intl	20	NPA				X	X					
RS												
VOHY HYDERABAD/					X			X				
Rajiv Gandhi Intl	09	NPA				X	X					
RS	27	PA1				X	X					
VOTV TRIVANDRUM/					X			X				
Thiruvananthapuram	14	NPA				X	X					
Intl	32	PA1				X	X					
RS												
Note: Transformation into WGS-84 has been done by mathematical means using MADRAN software developed by NIMA (National Imaginary and Mapping Agency), USA												
<b>INDONESIA</b>			2002	X					X	2001		
WAPP AMBON/					2002			X				
Pattimura	04	NPA				X	X					
RNS	22	PA1				X	X					
WRLL BALIKPAPAN/					2002			X				
Sepinggan	07	NPA				X	X					
RS	25	PA1				X	X					
WRBB BANJARMASIN/					2002			X				
Syamsudin Noor	10	PA1				X	X					
AS	28	NPA				X	X					
WIKB BATAM/					2002			X				
Hang Nadim	04	PA1				X	X					
RS	22	NPA				X	X					
WABB BIAK/					2002			X				
Frans Kaisiepo	11	PA1					X					
RS	29	NPA					X					
WRRR DENPASAR/					2002			X				

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
Ngurah Rai	09	NPA				X	X					
RS	27	PA1				X	X					
WIII JAKARTA/ HalimPerdanakusuma	06	NPA			2002			X				
RNS	24	PA1					X					
WIIH JAKARTA/ Soekarno-Hatta	07L	PA1			2002			X				
RS	25L	PA1				X	X					
	07R	PA1				X	X					
	25R	PA1				X	X					
WAJJ JAYAPURA/ Sentani	12	NPA			2002			X				
RS	30	PA1				X	X					
WRKK KUPANG/ El Tari	07	NPA			2002			X				
RS	25	PA1					X					
WAAA MAKASSAR/ Hasanuddin	13	PA1			2002			X				
RNS	31	NPA				X	X					
WAMM MANADO/ Sam Ratulangi	18	PA1			2002			X				
RS	36	NPA				X	X					
WIMM MEDAN/ Polonia	05	PA1			2002			X				
RS	23	NPA				X	X					
WAKK MERAUKE/ Mopah	16	NPA			2002			X				
RNS	34	NINST				X	X					
WIMG PADANG/ Tabing	16	NINST			2002			X				
RS	34	NINST				X	X					
WIPP PALEMBANG/ SM Badaruddin II	11	NPA			2002			X				
RNS	29	PA1				X	X					
WIBB PEKANBARU/ SultanSyarifKasim II	18	NPA			2002			X				
RNS	34	PA1				X	X					
WIOO PONTIANAK/ Supadio	15	PA1			2002			X				
RS	33	NPA				X	X					
WRSJ SURABAYA/ Juanda	10	PA1			2002			X				
RS	28	NPA				X	X					
WIKN TANJUNG PINANG/ Kiang	04	NPA			2002			X				

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
RNS	22	NINST				X	X					
WRLR TARAKAN/ Juwata	06	NPA			2002	X	X	X				
RS	24	NINST				X	X					
WABP TIMIKA/ Tembaga Pura	12	NPA			2002		X	X				
RS	30	NPA					X					
WIJJ YOGYAKARTA/ Adi Sucipto	09	NPA			2002		X	X				
RNS	27						X					
* The WGS-84 was implemented in almost all International Airport in Indonesia including the NPA with overlay ** The Ground Undulation (Diference between Mean Sea Level and Elipsoit) will be started in the Year 2002												
<b>JAPAN</b>			2002	X							2002	
RJFF FUKUOKA/ Fukuoka					2002			X				
RS	16	PA1				X	X					
	34	NPA				X	X					
RJCH HAKODATE/ Hakodate					2002			X				
RS	12	PA1				X	X					
	30	NPA				X	X					
RJFK KAGOSHIMA/ Kagoshima					2002			X				
RS	16	NPA				X	X					
	34	PA1				X	X					
RJBB OSAKA/ Kansai Intl					2002			X				
RS	06	PA2				X	X					
	24	NPA				X	X					
RJFT KUMAMOTO/ Kumamoto					2002			X				
RS	07	PA3				X	X					
	25	NPA				X	X					
RJFU NAGASAKI/ Nagasaki					2002			X				
RS	14	NPA				X	X					
	32	PA1				X	X					
	18	NPA				X	X					
	36	NPA				X	X					
RJNN NAGOYA/ Nagoya					2002			X				
RS	16	NPA				X	X					
	34	PA1				X	X					
ROAH NAHA/ Naha					2002			X				
RS	18	NPA				X	X					

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1	2	3	4	5	6	7	8	9	10	11	12	13
	36	PA1				X	X					
RJCC SAPPORO/ New Chitose					2002			X				
RS	01L	PA1				X	X					
	19R	NPA				X	X					
	01R	PA1				X	X					
	19L	NPA				X	X					
RJAA TOKYO/ New Tokyo Intl					2002			X				
RS	16	PA3				X	X					
	34	NPA				X	X					
RJSN NIIGATA/ Niigata					2002			X				
RS	04	NPA				X	X					
	22	NPA				X	X					
	10	NPA				X	X					
	28	PA1				X	X					
RJOO OSAKA/ Osaka Intl					2002			X				
RS	14R	NPA				X	X					
	32L	PA1				X	X					
	14L	NPA				X	X					
	32R	NPA				X	X					
RJSS SENDAI/ Sendai					2002			X				
RS	09	NPA				X	X					
	27	PA1				X	X					
	12	NPA				X	X					
	30	NPA				X	X					
RJTT TOKYO/ Tokyo Intl					2002			X				
RS	16L	NPA				X	X					
	34R	PA2				X	X					
	16R	NPA				X	X					
	34L	PA1				X	X					
	04	NPA				X	X					
	22	PA1				X	X					
<b>KIRIBATI</b>												NFFF FIR
<b>LAO PDR</b>												

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>MALAYSIA</b>			X	X							X	
WMKA ALOR SETAR/					X			X				
Sultan Abdul Halim	04	NPA					X					
RS	22	NINST					X					
WMKB BUTTERWORTH/					X			X				
Butterworth	18	NPA					X					
RS	36	NPA					X					
WMKC KOTA BHARU/					X			X				
Sultan Ismail Petra	10	NPA					X					
RS	28	NPA					X					
WMKD KUANTAN/					X			X				
Kuantan	18	NPA					X					
RS	36	PA1					X					
WMKE KERTEH/					X			X				
Kerteh	16	NPA					X					
RS	34	NPA					X					
WMKF KUALA LUMPUR/					X			X				
Simpang	04	NINST					X					
RS	22	NINST					X					
WMKI IPOH/					X			X				
Sultan Azlan Shah	04	PA1					X					
RS	22	NINST					X					
WMKJ JOHOR BAHRU/					X			X				
Sultan Ismail	16	PA1					X					
RS	34	NPA					X					
WMKK KUALA LUMPUR/					X			X				
Sepang Intl	14R	PA1				X	X					
RS	32L	PA1				X	X					
	14L	PA1				X	X					
	32R	PA1				X	X					
WMKL LANGKAWI/					X			X				
Langkawi Intl	03	PA1					X					
RS	21						X					
WMKM MALACCA/					X			X				
Malacca	03	NPA					X					
RS	21	NPA					X					
WMKN KUALA TERENGGANU/					X			X				
Sultan Mahmud Shah	04	NPA					X					
RS	22	NPA					X					
WMKP PENANG/					X			X				
Penang Intl	04	PA1					X					
RS	22	NPA					X					
WMSA KUALA LUMPUR/					X			X				
Sultan AbdulAzizShah	15	PA1					X					

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1	2	3	4	5	6	7	8	9	10	11	12	13
RS	33	PA1					X					
WMBT PULAU TIOMAN/								X				
Pulau Tioman	02						X					
RS	20	NINST					X					
WMPA PULAU PANGKOR/								X				
Pulau Pangkor	04						X					
RS	22	NINST					X					
WMAP KLUANG/								X				
Kluang	05	NINST										
RS	23	NINST										
WBGB BINTULU/					X			X				
Bintulu	12	NPA					X					
RS	30	NINST					X					
WBGK KUCHING/					X			X				
Kuching Intl	07	NPA					X					
RS	25	PA1					X					
WBGR MIRI/					X			X				
Miri	02	PA1					X					
RS	20	NPA					X					
WBGK SIBU/					X			X				
Sibu	13	PA1					X					
RS	31	NPA					X					
WBKD LAHAD DATU/					X			X				
Lahad Datu	11	NINST					X					
RS	29	NPA					X					
WBKK KOTA KINABALU/					X			X				
Kota Kinabalu Intl	02	PA1					X					
RS	20	NPA					X					
WBKL LABUAN/					X			X				
Labuan	14	NPA					X					
RS	32	NPA					X					
WBKS SANDAKAN/					X			X				
Sandakan	08	PA1					X					
RS	26	NPA					X					
WBKW TAWAU/					X			X				
Tawau	17	NINST					X					
RS	35	NPA					X					
<b>MALDIVES</b>			X	X						X		
VRMM MALE/					X			X				
Male Intl	18	PA1				X	X		X			
RS	36	NPA					X					
<b>MARSHALL IS.</b>												KZOK FIR

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CITY/AERODROME	RWY No	RWY TYPE	FIR	ENR	TMA/CTA/CTZ	APP	RWY	AD/HEL	GUND	QUALITY SYSTEM	AIP	
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>MICRONESIA, FS</b>												KZOK FIR
<b>MONGOLIA</b>												
			X	X						2002	X	
ZMUB ULAN BATOR/					X			X				
Byant-Ukkaa	14	NPA				X	X					
	32	NPA				X	X					
RS												
<b>MYANMAR</b>												
<b>NAURU</b>												
<b>NEPAL</b>												
				X						X	X	
VNKT KATHMANDU					X			X				
Tribhuvan Intl	02	NPA				X	X					
RS	20	NINST					X					
<b>NEW ZEALAND</b>												
			X	X						X	X	
NZAA AUCKLAND/					X			X				
Auckland Intl	05	PA1				X	X		X			
RS	23	PA1			X	X	X		X			
NZWN WELLINGTON/					X			X				
Wellington	16	PA1				X	X		X			
RS	34	PA1				X	X		X			
ZCH CHRISTCHURCH/					X			X				
Christchurch	02	PA1				X	X		X			
RS	20	PA1				X	X		X			
NZNS NELSON/					X			X				
Nelson	02	NPA				X	X		X			
RS	20	NPA				X	X		X			
NZDN DUNEDIN/					X			X				
Dunedin	03	PA1				X	X		X			
RS	21	PA1				X	X		X			
NAPM PALMERSTON/					X			X				
Palmerston North	07	NPA				X	X		X			
RNS	25	NPA				X	X		X			
NZHN HAMILTON/					X			X				

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1	2	3	4	5	6	7	8	9	10	11	12	13
Hamilton	18	NPA				X	X		X			
RNS	36	NPA				X	X		X			
NZQN QUEENSTOWN/					X			X				
Queenstown	05	NPA				X	X		X			
RNS	23	NPA				X	X		X			
NZWP WHENUAPAI/					X			X				
Whenuapai (Mil)	03	PA1				X	X		X			
RNS	21	PA1				X	X		X			
NZOH OHAKEA					X			X				
Ohakea (Mil)	09	PA1				X	X		X			
AS	27	PA1				X	X		X			
<b>NIUE ISLAND (New Zealand)</b>												NZZO FIR
NIUE ALOF/												
Niue Intl												
RS												
<b>PAKISTAN</b>			X	X						X	X	
OPFA FAISALABAD/					X			X				
Faisalabad	03	PA1				X	X		X			
RS	21	NPA										
OPGD GWADAR/					X			X				
Gwadar	06	NINST				X	X		X			
RS	24	NPA										
OPRN ISLAMABAD/					X			X				
Chaklala	12	NINST				X	X		X			
RS	30	PA1										
OPKC KARACHI/					X			X				
Quaid-e-Azam Intl	07	NINST				X	X		X			
RS	25	PA1										
OPLA LAHORE/					X			X				
Lahore	18	NPA				X	X		X			
RS	36	PA2										
OPMT MULTAN/					X			X				
Multan	18	NPA				X	X		X			
RS	36	PA1										
OPNH NAWABSHAH/					X			X				
Nawabshah	02	NPA				X	X		X			
AS	20	NPA										
OPPS PESHAWAR/					X			X				
Peshawar	17	NPA				X	X		X			
RS	35	NPA										
OPTU TURBAT/					X			X				
Turbat	08	NPA				X	X		X			
RS	26	NPA										
<b>PALAU</b>												KZOK FIR

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1	2	3	4	5	6	7	8	9	10	11	12	13
<b>PAPUA NEW GUINEA</b>												
Note: All Nav aids coordinates using WGS-84 datum FLT SUP COM 2-1 to 2-7												
<b>PHILIPPINES</b>												
RPLL MANILA/			08/2001	08/2001							08/2001	
Ninoy Aquino Intl	06	PA1			08/2001		08/2001	08/2001				ATO-NIMA survey
RS	24	PA1					08/2001	08/2001				
	13	NINST					08/2001	08/2001				
	31	NINST					08/2001	08/2001				
RPLB SUBIC BAY/					08/2001						08/2001	ATO-NIMA survey
Subic Bay Intl	07R	NPA					08/2001	08/2001				
RS	25L	(S Cat1)					08/2001	08/2001				
	07L	NINST					08/2001	08/2001				
	25R	NINST					08/2001	08/2001				
RPMD DAVAO/					08/2001						08/2001	Old survey (ATO-NIMA survey on-going)
Francisco Bangol Intl	05	NPA					08/2001	08/2001				
AS	23	NPA					08/2001	08/2001				
RPLI LAOAG/					08/2001						08/2001	Old survey (ATO-NIMA survey on-going)
Laoag Intl	05	NPA					08/2001	08/2001				
AS	23	NPA					08/2001	08/2001				
RPVM LAPU-LAPU/					08/2001						08/2001	ATO-NIMA survey
Mactan Cebu Intl	04	PA1					08/2001	08/2001				
RS	22	PA1					08/2001	08/2001				
RPLC PAMPANGA/					08/2001						08/2001	ATO-NIMA survey
Clark Intl	02R	PA1					08/2001	08/2001				
RS	20L	PA1					08/2001	08/2001				
	02L	NINST					08/2001	08/2001				
	20R	NINST					08/2001	08/2001				
RPMZ ZAMBOANGA/					08/2001						08/2001	Old survey (ATO-NIMA survey on-going)
Zamboanga Intl	09	PA1					08/2001	08/2001				
AS	27	PA1					08/2001	08/2001				
<b>REP OF KOREA</b>												
RKSI INCHEON/			X	X	X			X			X	X
Incheon Intl	15R	PA3				X	X		X			
RS	15L	PA3				X	X		X			
	33R	PA3				X	X		X			
	33L	PA3				X	X		X			
RKSS GIMPO/					X			X				
Gimpo Intl	14R	PA2				X	X		X			
RS	32L	NPA				X	X		X			
	14L	PA1				X	X		X			
	32R	PA1				X	X		X			
RKPK BUSAN/					X			X				

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1	2	3	4	5	6	7	8	9	10	11	12	13
Gimhae Intl	18L	NPA				X	X		X			
RS	36R	PA1				X	X		X			
	18R	NPA				X	X		X			
	36L	PA1				X	X		X			
RKPC JEJU/					X			X				
Jeju Intl	6	PA1				X	X		X			
RS	24	PA1				X	X		X			
	31	NINST				X	X		X			
	13	NINST				X	X		X			
RKTU CHEONG/					X			X				
Cheongju	06L	PA1				X	X		X			
RNS/AS	24R	PA1				X	X		X			
	06R	NINST				X	X		X			
	24L	NINST				X	X		X			
RKJJ GWANGJU/					X			X				
Gwangju	4	PA1				X	X		X			
RNS/AS	22	NPA				X	X		X			
RKTN DAEGU/					X			X				
Daegu	31	PA1				X	X		X			
RNS/AS	13	NPA				X	X		X			
RKNN GANGNEUNG/					X			X				
Gangneung	26	NPA				X	X		X			
RNS/AS	8	NINST				X	X		X			
RKTH POHANG/					X			X				
Pohang	10	NPA				X	X		X			
AS	28	NPA				X	X		X			
RKTY YECHEON/					X			X				
Yecheon	28	PA1				X	X		X			
AS	10	NPA				X	X		X			
<b>SAMOA</b>											X	NFFF FIR
NSFA FALEOLO/					X			X				
Faleolo Intl	08	PA1				X	X		X	X		
RS	26	NPA				X	X		X	X		
NSFI FAGALII/												
Fagalii	10											
RG	28	NINST										
NSMA MAOTA/												
Maota	08											
RG	26	NINST										
NSAU ASAU/												
Asau	08											
RG	26	NINST										
<b>SINGAPORE</b>			X	X						X	X	
WSSS SINGAPORE/					X			X				
Changi Intl	02L	PA2				X	X		X			

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1	2	3	4	5	6	7	8	9	10	11	12	13
RS	20R	PA1				X	X		X			
	02R	PA1				X	X		X			
	20L	PA2				X	X		X			
WSSL SINGAPORE/ Seletar	03	NINST			X		X		X		X	
RG	21	NINST					X		X			
WSAP SINGAPORE/ Paya Lebar	02	NPA			X	X	X				X	
AS	20	NPA				X	X					
<b>SOLOMON ISLANDS</b>												
<b>SRI LANKA</b>			X	X							X	
COLOMBO/ Bandaranaike Intl	22	PA1			X	X	X			X	X	AIP Supplement
RNS	04	PA1				X					X	
<b>THAILAND</b>												
			2001	2001							2002	
VTSE CHUMPHON/ Chumphon					2001			X				
RG	06	NPA					X		X			
	24	NPA					X		X			
VTPH PRACHUAP KHIRI KHAN/ Hua Hin								X				
RG	16	NPA					X		X			
	34	NINST					X		X			
VTUK KHON KAEN/ Khon Kaen	03	NPA					X		X			
RNS	21	NPA					X		X			
VTSG KRABI/ RNS	14	NPA					X		X			
	32	NPA					X		X			
VTUQ NAKHON RATCHASIMA/ Nakhon Ratchasima								X				
RG	06	NPA					X		X			
	24	NPA					X		X			
VTCN NAN/ Nan								X				
RNS	02	NPA					X		X			
	20	NPA					X		X			
VTSC NARATHIWAT/ Narathiwat								X				
RG	02	PA1					X		X			
	20	NPA					X		X			

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1	2	3	4	5	6	7	8	9	10	11	12	13
VTSK PATTANI/								X				
Pattani												
RG	08	NPA					X		X			
	26						X		X			
VTTP PHITSANULOK/								X				
Phitsanulok	14	NPA					X		X			
RS	32	PA1					X		X			
VTSR RANONG/								X				
Ranong												
RG	02	PA1					X		X			
	20						X		X			
VTSB SURAT THANI/								X				
Surat Thani	04	NPA					X		X			
RNS	22	PA1					X		X			
VTST TRANG/								X				
Trang												
RG	08	NPA					X		X			
	26						X		X			
VTUU UBON RATCHATHANI/								X				
Ubon Ratchathani	05	NPA					X		X			
RS	23	PA1					X		X			
VTUD UDONTHANI/								X				
Udon Thani												
RNS	12	NPA					X		X			
	30	PA1					X		X			
VTSM SURATHANI/					X			X				
Samui												
RS	17	NPA				X	X		X		X	
	35	NPA				X	X					
VTPO SUKHOTHAI/					X			X				
Sukhothai												
RS	18	NPA				X	X		X		X	
	36	NPA				X	X					
VTCC CHIANG MAI/												
Chiang Mai Intl	18	NPA			2001	X	X	X				
RS	36	PA1										
VTSS SONG KHLA/												
Hat Yai Intl	08	NPA			2001	X	X	X				
RS	26	PA1										
VTSP PHUKET/	09	NPA			2001	X	X	X				
Phuket												
RS	27	PA1										
VTCT CHIANG RAI/												
Chiangrai Intl	03	PA1			2001	X	X	X				
RS	21	NPA										

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1	2	3	4	5	6	7	8	9	10	11	12	13
<b>VTBU RAYONG/</b>												
Ban U-Taphao	18	PA1			2001	X	X	X				
AS	36	NPA										
<b>VTBD BANGKOK/</b>												
Bangkok Intl	03R	NPA				X	X					
RS	03L	PA1				X	X					
	21R	NPA					X		X			
	21L	PA1					X		X			
<b>TONGA</b>												
			X	X						X	X	NFFF FIR
<b>NFTF FUA'AMOTU/</b>												
Fua'amotu Intl	11	NPA			X			X				
RS	29	NPA				X	X		X			
	17	NINST				X	X		X			
	35	NINST				X	X		X			
<b>TUVALU</b>												
												NZZO FIR
<b>UNITED STATES</b>												
			X	X						X	X	
<b>PANC ANCHORAGE/</b>												
Anchorage Intl	14	NPA			X			X				
RS	32	NINST				X	X		X			
	6L	PA1				X	X		X			
	24R	NINST				X	X		X			
	6R	PA3				X	X		X			
	24L	NINST					X		X			
<b>PAED ANCHORAGE/</b>												
Elmendorf AFB	5	PA1				X	X		X	X	X	
AS	23	NINST										
	15	NINST										
	33	NINST										
<b>PACD COLD BAY/</b>												
Coldbay	14	NPA				X	X		X			
AS	32	NPA										
	26	NINST										
<b>KPAE EVERETT/</b>												
Paine Field	34L	NPA			X			X				
AS	16R	PA2				X	X		X			
	11	NINST										
	29	NINST										
	34R	NINST										
	16L	NINST										
<b>PAEI FAIRBANKS/</b>												
Eielson AFB	13	PA1				X	X		X			
AS	31	PA1				X	X		X			
<b>PAFA FAIRBANKS/</b>												
Fairbanks Intl	19R	PA1				X	X		X			
RS	01L	PA3				X	X		X			

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1	2	3	4	5	6	7	8	9	10	11	12	13
	19L	NINST										
	01R	NINST										
KFAT FRESNO/					X			X				
Yosemite Intl	29R	PA3				X	X		X			
AS	11L	NPA										
	29L	NINST										
	11R	NINST										
PHTO HILO/					X			X				
General Lyman Field	03	NINST				X	X		X			
AS	21	NINST										
	26	PA1				X	X		X			
	08	NINST										
PHNA HONOLULU/												
Barbers Point	04R	NPA										No WGS-84
AS	22L	NINST										data available
PHNL HONOLULU/					X			X				
Honolulu Intl	8L	PA1				X	X		X			
INTL	26R	NINST										
RS	04L	NINST										
	22R	NINST										
	04R	PA1										
	22L	NINST										
	26L	PA1				X	X		X			
	8R	NINST										
PHOG KAHULUI/												
Kahului	32	NINST			X			X				
AS	02	PA1				X	X		X			
	20	NPA				X	X		X			
KLAX LOS ANGELES/					X			X				
Los Angeles Intl	06L	PA1				X	X		X			
RS	24R	PA3				X	X		X			
	6R	PA1				X	X		X			
	24L	PA1				X	X		X			
	07L	PA1				X	X		X			
	25R	PA1				X	X		X			
	07R	PA1				X	X		X			
	25L	PA3				X	X		X			
KOAK OAKLAND/					X			X				
Oakland Metropolitan	11	PA1				X	X		X			
AS	29	PA3										
	09R	NPA										
	27L	NPA										
	09L	NPA										
	27R	NPA										
KONT ONTARIO/					X			X				

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1	2	3	4	5	6	7	8	9	10	11	12	13
Ontario Intl	26R	PA1				X	X		X			
AS	08L	PA1				X	X		X			
	26L	PA3				X	X		X			
	08R	NPA				X	X		X			
KPMD PALMDALE/					X			X				
Palmdale	22	NPA										
AS	25	PA1				X	X		X			
	07	NPA				X	X		X			
KPDX PORTLAND/					X			X				
Portland Intl	03	NINST				X	X		X			
AS	21	NPA				X	X		X			
	10R	PA3				X	X		X			
	28L	NPA				X	X		X			
	10L	PA2				X	X		X			
	28R	NPA				X	X		X			
KSMF SACRAMENTO/					X			X				
Metropolitan	16R	PA3				X	X		X			
AS	34L	PA1				X	X		X			
	16L	PA1				X	X		X			
	34R	NPA				X	X		X			
	16L	NPA				X	X		X			
KSFO SAN FRANCISCO/					X			X	X			
San Francisco Intl	10L	NINST										
RS	28R	PA3				X	X		X			
	10R	NINST					X					
	28L	PA1				X	X		X			
	01L	NINST					X					
	19R	NINST					X					
	01R	NINST					X					
	19L	PA1				X	X					
KSJC SAN JOSE/					X				X			
San Jose Intl	12R	PA1				X	X	X				
RS	30L											
	12L	NPA										
	30R											
	29	NINST										
KBFI SEATTLE/					X			X				
Tacoma Intl	13R	PA1				X	X		X			
RS	31L	PA1				X	X		X			
	13L	NINST				X	X		X			
	31R	NINST										
KGEG SPOKANE/					X			X			X	
Spokane Intl	25	NPA				X	X		X		X	
AS	07	NINST				X	X					
	21	PA2				X	X					

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1	2	3	4	5	6	7	8	9	10	11	12	13
	03	PA3				X	X					
<b>KSCK STOCKTON/</b>												
Metropolitan	11L	PA1			X	X	X	X	X			
AS	29R	NINST										
<b>AMERICAN SAMOA (United States)</b>												NFFF FIR
<b>NSTU PAGO PAGO/</b>												
Pago Pago Intl												
RS												
<b>GUAM ISLAND (United States)</b>												KZOK FIR
<b>PGUM GUAM/</b>												
Agana												
RS												
<b>PGUA GUAM ISLAND/</b>												
Andersen												
AS												
<b>JOHNSTON ISLAND (United States)</b>												KZOK FIR
<b>PJON JOHNSTON ISLAND/</b>												
Johnston Atoll												
RS												
<b>NORTHERN MARIANA ISLANDS (United States)</b>												KZOK FIR
<b>PGSN SAIPAN/</b>												
Saipan Intl												
RS												
<b>VANUATU</b>												NFFF FIR
<b>VIET NAM</b>			X	X							X	
<b>VVNB HANOI/</b>					X							
Noi Bai Intl	11	PA1				X	X		X			
RS	29	NPA				X	X		X			
<b>VVDN DANANG/</b>					X							
Da Nang Intl	17L	NPA				X	X		X			
RS	35R	PA1				X	X		X			
	35L	NPA				X	X		X			
	17R	NPA				X	X		X			
<b>VVTS HO CHI MINH/</b>					X							
Tan Son Nhat Intl	07R	NPA				X	X		X			
RS	07L	NPA				X	X		X			
	25R	PA1				X	X		X			
	25L	NPA				X	X		X			

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**Key Priorities for CNS/ATM Implementation in the Asia Pacific Region**

<b>Key Priority</b>	<b>Description</b>	<b>Milestone</b>	<b>Sub-group</b>	<b>Status</b>
ATN Transition	The development of an ATN transition plan is required.	2001	CNS/MET  ATN Transition Task Force	<del>Under review</del> <b>Completed</b>  Completed development of the Plan
Incorporation of CNS/ATM Material into Regional ANP & FASID	To reflect regional agreement for the implementation of CNS/ATM facilities and services and the determination of priorities for financing.	APANPIRG/12	All	On-going <b>CNS/MET SG/5 established Working Group to incorporate CNS/ATM materials in the Regional Procedure Part CNS FASID.</b>
Revised South China Sea ATS Route Implementation	Successful implementation of this important route structure alleviates airspace congestion and provides a project model for similar route structure activity elsewhere in the Region.	<del>Immediate</del> <del>1 November</del> <del>2001</del>	ATS/AIS/SAR	<del>Recent meetings between China and Viet Nam under ICAO auspices have taken place to explore proposals.</del> Implementation project has been progressed through the ICAO South China Sea Route Implementation Task Force.
WGS-84 Implementation	To achieve uniformity in aeronautical data publication across the Region in order to ensure a standard reference system for CNS/ATM.	Immediate (Effective Date was 1 Jan 1998)	ATS/AIS/SAR	Implementation is monitored at each meeting using the uniform format for the reporting of WGS-84 implementation. Report progress to APANPIRG/12.

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Key Priority	Description	Milestone	Sub-group	Status
RVSM Implementation	To provide more efficient flight profiles and to increase airspace capacity in conjunction with the implementation of CNS/ATM.	21 Feb 2002 – Western Pacific/South China Sea 31 Oct 2002- Hong Kong FIR and Sanya AOR 27 Nov 2003- Asia to Europe South of the Himalayas Australia Nov 1	ATS/AIS/SAR	Phased implementation. RVSM Implemented in the Pacific 24 Feb 2000.
RNP Implementation	Global standard for navigation is seen as a prerequisite for many CNS/ATM implementation activities.	RNP-10/South China Sea 2001 RNP-10/ Australia-Indonesia Nov 2001 RNP-10/Bay of Bengal 2002	ATS/AIS/SAR & CNS/ATM/IC	Phased implementation. RNP-10 is implemented in NOPAC, CENPAC, CEP & Tasman Sea.
ADS	The implementation of ADS in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM.	APANPIRG/12	ATS/AIS/SAR	Phased implementation. Revised Regional CNS/ATM Guidance Material developed containing ADS section. Implementation focus and timetable need to be developed. ANC/Council review indicates that CNS/ATM/GM shall not include ADS section. States are gaining experience in the use of ADS.

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Key Priority	Description	Milestone	Sub-group	Status
Technical Co-operation in Regional CNS/ATM Planning & Implementation	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.	APANPIRG/12	All	Sub-groups to identify requirements.
Preparation for WRC2003	The co-operative participation of States is required with their respective communications authority, regional groups such as the APT and at the WRC, preparatory meetings and study groups to ensure that aviation spectrum requirements are fulfilled including GNSS spectrum requirements.	WRC2003	All	ICAO Position presented at APT meetings in Sept.2000 and June 2001. State letter issued to follow up APANPIRG Conclusion 11/24, A Seminar on spectrum management will be held in conjunction with AMCP WG-F meeting in November 2001 in Bangkok.

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Key Priority	Description	Milestone	Sub-group	Status
GNSS Implementation	To implement GNSS in accordance with the Asia Pacific Regional Strategy.	Phase 1 – 2002 2003	All	Phased implementation Sub-groups to develop plan and report progress to APANPIRG/42 13 <ul style="list-style-type: none"> <li>• GNSS Implementation Workshop was held in May 2001.</li> <li>• States are encouraged to implement GNSS for En-route and NPA functions.</li> <li>• States advised to participate in the GNSS Measurement Campaign.</li> <li>• GNSS Implementation checklist was developed.</li> <li>• GNSS strategy was reviewed.</li> </ul>
Airspace Management	To implement revised ATS route structures for the major traffic flows.	Phase 1 – Asia to Europe via South of the Himalayas, July Nov 2002	ATS/AIS/SAR CNS/MET	Phased implementation. Report progress to APANPIRG/12.

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Key Priority	Description	Milestone	Sub-group	Status
Final phase of WAFS	To implement transition to the final phase of WAFS to support the CNS/ATM system.	2004	CNS/MET SG	<ul style="list-style-type: none"> <li>• WAFS Transition Plan and Procedures has been developed and is being successfully implemented.</li> <li>• Transfer of responsibility of RAFCs to WAFCs London and Washington has been implemented.</li> <li>• Closure of RAFCs has been implemented.</li> </ul>
MET Chapter 8 of the ASIA/PAC Regional Plan for New CNS/ATM System	<p>To develop MET components of the ASIA/PAC CNS/ATM concept/strategy</p> <p>To develop MET Chapter of the Regional CNS/ATM Plan</p>	<p>2003</p> <p>2004</p>	CNS/MET with assistance of the ATS/AIS/SAR SG METATM TF	<ul style="list-style-type: none"> <li>• The first draft of MET Chapter of the Regional CNS/ATM Plan has been developed.</li> <li>• METATM TF to develop MET components of the ASIA/PAC CNS/ATM concept/strategy.</li> </ul>
Data – link Communications	<p>1. The implementation of CPDLC and/or SATCOM voice in the oceanic airspace where HF voice is used as a primary means.</p> <p>2. AIDC to be introduced where ATS automated systems are implemented.</p>	<p>2002</p> <p>2005</p>	<p>All</p> <p>All</p>	Sub – Groups to review progress of implementation.

**Agenda Item 5: Identify the need for and facilitate the development of business cases, including cost/benefit analyses, for the implementation of CNS/ATM systems within the Region**

**5.1 Business Case Task Force**

5.1.1 Two papers were presented to the meeting. The first paper related to CNS/ATM Implementation – The Case For An Holistic Approach, primarily dealt with upper airspace and achieving benefits for aircraft on long haul routes. IATA commented that it was equally applicable to lower level airspace and the same considerations should apply to new CNS/ATM systems, which would require States to look differently at route structures and management of airspace.

5.1.2 According to the information provided, it was identified that the realisation of the full potential of CNS/ATM Systems in the region was being constrained by airspace boundaries and the variation in implemented system capabilities in adjacent Flight Information Regions (FIRs). Further, it was considered that such constraints would only be removed by the adoption of a complete systems approach to CNS/ATM implementation. The current proposal for Business Case studies of individual systems in the regional FIRs, may lead to system fragmentation, ad-hoc implementation and unnecessary constraints. Attention was drawn to the point that strategic alliances, or partnerships, between States for the management of airspace may best serve the interests of individual States and needs of airline operators.

5.1.3 Additional information was provided related to the mechanics of the Business Case Approach. This included a critique of some of the assumptions in the Business Case Approach and highlighted a logical extension to it. Further, it was highlighted that a major step forward in the business case approach focused on the benefits to the user, and provided a means for formulating a basis for financing. Another step, the Partnership Approach, involved the establishment of partnerships between governments, commercial air navigation service providers and technology suppliers to develop the infrastructure and maintain the ATS system.

5.1.4 It was pointed out to the meeting that there was a major credibility issue in the Business Case Approach using any assumption based on savings from retiring existing infrastructure. History had shown that such savings were not always accrued as anticipated. In the case of New Zealand, for example, the meeting was advised that a Business Case was developed on the assumption that, if the FANS Package had been adopted by 60 per cent of the aircraft operating in the Auckland Oceanic FIR, this would enable a reduction in HF radio operational infrastructure and costs. Investment models were finalized in 1995 for the new oceanic system based on this assumption. In reality, only 20 per cent of the aircraft today were so equipped. Thus, the full HF infrastructure was required and no savings in this area was possible.

5.1.5 It was also highlighted that unless the costs of a CNS/ATM system were met solely by the State, it would be the users of the system who would ultimately pay. Therefore, they must be the starting point for any business case. Once users needs are established, the main issue becomes the funding of the investment. To achieve this funding, three alternatives were presented:

- a) State funding, where the funds are competed for;
- b) State guarantor – where the State carries the financial risk; and
- c) Private sector funding.

5.1.6 Under the private sector funding model, the State had no requirement to fund the development. Responsibility for funding infrastructure development was provided by a third party. The third party, in partnership with the users and the State, determined infrastructure requirements. The investment was then made by the third party who purchased and owned the assets required and leased them back to the State provider or, alternatively, owned and operated the service provision under a concession, with asset ownership reverting to the State at the end of the concession. The attraction of this model to States, was that access to funding ceased to be a State responsibility, and the business case risk was carried by a third party.

5.1.7 The meeting was advised that another very important factor was **expertise** in the implementation of CNS/ATM systems. To avoid stranded investment, it was essential that a “total package” and long term approach to system implementation be undertaken. This involved the vendor providing not only the system but also training, procedures, integration, etc.

5.1.8 The meeting noted the information above and recalled that APANPIRG/11 (paragraph 3.9.5 to the Report on Agenda Item 3 refers) addressed the subject of a business case approach in depth. In addition, this subject was comprehensively covered in the Global Air Navigation Plan for CNS/ATM Systems.

5.1.9 The meeting noted that the implementation planning process in the region for CNS/ATM Systems already included substantial documentation on the business case approach. The meeting also noted that it was timely and appropriate to emphasize the importance that States adopt a partnership approach for CNS/ATM systems implementation, and developed the following Draft Conclusion.

**Draft Conclusion 8/5 - Business Case Studies – Partnership Approach**

That, States, when considering the methodology for establishing a business case study, should consider a Partnership Approach between States, users, service providers and operators of State aircraft for the implementation of CNS/ATM systems to mitigate against financial and technical risks involved in implementing complicated systems.

**Agenda Item 6: Review requirements for Inter-Regional Co-ordination**

6.1 The meeting was advised that following on Recommendation 3/10 c) of ALLPIRG/3, the First Inter-Regional Co-ordination Meeting (IRCM/1), between Asia/Pacific, Middle East and the EUR/NAT Regional Offices, as well as the Regional Affairs Office at ICAO Headquarters, was held in Bangkok Regional Office from 11 to 13 October 2000.

**Development of a framework for inter-regional co-ordination (IRC) meetings**

6.2 The meeting noted that IRCM/1 discussed the development of an Inter Regional Co-ordination Framework (IRC-F). The purpose of the framework was to facilitate IRC between the respective air navigation regions, currently served by the seven Regional Offices of ICAO.

6.2.1 It was noted that as air navigation continues to evolve into an increasingly seamless systems infrastructure, IRC would form a vital activity in enhancing the pace of implementation. In the course of developing an Inter Regional Co-ordination Framework (IRC-F), it was agreed that care should be exercised so as not to create additional structured layers. Rather, maximum advantage should be taken of the current mechanisms in effecting IRC.

6.2.2 The meeting was advised that IRC should be more of a function than a structured body, therefore this function should be perceived, planned and executed on a need basis rather than making it a routine activity. IRC-F should focus on the management aspects of inter-regional activities, in terms of identifying, consolidating, re-distributing the tasks and carrying out a stringent follow-up on the progress.

6.2.3 The IRCM/1 considered a general overview of the flow of activities which would be a typical case between the various Regions, either two or more as the case may be. It was noted that the flow of activities would generally entail co-ordination inter-linkages at the level of ALLPIRG, PIRGs, and their contributory bodies, and very importantly, at the peer-to-peer level of the ICAO Secretariat inclusive of the Regional Directors. It was also agreed that all co-ordination activities shall take place with the full involvement of the respective ICAO Secretariat.

6.2.4 IRCM/1 agreed that flexibility was the mainstay of the IRC function and this flexibility was totally dependent on the needs identified by the various levels. The IRC Framework could eventually expand its scope by involving the relevant chairpersons and Secretariat of the various contributory bodies of the Regions. However, a further consolidation of the Framework may be required before this phase was introduced.

6.2.5 The meeting noted that IRCM/1 considered that, as a first step, they would attempt to outline a concept on inter regional-coordination, a function which has been tasked by ALLPIRG/3 at the regional level. This would subsequently be reported to the ALLPIRG/4. There was unanimous support that the IRC-F was a living concept and changes would be incorporated as and when appropriate.

6.2.6 With the understanding that inter-regional co-ordination requirements were generally well covered by existing ICAO procedures and practices, it was, however, agreed by IRCM/1 that the importance of the issue warranted a specific oversight of its effectiveness and a mechanism to prescribe specific actions where this was deemed necessary.

6.2.7 IRCM/1 decided that the oversight of IRC was to be conducted by meetings of the RDs mainly from adjacent Regions as well as C/RAO. The task of these meetings would be:

- a) to review the current and planned activities of the Regions concerned in order to identify areas that require inter-regional co-ordination;
- b) to determine the specific co-ordination requirements necessary, either within the existing mechanisms or ad-hoc as required to address matters identified in a) above; and
- c) to review progress of issues identified at previous meetings and take any corrective or follow-up action.

6.2.8 Draft Terms of Reference (TORs) for the meeting were developed as well as an IRC-F. The draft TORs and IRC-F could also be used for other regions. The IRC-F and draft TORs are at **Appendices A and B**.

6.2.9 IRCM/1 also discussed other inter-regional issues including:

- a) revised route structure between Asia and Europe/Middle East, South of the Himalayas;
- b) implementation of RVSM across regional boundaries;
- c) inter-regional CNS matters; and
- d) other inter-regional issues such as information sharing, inter-regional co-ordination meetings and harmonization of CNS/ATM Activities.

6.2.10 The meeting noted that the Report of the IRCM/1 was presented to the ALLPIRG/4 meeting which was held in Montreal on 6-8 February 2001 for their consideration and attention. This Group subsequently developed the following conclusion:

*Conclusion 4/2 – Inter-regional issues specifically dedicated to interface areas*

*That, ICAO convene inter-regional meetings, as and when required, to address the specifically focussed interface problems and other issues of neighbouring States and/or neighbouring regions as a whole.*

### **FRAMEWORK FOR INTER-REGIONAL-CO-ORDINATION MEETINGS**

The following principles were recognized as elements to be considered in developing a framework for IRC:

- 1) IRC may be carried out at the levels of
  - ALLPIRG
  - RDs
  - PIRGs on a peer-to-peer basis within the auspices of ICAO Secretariat
- 2) IRC convened by ICAO Regional Directors should also have the attendance of the Chief of the Regional Affairs Office. Care should be exercised not to involve too many regions at one time so that information, views and proceedings can be managed efficiently.
- 3) Support for ICAO Regional Directors at IRC Meetings may be required when dealing with operational issues in order to come to a meaningful conclusion;
- 4) A practice of rotating the venue within the common area of interest should be followed.
- 5) The host ICAO Regional Director will normally oversee the proceedings of the meeting;
- 6) IRC meetings will be kept at an informal level, with minimum focus on documentation and maximum focus on implementation enhancement;
- 7) IRC meetings will take place on an ad hoc basis. The prime task will be to identify major impediments and issues as well as to progress the implementation of other air navigation matters;
- 8) A matrix is to be developed to follow-up on inter regional issues which will identify, prioritize and describe actions by appropriate parties with specific target dates. Consideration should be given to the development of a global common database of inter regional co-ordination issues.
- 9) Progress will be reported to ALLPIRG where appropriate.
- 10) On issues of major procedural or operational differences between regions, which pose as major impediments to inter regional harmonization, the Air Navigation Commission or the Council may be advised as appropriate.
- 11) Care must be exercised to avoid duplication of efforts. The prime objective is to streamline and complement the functions of existing bodies;
- 12) Air navigation is the major thrust of IRC. Consideration should also be given to developing methodologies in other areas where gaps in States' capabilities require ICAO assistance;
- 13) IRC Meetings are unique opportunities and should be utilized to consider strategies that would give a common approach to issues of mutual interest in a manner that would enhance the visibility and presence of ICAO in the regions;

- 14) Where projects or issues cross regional boundaries consideration should be given to common agenda items at relevant PIRG meetings.

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**TERMS OF REFERENCE**

- a) Identify major impediments and issues and assess the progress of implementation of air navigation matters of inter-regional nature;
- b) Identify, prioritize and describe actions by appropriate parties with specific target dates;
- c) Develop a common database of inter-regional-co-ordination issues;
- d) Ensure that appropriate regional initiatives and information are shared with other regions;
- e) Strategize to give a common approach to air navigation issues of inter-regional nature.
- f) Keep the inter-regional – co-ordination process under continuous review to ensure optimum productivity and enhancement of the pace of implementation on air navigation matters; and
- g) Facilitate and contribute to the work of the ALLPIRG/Advisory Group.

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**Agenda Item 7: Develop and identify CNS/ATM requirements, including basic operational requirements and planning criteria, for incorporation in the Asia/Pacific Regional Basic Air Navigation Plan (ANP) and Facilities and Services Implementation Document (FASID)**

7.1 The meeting was advised that the ASIA/PAC Basic Air Navigation Plan (ANP) and the ASIA/PAC Facilities and Services Implementation Document (FASID) were expected to be approved in due course.

7.2 The meeting noted that the ASIA/PAC FASID was prepared in such a manner as to serve as a planning tool to facilitate transition from the ground based air navigation system to the satellite based CNS/ATM systems in an evolutionary manner. The FASID is therefore expected to be updated regularly to facilitate planning and implementation of the air navigation services and facilities in the region.

7.3 It was noted that in the list of Key Priorities in CNS/ATM Implementation the need to incorporate CNS/ATM material in the Basic ANP and FASID had been identified. This task was expected to be addressed by all Sub-Groups. The meeting was informed that the CNS/MET Sub-Group had undertaken the task to review the Regional Procedures contained in Part IV CNS of the Basic ANP. The task was expected to be completed in 2002.

7.4 In the MET Part of the Basic ANP and FASID the CNS/MET Sub-Group reviewed and updated the Regional Procedures and Tables and amendments to the Tables were also developed.

7.5 The meeting noted that the Regional Office, in coordination with States and users concerned, would initiate proposals for amendment of the FASID, upon approval of the Basic ANP and FASID.

**Agenda Item 8: Review and update the Asia/Pacific Regional Plan for the New CNS/ATM Systems**

8.1 The meeting was advised that the APANPIRG/11 Meeting (2-6 October 2000) under Conclusion 11/35 (APANPIRG/11 Report on Agenda Item 3 refers), updated the information contained in Chapter 5 and Chapter 7, and the status of CNS/ATM system transition tables contained in Chapters 6 to 9 of the Asia/Pacific Regional Plan for the New CNS/ATM Systems.

8.1.1 In follow-up to the APANPIRG/11 report, the Council took action on Conclusion 11/35 and approved the amendment of the ASIA/PAC Regional Plan for the New CNS/ATM Systems. In this regard, ICAO was currently processing the document for publication.

8.1.2 The meeting recognized that amending the document could be a lengthy process, and it was considered important to ensure that it was kept up to date in a timely manner, as this was a living document. This would facilitate the planning process. Accordingly, it would be beneficial to all users of the Plan for the material contained in the tables, matrixes and appendices to be updated as soon as practicable after an APANPIRG meeting.

8.1.3 In this regard, the meeting recalled that Conclusion 5/39 of APANPIRG/5 stated and agreed to follow the procedure outlined in the Conclusion:

*Conclusion 5/39 – Formulation, amendment and distribution process for the Asia/Pacific Regional Implementation Plan for the New CNS/ATM Systems*

*That, The ICAO Regional Office publish future additions of the Asia/Pacific Regional Implementation Plan for the New CNS/ATM Systems in the following manner:*

- a) as loose leaf pages (and subsequent changes) with an amendment/corrigendum page;*
- b) with amendments to Part A (Chapter 0-14) being processed through APANPIRG;*
- c) with amendments to Part B (commencing at Chapter 15) being processed by the ICAO Regional Office circulating them to States for comment, then distributing the updated pages (using sidelining); and*
- d) by including a checklist of current pages as well as individual page dating with each amendment.*

8.1.4 It was agreed that the above procedure would be adopted forthwith for ease of processing changes. It was noted that since APANPIRG/5 agreed to Conclusion 5/39, there had been additional changes to this procedure which had been updated as appropriate.

8.1.5 The meeting noted that, in regard to b) and c) above, the structure of the Plan had been changed and Part A and Part B are no longer separate parts. They have now been incorporated into the body of the Plan.

8.1.6 The meeting reviewed the Asia/Pacific Regional Implementation Plan for the New CNS/ATM Systems, Issue 5, together with the changes reviewed by APANPIRG/11. The Plan was updated and shown in **Appendix A** to the Report on Agenda Item 8. It will be published as Issue 6.





















**Agenda Item 9: Identify Shortcomings and Deficiencies in the Air Navigation Field**

9.1 The meeting recalled that the Terms of Reference of APANPIRG calls for its Sub-Groups to identify specific problems in the air navigation field, and to propose in appropriate form, action aimed at solving these problems. In this regard, the ICAO Council on 23 June 1998 established a uniform methodology for the identification, assessment and reporting of such shortcomings and deficiencies, The meeting noted that, based on information provided by ATS/AIS/SAR/SG/11 (25-30 June 2000) and COM/MET/SG/5 (16-20 July 2000), a number of follow-up actions had been taken to pursue the outstanding shortcomings and deficiencies with the States concerned, and as a result some of the outstanding issues had been resolved.

9.2 The meeting reviewed the list of air navigation shortcomings and deficiencies, which was updated with official information provided by Indonesia and the Philippines (**Appendix A** refers). Also, China advised the meeting that WGS-84 had been partially implemented in China, and official notification of the details would be provided to ICAO in due course.

9.3 The meeting was informed by the Secretariat that the Air Navigation Commission (ANC 155-10), during its consideration of the uniform methodology for the identification, assessment and reporting of air navigation shortcomings and deficiencies, agreed that clear guidelines on the current uniform methodology should be developed to assist the PIRGs with the reporting of detailed assessments of shortcomings and deficiencies to accommodate States' filing of differences to Standards and Recommended Practices (SARPs) in relation to an air navigation plan as amended. In this regard, the Commission (157-8) on 5 June 2001 agreed on a proposed single definition of "deficiencies" to replace "shortcomings and deficiencies". This proposal is being considered by the Council and the uniform methodology amended to reflect the single definition as appropriate.

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**AIR NAVIGATION SHORTCOMINGS AND DEFICIENCIES IN THE ATS/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
<u>ATS routes</u>									
A202	China/Hong Kong, China/Japan/Lao PDR /Thailand/Viet Nam	Not implemented	24/11/93	S	Co-ordination is in progress among States and ICAO through SCS/TF. Hong Kong-Bangkok segment will be implemented on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States. China/Hong Kong, China/Lao PDR/Thailand/Viet Nam - implementation on 1 November 2001. Japan-propose deletion of Hong Kong-Chitose segment.	China/Hong Kong, China/ Japan/Lao PDR/ Thailand/Viet Nam	HongKong-Bangkok segment 1/11/2001	B
A203	China/Hong Kong, China	Not implemented	24/11/93	S		China - consider implementation	China/Hong Kong, China		B
A211	Malaysia	Not implemented	24/11/93	S	ICAO has requested Malaysia to co-ordinate the early implementation of A211 with States concerned, and awaits input from Malaysia	ICAO - co-ordinate with Malaysia and report the outcome to SEACG. Malaysia co-ordinating with Indonesia.	Malaysia ICAO	12/2001	B
A218	China/Russian Federation	Partially implemented	24/11/93	S	ICAO has taken action to co-ordinate with China/Russian Federation for implementation of Harbin-Ekimchan segment and to amend ANP. APAC 99/1-ATS was approved on 26/1/00.	China/Russian Federation - consider implementation	China/Russian Federation		B
A223	Japan	Not implemented	24/11/93	S		Japan - consider implementation	Japan		B
A335	China/Mongolia/Russian Federation	Not implemented	24/11/93	S	China and Mongolia advised that this segment is covered by other ATS routes properly; thus will propose its deletion from ANP.	China, Mongolia - propose ANP amendment	China/Mongolia		B
A341	Indonesia/Malaysia	Partially implemented	24/11/93	S	ICAO has requested Indonesia to co-ordinate implementation with Malaysia	Indonesia/Malaysia - consider full implementation	Indonesia/Malaysia	12/2001	B

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**AIR NAVIGATION SHORTCOMINGS AND DEFICIENCIES IN THE ATS/AIS/SAR FIELDS IN THE ASIA/PACIFIC REGION**

Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
A450	Indonesia/United States	Partially implemented	24/6/94	S	ICAO has requested Indonesia to co-ordinate implementation with United States. United States has agreed to the implementation, and a response from Indonesia is being awaited.	Indonesia/United States - consider full implementation	Indonesia/United States		B
A469	Viet Nam	Implemented as W9	19/8/94	S	ICAO has requested Viet Nam to implement as A469. Viet Nam advised that W9 will be replaced with L643 on 1 November 2001.	Viet Nam - propose deletion of the requirement as A469	Viet Nam		B
A470	China/Viet Nam	Partially implemented	19/8/94	S	Co-ordination is in progress among States and ICAO through SCS/TF. Mersing-Hong Kong segment will be deleted from the ANP requirement, and the rest will be implemented on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States	China/Viet Nam	1/11/2001	B
A473	India/Nepal	Not implemented	16/3/99	S	India has advised that realignment is being co-ordinated with Nepal.	India/Nepal- consider implementation	India/Nepal	12/2001	B
A581	China/Lao PDR/Thailand	Partially implemented	17/2/97	S	ICAO has requested China to co-ordinate implementation. China, Lao PDR and Thailand have proposed an amendment to ANP.	ICAO - process APAC99/11 in co-ordination with China/Myanmar/Thailand. APAC99/1 was approved on 15 December 2000. China/Lao PDR/Thailand - implement accordingly.	China/Lao PDR/Thailand		B
A584	United States	Partially implemented	24/6/94	S	ICAO has requested United States to implement the missing segment. United States has proposed deletion of the missing segment, and the proposal is under preparation.	ICAO - process an amendment in co-ordination with United States	United States ICAO		B
B201	Fiji/New Zealand	Not implemented	24/11/93	S	Fiji/New Zealand have advised that they agreed to delete the requirement, ICAO will process ANP amendment.	Fiji/New Zealand - propose an amendment to delete the requirement in ANP	Fiji/New Zealand ICAO		B

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
B204	Maldives	The requirements for this route are not detailed in ANP	24/1/96	S		Maldives - propose an amendment to ANP to add the route	Maldives		B
B212	Japan/Rep of Korea	Not implemented	24/11/93	S	Japan is considering implementation as a conditional route	Japan/Rep of Korea - consider implementation	Japan/Rep of Korea		B
B213	China	Not implemented	24/11/93	S		China - consider implementation	China		B
B456	Papua New Guinea	Partially implemented	24/11/93	S	Papua New Guinea has advised that they will formally propose ANP amendment for deletion of the missing segment.	Papua New Guinea - propose an amendment to ANP. ICAO-process ANP amendment.	Papua New Guinea ICAO		B
B591	China	Partially implemented	22/7/97	S	Co-ordination is in progress among States and ICAO	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States	China		B
G211	Malaysia	Not implemented	24/11/93	S	ICAO has requested Malaysia to implement G221. Malaysia has advised that implementation co-ordination is on-going.	Malaysia - consider implementation	Malaysia	12/2001	B
G348	India	Partially implemented	2/3/99	S	Bhutan has advised that route segment in Bhutan airspace has been implemented.	India - implement the route	India	31/10/2001	B
G461	Indonesia	Implemented with different route specification	24/11/93	S	ICAO has taken action to co-ordinate with Indonesia to amend ANP requirement. APAC00/1-ATS to amend the requirement has been circulated.	ICAO - process APAC 00/1. APAC00/1 was approved on 15 January 2001. Indonesia-implement the requirement accordingly.	Indonesia ICAO		B
G466	Malaysia	Partially implemented	22/7/97	S	Co-ordination is in progress among States and ICAO. Route requirement will be amended in relation to SCS route structure and be implemented on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States Malaysia - consider implementation	Malaysia	1/11/2001	B

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
G473	Lao PDR/Philippines Thailand/Viet Nam	Partially implemented	24/11/93	S	Co-ordination is in progress among States and ICAO	ICAO - continue ongoing implementation co-ordination related to the Revised South China Sea route structure with States	Lao PDR/Philippines Thailand/Viet Nam		B
G589	DPR Korea/ Rep of Korea	Not implemented	24/11/93	S		DPR Korea/ Rep of Korea - consider implementation	DPR Korea/ Rep of Korea		B
R207	Lao PDR	Partially implemented as W29	24/11/93	S		Lao PDR - consider promulgation of the route with route designator R207	Lao PDR		B
R216	China/Kazakhstan	Not implemented	24/11/93	S		ICAO - co-ordinate with States for implementation and report the outcome to EAAR	China/Kazakhstan		B
R221	Russian Federation	R221 was implemented on 19 April 2001 in Malaysia in accordance with the requirement in ASIA/PAC ANP. The same route designator in use in Russian Federation	24/11/93	S	ICAO has requested Russian Federation to delete R221 and promulgate the route as R466 in AIP. Input from Russia is being awaited.	ICAO - co-ordinate with Russian Federation to redesignate the route as R466 as already assigned as a matter of priority	Russian Federation		A
R333	China	Not implemented	24/11/93	S	China is considering future implementation	China - consider implementation	China		B
R335	China/Hong Kong, China	Not implemented	24/11/93	S		China - consider implementation	China/Hong Kong, China		B
R345	Cambodia/Lao PDR/Thailand	Not implemented	24/11/93	S	Co-ordination is in progress among States and ICAO	ICAO - continue ongoing implementation co-ordination related to the Revised South China Sea route structure with States	Cambodia/Lao PDR/Thailand		B
R455	Malaysia	Not implemented	24/11/93	S	ICAO has requested Malaysia to co-ordinate the implementation of R455 with States concerned.	Malaysia - consider implementation	Malaysia	12/2001	B
R459	Indonesia	Implemented as W51 and W36	24/11/93	S	ICAO has requested Indonesia to implement as R459	Indonesia - consider promulgation of the route with designator R459 in AIP	Indonesia		B

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
R466	Russian Federation	Implemented as R221 in Russian Federation. Route requirement is listed in EUR/NAT ANP	24/11/93	S	ICAO has requested Russian Federation to delete R221 and promulgate the route as R466 in AIP, and awaits input from Russia.	ICAO - co-ordinate with Russian Federation to redesignate the route as R466 as already assigned as a matter of priority	Russian Federation		A
R579	Indonesia/Malaysia	Not implemented	24/11/93	S	ICAO has requested Malaysia to co-ordinate with Indonesia for implementation.	Indonesia/Malaysia - consider implementation	Indonesia/Malaysia	12/2001	B
R593	India/Oman	Not implemented	24/11/93	S		India - consider implementation ICAO - co-ordinate with Oman for implementation and report the outcome to SWACG	India/Oman (SWACG) ICAO		B
Revised South China Sea Route Structure	Cambodia/China/ Hong Kong, China/Malaysia Philippines/Singapore/ Thailand/Viet Nam	Not implemented	22/7/97	S	Co-ordination is in progress among States and ICAO. States concerned agreed to implement SCS route structure on 1 November 2002.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States through SCS/TF.	Cambodia/China/ Hong Kong, China/Malaysia/ Philippines/Singapore/ Thailand/Viet Nam	1/11/2001	A
<u>WGS-84</u>									
WGS-84	Bhutan	Not implemented	2/7/1999	D	Data conversion completed, but not published		Bhutan		A
WGS-84	Cambodia		28/6/2001	D	Cambodia has previously informed ICAO that their WGS-84 conversion had been completed. Cambodia has now informed ICAO of flaws in their conversion and their intention to start all over again.		Cambodia		A
WGS-84	China	Not implemented	2/7/1999	D	Differences to Annex 15 - <i>Aeronautical Information Services</i> are notified		China		A
WGS-84	DPR Korea	Not implemented		D			DPR Korea		A
WGS-84	French Polynesia	Implemented at main airports		D	in progress		French Polynesia	2003	A
WGS-84	Kiribati	Not implemented		D			Kiribati		A

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
WGS-84	Lao PDR	Partially implemented		D			Lao PDR	1999	A
WGS-84	Malaysia	Partially implemented		D	in progress		Malaysia	June 2001	A
WGS-84	Nauru	Not implemented		D	Conferring with consultant		Nauru		A
WGS-84	Philippines	Partially implemented		D			Philippines	Aug 2001	A
WGS-84	Solomon Islands	Not implemented		D			Solomon Islands	1999	A
WGS-84	Vanuatu	Implemented at main airports	2/7/1999	D			Vanuatu	1999	A
<u>Type of ATS</u>									
Area Control Services	India	Some ATS route segments in part of Mumbai FIR are subject to Advisory Services	24/11/93	D	Co-ordination in progress through BBACG	India - implement Area Control Services	India		A
Area Control Services	Sri Lanka	Several ATS route segments are subject to Advisory Services	24/11/93	D	Co-ordination in progress through BBACG	Sri Lanka - implement Area Control Services	Sri Lanka		A
<u>Airspace Classification</u>									
Airspace Classification	China	Not implemented	7/7/99	D			China		A
Airspace Classification	Cook Islands	Not implemented	7/7/99	D			Cook Islands		A
Airspace Classification	DPR Korea	Not implemented	7/7/99	D			DPR Korea		A
Airspace Classification	Japan	Not implemented	7/7/99	D		Implementation in progress	Japan		A
Airspace Classification	Kiribati	Not implemented	7/7/99	D			Kiribati		A
Airspace Classification	Lao PDR	Not implemented	7/7/99	D			Lao PDR		A
Airspace Classification	Nauru	Not implemented	7/7/99	D			Nauru		A
Airspace Classification	Papua New Guinea	Not implemented	7/7/99	D			Papua New Guinea	mid 2001	A
Airspace Classification	Republic of Korea	Not implemented	7/7/99	D			Republic of Korea		A

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
Airspace Classification	Samoa	Not implemented	7/7/99	D			Samoa		A
Airspace Classification	Solomon Islands	Not implemented	7/7/99	D			Solomon Islands		A
Airspace Classification	Sri Lanka	Not implemented	7/7/99	D			Sri Lanka		A
Airspace Classification	Tonga	Not implemented	7/7/99	D			Tonga		A
Airspace Classification	Viet Nam	Not implemented	7/7/99	D			Viet Nam		A
<u>AIP Format</u>									
AIP Format	China	Not implemented	7/7/99	D			China		A
AIP Format	Cook Islands	Not implemented	7/7/99	D			Cook Islands		A
AIP Format	Fiji	Not implemented	7/7/99	D			Fiji		A
AIP Format	India	Not implemented	7/7/99	D			India	Oct, 2001	A
AIP Format	Indonesia	Not implemented	7/7/99	D		Implementation in progress	Indonesia		A
AIP Format	Kiribati	Not implemented	7/7/99	D			Kiribati		A
AIP Format	Lao PDR	Not implemented	7/7/99	D			Lao PDR		A
AIP Format	Myanmar	Not implemented	7/7/99	D			Myanmar		A
AIP Format	Nauru	Not implemented	7/7/99	D			Nauru		A
AIP Format	New Zealand	Not implemented	7/7/99	D	Differences to Annex 15 - <i>Aeronautical Information Services</i> are notified		New Zealand		A
AIP Format	Papua New Guinea	Not implemented	7/7/99	D			Papua New Guinea	mid 2001	A
AIP Format	Philippines	Not implemented	7/7/99	D			Philippines	Aug 2001	A
AIP Format	Samoa	Not implemented	7/7/99	D			Samoa		A
AIP Format	Sri Lanka	Not implemented	7/7/99	D			Sri Lanka		A

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Identification		Shortcomings and Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Date of completion	Priority for action**
AIP Format	Tonga	Not implemented	7/7/99	D			Tonga		A
<u>SAR capability</u>									
SARPs in Annex 12	Cambodia	Annex 12 requirements not implemented. No agreements with adjacent States.	20/2/97	D		Cambodia - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cambodia		U
SARPs in Annex 12	Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95	D		Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands		U
SARPs in Annex 12	Maldives	Annex 12 requirements not implemented. No agreements with adjacent States.	24/4/1997	D		Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Maldives		U

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
VHF coverage to be provided in the Southern Part of Dhaka FIR and withdrawal of HF	Bangladesh	No requirement for HF except for smaller portion of FIR. HF used for ground-to-ground COM due to lack of ER VHF and reliable ATS DSCs.	1992	No change  S	HF air ground channels are used to exchange co-ordination messages causing frequency congestion	Survey of the installation sites for RCAG stations has been completed and other formalities are in progress.	Civil Aviation Authority of Bangladesh	Target date being changed each time the status was reviewed and currently established for June <del>2001</del> . 2002.	A
RCAG VHF at Port Blair	India	RCAG station to be established at Port Blair linked to Calcutta and Chennai ACCs	1992	D  Implemented	HF air ground communications channels are congested and requirement for RCAG was identified.	RCAG VHF station has been put into operation at Port Blair controlled by Chennai in 10/12/2000. RCAG VHF station at Port Blair controlled by Calcutta is being tested and will put into operation by end of 2000. was put into operation on 15/11/2000.	Airports Authority of India	<del>December 2000</del> .  Action completed. Awaiting formal notification  India formally notified of implementation	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
Reliable AFS communications between Calcutta and Dhaka FIRs.	Bangladesh and India	Performance of the Calcutta/Dhaka HF RTT AFTN Circuit has been far below the required reliability of 97%. ATS DSC not implemented. IDD service used for ATS coordination not meeting operational requirement. Agartala/Dhaka and Dhaka/Guwahati. ATS DSCS not implemented.	ATS DSC 1993  AFTN 1995	No change  D	HF RTT circuit needs to be upgraded to LTT. Corrective action required to improve performance of the IDD services initially. A dedicated circuit should be established between Calcutta and Dhaka. IDD service to be provided for Agartala/Dhaka and Dhaka/Guwahati ATS DSC.	Action is being initiated to upgrade the HF RTT circuit and also to introduce Hotline IDD to enhance reliability pending, establishment of a dedicated circuit. Requirement for Agartala/Dhaka and Dhaka/Guwahati ATS DSC to be satisfied by IDD initially. India is ready for establishing the circuits with microwave.	CAA Bangladesh and Airports Authority of India	<del>End of 2000</del> 10/01  06/02	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
Reliable HF/VHF and ATS direct speech circuits in India FIRs	India	RCAG VHF not reliable. HF congested. Some of the ATS DSCs use IDD and operational requirement is not met.	1999	D  Implementation processing	Provision for a reliable link to RCAG stations is required to improve quality of VHF. Implementation of reliable ATS DSC is required to satisfy 15 second access time. HF congestion will be reduced upon improvement in coverage of VHF and availability of reliable of ATS DSCs.	VSAT progressively introduced for RCAG VHF stations. RCAG VHF stations at Porbandar and Agatti controlled from Mumbai is to be established by October 2001 and RCAG VHF station at Vishakhapatnam controlled by both Chennai and Calcutta is are being established on 10 Oct. 2000. IDD Hotlines have been introduced for ATS DSC communication, satisfying requirements in most cases. HF congestion reduced due to enhancement in IDD communication and also to some extent due to the use of CPDLC.	Airports Authority of India	End of 2000  Oct. 2001	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action*
Adequate and reliable VHF COM	Myanmar	Quality and reliability of RCAG VHF inadequate and unavailability of required coverage	1998	No change  D	Improvements in the quality of link to RCAG stations and power supply system are required.	Action should be taken to provide reliable links between the RCAG stations and Yangon ACC. Power supply to the RCAG sites needs improvement.	DCA Myanmar	Established target date of end 1999 was not achieved. Revised target date is end of <del>2000</del> 2002	A
Harmful radio Interference	Philippines	Manila approach and departure frequencies suffer harmful interference	1999	No Change  Implemented  D		Action has been initiated by Air Transportation Office with concerned authority to eliminate the problem	Air Transportation Office	As soon as possible. Action completed. Awaiting formal notification  Philippines formally notified of implementation	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
Meteorological observations and reports. Provision of Annex 3, Chapter 4	Solomon I.	Weather information is inadequate and not provided on a regular basis	1996	No Change D	Reported by airlines operating to Solomon I.	Equipment to be upgraded and arrangements to be made for regular observations	Ministry of Transport, Works and Aviation, Solomon I.	To be determined	A
a) Requirements for forecasts to be provided. ASIA/PAC ANP, Part IV- Meteorology. Table MET 1A b) Meteorological observations and reports. Provision of Annex 3, Chapter 4.	Kiribati	a) TAFs for Kiritimati not regularly provided by MET Centre of Fiji. b) MET observations from Kiribati not available on regular basis	1998	S  D	Reported by the National Weather Service concerned during introduction of the new flight operations. Fiji reported that MET observations not regularly available due to communication problems	a)Temporary arrangements have been made for the Honolulu MET Office to issue 18-hour TAFs during special flight operations. b)Communication between Kiribati and Fiji required to be considered c) Fiji issues TAFs for Kiribati on a regular basis. d) MET observations in Kiribati in process of implementation	Directorate of Civil Aviation, Kiribati Civil Aviation Authority, Fiji COM/MET/N AV/SUR SG	To be determined	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
<p>a) Reporting of information on volcanic eruptions to civil aviation units. Provision of Annex 3, Chapter 4.</p> <p>b) International airways volcano watch (IAVW) operational procedures.</p>	Indonesia Philippines	Information on volcano activities not always reach civil aviation units due to lack of fixed communications with volcano observatories	1995	D	<p>a) Observed by States concerned</p> <p>b) Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)</p>	<p>a) MOU will be signed between Department of Transportation and Department of Mining and Energy, Indonesia</p> <p>b) Volcano observations and warnings will be made available on the Internet by Department of Mining and Energy.</p> <p>c) It is expected that MOU between Air Transportation Office and the Philippines Institute of Volcanology and Seismology will be considered.</p> <p>Office and the Philippines Institute of Volcanology and Seismology will be considered.</p>	<p>a) Volcanic Ash Warning Study Group (VAWSG) to develop proposal.</p> <p>b) ICAO Regional Office to monitor developments on this subject.</p>	2000 to be determined	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action**
<p>a) Service for operators and flight crew members Provision of Annex 3, Chapter 9.</p> <p>b) Requirements for WAFS products for flight documentation. ASIA/PAC ANP, Table MET 1A</p>	<p>Cambodia Myanmar <del>Papua New Guinea</del> <del>PAC States</del></p>	<p>VSATs for reception of the ISCS and SADIS satellite broadcasts not installed</p>	<p>1999</p>	<p>D</p>	<p>Expected lack of products for flight documentation due to forthcoming implementation of the final phase of WAFS and cease of RAFCs operations.</p>	<p>States consider urgent action to be taken for implementation of the ISCS and/or SADIS to install VSATs</p>	<p>Civil Aviation Administrations in co-ordination with Met. Authorities of the States concerned. COM/MET/NAV/SUR SG to monitor and coordinate.</p>	<p><del>2001</del> to be determined</p>	<p>A</p>

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action* *
a) Aerodrome meteorological office meteorological watch office Provisions of Annex 3, Chapter 3. b) Requirement for aerodrome meteorological office to be established ASIA/PAC ANP, Table MET 1A Requirements for meteorological watch office to be established ASIA/PAC ANP, Table MET 2A	Cambodia	Requirements for aerodrome meteorological office and meteorological watch office (WMO) to be established at Phnom-Penh international airport have not been met	1992	No Change S	Requirements have not been met due to staffing and funding problems. MET briefing and flight documentation for return flights provided by the MET offices of other aerodromes	The Authority concerned to take urgent actions to meet requirements of ANP. If MWO is not able to meet all its obligations, proposal to be considered for temporary transfer of its responsibilities to another MWO and a NOTAM to be issued to indicate such a transfer	State Secretariat of Civil Aviation, Cambodia	To be determined	A

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Identification		Shortcomings and deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (S, D)*	Remarks	Description	Executing body	Target for completion	Priority for action**
<p>a) SIGMET information Provision of Annex 3 Chapter 7.</p> <p>b) Requirements for dissemination of SIGMETs, including SIGMETs for volcanic ash ASIA/PAC ANP (FASID) Table MET 2A</p> <p>c) International airways volcano watch (IAVW) operational procedures.</p>	<p>Bangladesh Cambodia India Indonesia Lao Malaysia Myanmar Nepal Papua New Guinea Philippines Sri Lanka</p>	<p>Requirements for issuance and proper dissemination of SIGMETs, including SIGMET for volcanic ash, have not been fully implement</p>	<p>2000</p>	<p>a) D  b) S</p>	<p>a) reported by airlines, b) noted by Volcanic Ash Advisory Centres</p>	<p>a) ICAO to consider proposal for Special Implementation Project be Established with the primary objective to improve implementation of SIGMET procedures b) States to take urgent actions to implement the procedures</p>	<p>a) ICAO to establish and implement the SIP b) ICAO Regional Office to co-ordinate c) Volcanic Ash Working Group to assist Secretariat with development of SIP and its implementation d) COM/MET/NAV/SUR/SG to monitor</p>	<p><del>2001</del> 2002</p>	<p>A</p>
<p><u>METAR/TAF Provision of Annex 3 Chapter 4 and 6</u></p>	<p><u>Nauru Solomon I. Papua New Guinea</u></p>	<p><u>Routine reports and aerodrome forecasts are issued using old WMO codes.</u></p>	<p><u>2001</u></p>	<p><u>D</u></p>	<p><u>Reported by airlines</u></p>	<p><u>a) Arrangements to be made for use of the new WMO codes.</u> <u>b) Training to be provided to staff as required</u></p>	<p><u>Civil Aviation Administration in coordination with MET Services</u></p>	<p><u>2002</u></p>	<p><u>A</u></p>

**Agenda Item 10: Develop and propose to APANPIRG an appropriate future work programme**

10.1 Following the CNS/ATM/IC/SG/7 meeting in August 2000, the Sub-Group reviewed its Terms of Reference (**Appendix A**) and method of operation. The meeting in considering the current terms of reference (TOR) and work programme, was of the view that the goal of the Sub-Group had been achieved and the meeting had been productive in the work achieved and of considerable value to the participants.

10.1.1 The members were enthusiastic in their support to continue the Sub-Group and their views are summarized below:

- a) the Sub-Group provided a forum to study emerging concepts of air traffic management and to expedite their adoption by States;
- b) it was an invaluable forum for focusing on future CNS/ATM requirements for the region;
- c) States not advanced in the implementation of CNS/ATM systems received valuable information, expertise and guidance on how to acquire, implement and operate new CNS/ATM systems;
- d) it was considered that due to the considerable investment by users and providers, there was an ongoing need to place a strong emphasis on regional and inter regional coordination of CNS/ATM implementation, and this group had demonstrated that it could and should continue to be involved;
- e) some States felt that there was a need to make a clear distinction between the roles of the CNS/MET/SG and the CNS/ATM/IC/SG to ensure that there was no duplication of tasks;
- f) as many groups were looking at CNS/ATM issues, this group needed to be focused on its implementation and co-ordination role;
- g) it was considered appropriate that this Group has a role in the development of mechanism for the implementation of CNS/ATM system in the region for airspace safety management including regulatory requirements, monitoring of system performance and arrangements for funding to meet the new provisions of Annex 11 and PANS-RAC applicable on 1 November 2001; and
- h) in considering future activities, the group could take a proactive approach to study the ATM Concept Document being prepared by ICAO, with a view to its applicability to the region, taking account ATM strategic planning by States in the region.

10.1.2 It was agreed that the CNS/ATM/IC/SG should continue as the forum for the ongoing implementation and co-ordination of CNS/ATM intra and inter regional activities. There was also agreement that the Sub-Group should revise its terms of reference (Appendix A) to provide greater emphasis on the co-ordination, monitoring and advancement of CNS/ATM activities and to eliminate areas of duplication of work with other Sub-Groups. The meeting recognized that there would be a need to develop a work programme from the revised TOR.

10.1.3 The meeting concluded that APANPIRG/12 should consider that the Sub-Group continue its activities and that the draft revised terms of reference contained in **Appendix B** be adopted.

10.1.4 In view of the foregoing the meeting formulated the draft Decision as follows:

**Draft Decision 8/6 – Amendment to the Terms of Reference of the  
CNS/ATM/IC/SG**

That, the CNS/ATM/IC/SG should continue as an active Sub-Group of APANPIRG and the revised Terms of Reference provided in Appendix B be adopted.

**COMMUNICATIONS, NAVIGATION, SURVEILLANCE  
& AIR TRAFFIC MANAGEMENT  
IMPLEMENTATION CO-ORDINATION SUB-GROUP (CNS/ATM/IC/SG)**

**TERMS OF REFERENCE AND WORK PROGRAMME**

1. Co-ordinate the updating, on a regular basis of the ASIA/PAC Regional Plan for the new CNS/ATM systems in the light of new developments;
2. Monitor the research and development, trials and demonstrations within the ASIA/PAC Regions and information from other Regions;
3. Co-ordinate the plans of States, international organizations, airlines and industry for the implementation of the ASIA/PAC Regional Implementation Plan for the new CNS/ATM systems;
4. Provide a forum for the active exchange of information between States and for the resolution of planning and implementation problems as they arise;
5. Facilitate the transfer of CNS/ATM systems expertise, equipment, trials data, etc. between States;
6. Provide appropriate review and co-ordination of amendments to the Regional Air Navigation Plan to ensure adoption of the new CNS/ATM requirements including Basic Operational Requirements and Planning Criteria;
7. Review and identify shortcomings or deficiencies that impede implementation or affect provision of efficient CNS/ATM services;
8. Identify and co-ordinate CNS/ATM priorities for the ASIA/PAC Region;
9. Promote and progress implementation activities in the field of CNS/ATM in the ASIA/PAC;
10. Review and identify intra and inter regional co-ordination issues and where appropriate recommend actions to address those issues; and
11. Ensure the harmonization and convergence of national, ASIA/PAC and Global CNS/ATM plans.

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**COMMUNICATIONS, NAVIGATION, SURVEILLANCE  
& AIR TRAFFIC MANAGEMENT  
IMPLEMENTATION CO-ORDINATION SUB-GROUP (CNS/ATM/IC/SG)**

**REVISED TERMS OF REFERENCE**

1. Review and update, on a regular basis, the “Asia/Pacific Regional Plan for the New CNS/ATM Systems” and ensure the harmonization with the Global Air Navigation Plan for CNS/ATM Systems;
2. Monitor the research and development, trials and demonstrations being carried out in the Asia/Pacific as well as other regions for the implementation of CNS/ATM systems;
3. Co-ordinate the plans of States, international organizations, airlines and industry for the implementation of the ASIA/PAC Regional Implementation Plan for the new CNS/ATM systems;
4. Identify CNS/ATM priorities for the ASIA/PAC region, co-ordinate and monitor implementation;
5. Review and identify intra and inter-regional CNS/ATM co-ordination matters and where appropriate recommend actions to address these issues;
6. Co-ordinate and harmonize the establishment and operation of ASIA/PAC system performance monitoring agencies for implementation of CNS/ATM systems and reduced separation minima, and co-ordinate with other regional monitoring agencies; and
7. Study the ICAO ATM Concept Document in regard to its applicability in the region, taking into account State strategic planning.

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**Agenda Item 11: Any other business**

11.1 The meeting was advised that in keeping with environmental concerns, consideration should be given to supplying the Report of the Meeting to States and other organizations concerned on individual CD ROMs at the end of the meeting. However, after discussion it was considered impractical to do this as the Report on the CD ROM would be in draft only. The Secretariat advised the meeting that copies of the Report could be sent to participants by e-mail on request. It was further agreed that the Report of the Meeting as well as other such reports of similar meetings would be placed on the ICAO website for the use and information to all concerned. The meeting requested the Secretariat to consider the above for future meetings.

**Agenda Item 12: Propose date and venue for next meeting**

12.1 The date for the next meeting would be decided by APANPRIG/12 and members will be notified in due course. The meeting will be held at the ICAO Bangkok Office. It was recognized that there was a need for a period of time between CNS/ATM/IC/SG meeting and APANPIRG to allow for a review of the meeting report prior to the APANPIRG meeting.

**LIST OF PARTICIPANTS**

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>AUSTRALIA</b>		
Mr. Stephen Pearce	ATM Strategic Planning Coordinator Air Traffic Management Airservices Australia 25 Constitution Avenue Canberra ACT 2615 Australia	Tel: 61 2 6268 5552 Fax: 61 2 6268 4848 Mobile: 61 40 726 9076 E-mail: stephen.pearce@airservices.gov.au
Mr. Ian Mallett	Head Aerodrome and CNS/ATM Standards Civil Aviation Safety Authority P.O. Box 2005 Canberra ACT 2601 Australia	Tel: 61 2 6217 1736 Fax: 61 2 6217 1700 E-mail: ian.mallett@casa.gov.au
Mr. Alexis Grenon	CNS/ATM Asia Pacific Bid Manager THALES ATM 780 Elizabeth Street Melbourne, Victoria 3000 Australia	Tel: 61 3 9341 3678 Fax: 61 3 9347 2018 E-mail: alixis.grenon@thalesatm.com
<b>BHUTAN</b>		
Mr. Pema Tashi	Senior Technical Officer Department of Civil Aviation Ministry of Communications Woochu, Paro Bhutan	Tel: (975) 8 271407(Airport) (975) 8 271347 (HQ) Fax: (975) 8 271407 (Airport) E-mail: aviation@druknet.net.bt
<b>BRUNEI DARUSSALAM</b>		
Mr. Koh Han Kok	Air Traffic Control Officer Department of Civil Aviation Ministry of Communications Brunei International Airport Bandar Seri Begawan BB2513 Brunei Darussalam	Tel: 673-2-330454 Fax: 673-2-331157 E-mail: hankokkoh@hotmail.com

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>CHINA</b>		
Mr. Qin Zhi	Senior Engineer Air Traffic Management Bureau of CAAC P.O. Box 2272, Shilihe, Chaoyang Dis. Beijing 100021 People's Republic of China	Tel: 86-10-6731 8866 ext 4046 Fax: 86-10-6731 8478 E-mail: peter_qinzhi@hotmail.com
Mr. Zhu Yanbo	Chief Engineer Aviation Data Communication Corp. of CAAC P.O. Box 2272, Shilihe, Chaoyang Dis. Beijing 100021 People's Republic of China	Tel: 86-10-6733 0459 Fax: 86-10-6731 8520 E-mail: zyb@adcc.com.cn
<b>HONG KONG, CHINA</b>		
Mr. Leung Woon-yin	Assistant Director-General (Engineering & Systems) Civil Aviation Department 10 <sup>th</sup> Floor, Commercial Building AFFC 2 Chun Wan Road Chek Lap Kok, Lantau Hong Kong, China	Tel: 852-2591 5000 Fax: 852-2845 7160 E-mail: wyleung@cad.gov.hk
Mr. Raymond Tse Ki-wai	Senior Operations Officer (Project & Development) Air Traffic Management Division Civil Aviation Department 4 <sup>th</sup> Floor, Air Traffic Control Complex Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852-2910 6443 Fax: 852-2910 0186 E-mail: rkwtse@cad.gov.hk
Mr. Fan Ka-wah	ATS Supervisor Air Traffic Management Division Civil Aviation Department 4 <sup>th</sup> Floor, Air Traffic Control Complex Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852-2910 6821 Fax: 852-2910 1177 E-mail: atmdwsu@cad.gov.hk

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>INDIA</b>		
Mr. Lajpat Rai Garg	Executive Director (IPC) Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110 003 India	Tel: 91 11 462 8124 Fax: 91 11 461 1065
Mr. Amar Nath Khera	Addl. General Manager (ATM) Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 India	Tel: 91 11 465 2649 Fax: 91 11 4611078
<b>INDONESIA</b>		
Mr. Novie Riyanto Rahardjo	Directorate of Aviation Safety DGAC – Indonesia Jl. Merdeka Barat No. 8 GD. Karya Lt. 23 Jakarta Indonesia	Tel: 62-21-3506451 Fax: 62-21-3506451 E-mail: novie_riyanto@usa.net
<b>JAPAN</b>		
Mr. Takashi Arima	Special Assistant to the Director Air Traffic Services System Planning Division Air Traffic Services Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki, Chiyoda-ku Tokyo 100 8918 Japan	Tel: 81-3-5253 8739 Fax: 81-3-5253 1663 E-mail: arima-t2cv@mlit.go.jp

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>MALAYSIA</b>		
Mr. Jamil Khir Mohamed	Assistant Director Air Traffic Services Division Department of Civil Aviation Malaysia Air Traffic Control Complex Sultan Abdul Aziz Shah Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603 7465233 Fax: 603 7472997 E-mail: accwmfc@tm.net.my Jamilk@tm.net.my
Mr. Johnli Bin Idek	Air Traffic Control Officer Air Traffic Control Center Department of Civil Aviation 88618 Kota Kinabalu Sabah, Malaysia	Tel: 06-088-224911 Fax: 06-088-219198/219170 E-mail: dcasbh@tm.net.my
Capt. Kamal Hisham	Fleet Manager B747 Malaysia Airlines Flight Operations Division Ground Floor, East Wing Flight Management Building 64000 Sepang Malaysia	Tel: 603-8775 5308 Fax: 603-8787 1240 E-mail: kamalh@pc.jaring.my
Mr. Rais Bin Jasmari	Assistant Manager Telekom Malaysia Specialised Network Services 1 <sup>st</sup> Floor, 1 Busawat Telekom Lts 47200 Subang, Selangor Malaysia	Tel: 603-746 3491 Fax: 603-746 3541 E-mail: jrais@telekom.com.my
<b>MONGOLIA</b>		
Mr. Sedbazar Manlai	Manager of ATS Department Civil Aviation Authority of Mongolia Buyant Ukhaa Airport Ulaanbaatar 34 Mongolia	Tel: 976-11-986016 Fax: 976-11-379888 E-mail: manlai@mcaa.gov.mn
Mr. R. Baatarkhuyag	Director of ATS Division Civil Aviation Authority of Mongolia Buyant Ukhaa Airport Ulaanbaatar 34 Mongolia	Tel: 976-11-985029 Fax: 976-11-379525 E-mail: baatarkhuyag@mcaa.gov.mn

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>NEW ZEALAND</b>		
Mr. Rodney Bracefield	Manager CNS/ATM Civil Aviation Authority of New Zealand P.O. Box 31-441 Lower Hutt New Zealand	Tel: 64-4-560 9400 Fax: 64-4-566 2525 E-mail: bracefieldr@caa.govt.nz
Mr. Greg Atkins	ATS Manager Airways Corporation of New Zealand Ltd. P.O. Box 14-131 Christchurch New Zealand	Tel: 64-3-3581698 Fax: 64-3-3582790 E-mail: atkinsg@airways.co.nz
<b>PHILIPPINES</b>		
Mr. Anacleto V. Venturina	Director II Air Traffic Service Air Transportation Office Department of Transportation and Communications MIA Road, Pasay City- 1300, Philippines	Tel: 632-759 2742 Fax: 632-759 7138 E-mail: avv@ats.ato.gov.ph
Mr. Crisostomo Balucating	Director II Air Navigation Service Air Transportation Office Department of Transportation and Communications MIA Road, Pasay City- 1300 Philippines	Tel: 632-831 8083 Fax: 632-759 9501
Mr. Rolando Mendoza	Manager Flight Technical Division Flight Operations Department Philippine Airline FOD Building, PAL Gate 1 Andrews Avenue, Nichols Pasay City 1300 Philippines	Tel: 632-832 3347 Fax: 632-832 3599/832 3363 E-mail: ftdfod@pal.com.ph
Mr. Selino Jalalon	Supervisor Flight Technical Division Flight Operations Department Philippine Airline FOD Building, PAL Gate 1 Andrews Avenue, Nichols Pasay City 1300, Philippines	Tel: 632-832 3347 Fax: 632-832 3599 E-mail: ftdods@pal.com.ph

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>REPUBLIC OF KOREA</b>		
Mr. Kyun-Do Huh	Assistant Director Civil Aviation Bureau Ministry of Construction and Transportation 1 Joongang-Dong, Kwacheon-City Kyunggi-Do Republic of Korea	Tel: 82-2-504 9185 Fax: 82-2-503 7330 E-mail: kdjuh@moct.go.kr
Mr. Jin-Ik Lee	Director Korea Airports Authority 274 Gwahae-Dong, Gangseo-Gu Seoul 157-711 Republic of Korea	Tel: 82-2-660 2868 Fax: 82-2-660 4200 E-mail: jilee@airport.co.kr
Mr. Jong Seon Lee	Korea Airports Authority 274 Gwahae-Dong, Gangseo-Gu Seoul 157-711 Republic of Korea	Tel: 82-2-660 2868 Fax: 82-2-660 4200 E-mail: pobee@airport.co.kr
<b>RUSSIAN FEDERATION</b>		
Mr. Vladimir Korchagin	Head of Division State Civil Aviation Authority of Ministry of Transport of Russian Federation 37 Leningradsky Pr., Moscow, Russian Federation	Tel: (7-095) 155 58 14 Fax: (7-095) 155 53 3 E-mail: vkorchagin_h@mail.ru
Mr. Nikolay Silaev	Head Officer State Civil Aviation Authority of Ministry of Transport of Russian Federation 37 Leningradsky Pr., Moscow, Russian Federation	Tel: (7-095) 155 57 68 Fax: (7-095) 155 53 38 E-mail: office@technocom.civilavia.ru
<b>SINGAPORE</b>		
Mr. Kwek Chin Lin	Project Officer (Systems) Civil Aviation Authority of Singapore Singapore Air Traffic Control Centre 60 Biggin Hill Road Singapore 509950	Tel: 65-5412664 Fax: 65-5456252 E-mail: kwek_chin_lin@caas.gov.sg

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Ms. Wee Toon Cheng, Melisa	Engineer (Specialised Systems) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: 65-5412458 Fax: 65-5456516 E-mail: melisa_wee@caas.gov.sg
<b>THAILAND</b>		
Dr. Danai Lekhyananda	Senior Air Transport Economic Advisor Ministry of Transport and Communications Ratchadamnoen Nok Avenue Bangkok 10100, Thailand	Tel: 66-2-283 3139 Fax: 66-2-281 8958 E-mail: danai@motc.go.th
Mr. Nimitr Sritirat	Senior Electrical Engineer Air Navigation Facilities Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-287 2634 Fax: 66-2-287 2634 E-mail:
Mr. Suchart Hiranyabat	Senior Electrical Engineer Air Navigation Facilities Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-287 2634 Fax: 66-2-287 2634 E-mail: suchart_h@thaimail.com
Mr. Vanchai Srimongkol	Chief of Communication Branch Communication and Air Traffic Control Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-286 2909 Fax: 66-2-286 2909 E-mail: svanchai@aviation.go.th
Ms. Tawika Yodnuan	Air Transport Technical Officer Communication and Air Traffic Control Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-286 2909 Fax: 66-2-286 2909
Mr. Takashi Kuratomi	JICA Expert Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-286 4523, 287 0320 ext 1288 Mobile: (01) 755 3147 Fax: 66-2-286 4523 E-mail: kuratomi@aviation.go.th

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Capt. Werasak Wiroonpetch	Manager, International Aviation Affairs & Development Department Flight Operations Department Thai Airways International Public Co., Ltd. 89 Vibhavadi Rangsit Rd Bangkok 10900, Thailand	Tel: 66-2-545 2665 Fax: 66-2-545 3849 E-mail: werasak.w@thairways.co.th
Mr. Somkiat Prakitsuvan	Chief Flight Operations Officer Operations Department Thai Airways International Public Co.Ltd. 89 Vibhavadi Rangsit Rd Bangkok 10900, Thailand	Tel: 66-2-535 2450 Fax: 66-2-504 3815 E-mail: bkkop@thai.com
Mr. Raungsakdi Kalayanajati	Vice President, Business Systems Bureau Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-2859907 Fax: 66-2-2859997 E-mail: raungsakdi@aerothai.or.th
Mr. Somnuk Rongthong	Vice President, Air Traffic Service Engineering Bureau Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-285 9904 Fax: 66-2-287 8166 E-mail: somnuk@aerothai.or.th TLX: AEROT 82852 TH AFTN: VTBBYFYX SITA: BKKTOYF
Mr. Chainan Chaisompong	System Engineer Planning and Project Department Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-287 8391 Fax: 66-2-285 9486 E-mail: chainan.ch@aerothai.or.th TLX: AEROT 82852 TH AFTN: VTBYFYX SITA: BKKTOYF
<b>UNITED STATES</b>		
Mr. Dennis Beres	Asia/Pacific Representative, ASD-500 Research & Acquisitions International Division Federal Aviation Administration P.O. Box 50109 Honolulu, Hawaii 96850 U.S.A.	Tel: 1-808-541 1244 Fax: 1-808 541 3462 E-mail: dennis.beres@faa.gov

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Paul Bartko	International Program Officer, AAT-30 Air Traffic Services Federal Aviation Administration 800 Independence Ave S.W. Washington, D.C. 20591 U.S.A.	Tel: 1-202-267 8705 Fax: 1-202-267 5120 E-mail: paul.bartko@faa.gov
Mr. Allan Storm	Civil/Military Aviation Issues U.S. Air Force/Flight Standards Agency 1535 Command Dr, Suite D309 Andrews AFB, MD 20762 U.S.A.	Tel: 1-240-857 2146 Fax: 1-240-857 3194 E-mail: allan.storm@andrews.af.mil
<b>VIET NAM</b>		
Mr. Nguyen Van Thang	Manager Technical Division Vietnam Air Traffic Management Civil Aviation Administration of Vietnam Gialam Airport Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8 271 386 Fax: 84-4-8 272 597 E-mail: vatmtech@hn.vnn.vn
Mr. Bui Van Vo	Deputy Director Air Navigation and Air Transportation Department Civil Aviation Administration of Vietnam Gialam Airport – Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8274191 Fax: 84-4-8274194 E-mail: khongvan@vol.vnn.vn
<b>IATA</b>		
Capt. Neil Jonasson	Assistant Director Operations & Infrastructure – Asia/Pacific International Air Transport Association 77 Robinson Road #05-00, SIA Building Singapore 068896	Tel: 65-239 7262 Fax: 65-536 6267 E-mail: jonassonn@iata.org
Mr. Owen B. Dell	Manager International Operations Cathay Pacific Airways Limited International Affairs Department 9/F Central Tower, Cathay Pacific City 8 Scenic Road Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852 2747 5070 Fax: 852 2141 5070 SITA: HKGOOCX E-mail: owen_dell@cathay.pacific.com

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>IFALPA</b>		
Capt. Koichi Sano	Regional Vice President/North Pacific IFALPA 3-2-11 Higiriyama, Konan-ku Yokohama-shi 233-0015 Kanagawa Pref. Japan	Tel: 81-3-5756 3117 81-45-845 2154 Fax: 81-3-5756 0192 81-45-847 0363 E-mail: koichisano@jalmate.ne.jp Office@japan-alpa.gr.jp
<b>ICAO</b>		
Mr. John E. Richardson	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: jrichardson@bangkok.icao.int
Mr. K.P. Rimal	Regional Officer, CNS ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: krimal@bangkok.icao.int
Mr. Dave J. Moores	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: dmoores@bangkok.icao.int
Mr. Hiroshi Inoguchi	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: hinoguchi@bangkok.icao.int
Mr. Li Peng	Regional Officer, CNS ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: pli@bangkok.icao.int

**LIST OF WORKING AND INFORMATION PAPERS**

(Presented by the Secretariat)

**WORKING PAPERS**

<b>WP No.</b>	<b>Date</b>	<b>Agenda Item</b>	<b>Presented by</b>	<b>Subject</b>
1	30/7/01	1	Secretariat	Provisional Agenda
2	30/7/01	3	Secretariat	Preparation for World Radio Communication Conference 2003 (WRC-2003)
3	30/7/01	2	Secretariat	Action on Conclusions/Decisions of APANPIRG/11
4	30/7/01	10	Secretariat	CNS/ATM/IC/SG Terms of Reference and Work Programme
5	30/7/01	5	New Zealand	CNS/ATM Implementation — The Case for an Holistic Approach
6	30/7/01	4	Secretariat	Key CNS/ATM Implementation Priorities
7	30/7/01	9	Secretariat	List of Air Navigation Shortcomings and Deficiencies
8	30/7/01	8	Secretariat	Revised ASIA/PAC Regional Plan for the New CNS/ATM Systems
9	30/7/01	6	Secretariat	First Inter-Regional Co-ordination Meeting (IRCM/1) Asia/Pacific – Middle East – EUR/NAT Regional Offices
10	30/7/01	2	Secretariat	Result of the CNS/MET/SG/5 Meeting
11	30/7/01	3	Secretariat	CNS/ATM Implementation Planning Matrix
12	30/7/01	4	Secretariat	Transition to WGS-84 in the Asia/Pacific Region
13	31/7/01	3	Secretariat	Traffic Forecasts for Major Traffic Flows
14				<i>WITHDRAWN</i>
15	31/7/01	3	United States	Funding of Regional Monitoring Activities

**INFORMATION PAPERS**

<b>IP No.</b>	<b>Date</b>	<b>Agenda Item</b>	<b>Presented by</b>	<b>Subject</b>
1	30/7/01	-	Secretariat	List of Working and Information papers
2	30/7/01	3	Hong Kong, China	Development of Satellite-based CNS/ATM Systems in Hong Kong, China
3	30/7/01	5	New Zealand	The Business Case Approach to CNS/ATM Implementation – A Critique and a Way Forward
4	30/7/01	2	Secretariat	Subject and Task Lists from ATS/AIS/SAR/SG/11 and CNS/MET/5 Meetings
5	30/7/01	5	New Zealand	Airways Oceanic Control System
6	30/7/01	3	Secretariat	Implementation Status of CNS/ATM Systems
7	30/7/01	3	Secretariat	Strategies for the Provision of Precision Approach and Landing Guidance Systems and Implementation of GNSS
8	30/7/01	3	Secretariat	ASIA/PAC Checklist for Introduction of GNSS based Operations
9	30/7/01	-	Fiji	CNS/ATM Implementation Activities by Fiji
10	30/7/01	3	Bhutan	Information on CNS/ATM Implementation Activities
11	30/7/01	3	Russian Federation	Results of the recent research and trials, associated with the implementation of CNS/ATM systems in Russian Federation
12	30/7/01	3	Japan	Air Traffic Management Center Project
13	30/7/01	3	China	Progress of CNS/ATM Implementation and Related Activities in China
14	31/7/01	3	Mongolia	Automatic Dependent Surveillance ADS-C/ADS-B in Mongolia
15	31/7/01	3	Hong Kong, China	CNS/ATM Project Implementation Plan
16	31/7/01	-	Australia	Automatic Dependent Surveillance-Broadcast (ADS-B)
17	2/8/01	7	Secretariat	ASIA/PAC Basic ANP and FASID
18	2/8/01	3	Australia	Australian ATM Strategic Planning