International Civil Aviation Organization

ELEVENTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/11)

Bangkok, Thailand, 2 – 6 October 2000

Agenda Item 2: ASIA/PAC Air Navigation System and Related Activities

2.2 COM/MET/NAV/SUR SG/4 Report

REPORT OF THE FOURTH MEETING OF COMMUNICATION/METEOROLOGY/NAVIGATION/SURVEILLANCE SUB-GROUP (COM/MET/NAV/SUR SG/4)

(Presented by the Chairman, COM/MET/NAV/SUR Sub-Group)

SUMMARY

This paper presents a report of the Fourth Meeting of the COM/MET/NAV/SUR Sub-Group for review and appropriate action.

1. **Introduction**

1.1 The fourth meeting of COM/MET/NAV/SUR Sub-Group was held in Bangkok from 17 to 21 July 2000. The meeting was attended by 86 experts from 18 States, two International Organizations and 2 communication service providers.

2. **Discussion**

2.1 The meeting formulated 3 draft Decisions, 2 Decisions and 19 draft Conclusions.

2.2 The report of the COM/MET/NAV/SUR SG/4 is provided in Attachment to this working paper.

3. **Action by the Meeting**

3.1 The APANPIRG/11 is expected to:

i) review report of the COM/MET/NAV/SUR SG/4 meeting; and

ii) take actions with respect to the draft Decisions and draft Conclusions formulated by the COM/MET/NAV/SUR SG/4 meeting.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

REPORT OF THE FOURTH MEETING OF COMMUNICATIONS/METEOROLOGY/NAVIGATION/SURVEILLANCE SUB-GROUP (COM/MET/NAV/SUR SG/4) OF APANPIRG

BANGKOK, THAILAND 17 – 21 JULY 2000

Approved by the Meeting
and published by the ICAO Asia and Pacific Office

The views expressed in this Report should be taken as those of the Sub-Group and not of the Organization. This Report will be submitted to the APANPIRG/11 Meeting and any formal action taken will be published in due course as a Supplement to the Report of the APANPIRG Meeting.

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1. Introduction

1.1 The Fourth Meeting of the Communications/Meteorology/Navigation/Surveillance (COM/MET/NAV/SUR) Sub-Group of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held in Bangkok, Thailand from 17 to 21 July 2000.

2. Attendance

2.1 The meeting was attended by 86 experts from eighteen States, two International Organizations and two communication service providers. A list of participants is in Attachment 1.

3. Opening of the Meeting

3.1 Mr. K.P. Rimal, on behalf of Mr. Lalit B. Shah, Regional Director, ICAO Asia and Pacific Office, welcomed all participants to Bangkok and provided an overview of all the developments taken place in the CNS and MET fields since the last meeting.

3.2 Mr. Jeffrey Bollard, Chief Engineer of Airservices Australia, opened the meeting and highlighted the objective of the meeting.

4. Officers and Secretariat

4.1 Mr. Jeffrey Bollard, Chairman of the Sub-Group presided over the meeting.

4.2 Mr. K .P. Rimal, Regional Officer, CNS acted as Secretary of the meeting who was assisted by Mr. E.P. Lysakov, Regional Officer, Aeronautical Meteorology, and Mr. Li Peng, Regional Officer, CNS of the ICAO Asia and Pacific Office, Bangkok.

5. Agenda of the Meeting

5.1 The agenda adopted by the meeting was as follows:

Agenda Item 1:	Review: a) Terms of Reference and Subject /Tasks List of the COM/MET/NAV/SUR SG b) status of actions on the report of the COM/MET/NAV/SUR SG/3 Meeting
Agenda Item 2:	Shortcomings and deficiencies in the COM/MET/NAV/SUR fields
Agenda Item 3:	Implementation of Aeronautical Fixed Service (AFS) communications requirements
Agenda Item 4:	ATN transition planning

Agenda Item 5: Implementation of Aeronautical Mobile Service (AMS) plan and consideration of issues relating to transition to VHF Digital Link (VDL)

Agenda Item 6: Review:
a) strategy for the provision of Precision Approach and Landing Guidance Systems
b) GNSS strategy

Agenda Item 7: Review:
a) implementation of the ISCS and SADIS
b) transition to the final phase of WAFS

Agenda Item 8: Exchange of OPMET information

Agenda Item 9: Implementation of international airways volcano watch

Agenda Item 10: Update the CNS and MET parts of ASIA/PAC FASID

Agenda Item 11: Future Work Programme

Agenda Item 12: Any other business

6. Organization, Working arrangement, language and documentation

6.1 The working language was English inclusive of all documentation and this report. A list of Working Papers and Information Papers presented at the meeting is at Attachment 2.

7. TERMS OF REFERENCE OF THE COM/MET/NAV/SUR SUB-GROUP

7.1 The Terms of Reference of the Sub-Group are as follows:

Terms of Reference

1. Ensure the continuing and coherent development of the ASIA/PAC Regional Air Navigation Plan in the COM/MET/NAV/SUR fields including the new CNS/ATM systems for the provision of the required air navigation services and facilities.

2. Review and identify shortcomings or deficiencies that impede implementation or affect provisions of efficient Communications and Meteorological (COM/MET) services and Navigation and Surveillance (NAV/SUR) services.

3. Make specific recommendations aimed at improving COM/MET/NAV/SUR services by the use of existing procedures and facilities and/or, through evolutionary introduction of the CNS/ATM systems.

4. Review planning and implementation process associated with precision approach and landing systems.

8. **Conclusions and Decisions - Definition**

8.1 The COM/MET/NAV/SUR Sub-Group of APANPIRG records its actions in the form of draft conclusions and decisions with the following significance:

a) Draft Conclusions deal with matters which, in accordance with the Sub-Group's Terms of Reference, require the attention of States or actions by ICAO in accordance with established procedures;

b) Draft Decisions relate solely to matters dealing with the internal working arrangements of APANPIRG and its contributory bodies; and

c) Decisions relate solely to matters dealing with internal working arrangement of the COM/MET/NAV/SUR Sub-Group only.

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Agenda Item 1: Review:
a) Terms of Reference and Subject/Tasks List of the COM/MET/NAV/SUR Sub-Group
b) Status of Actions on the Report of the COM/MET/NAV/SUR Sub-Group/3 Meeting

Terms of Reference and Subject /Tasks List of the COM/MET/NAV/SUR Sub-Group

1.1 The meeting reviewed the Title, Terms of Reference (TOR) and Subject/Tasks List of the COM/MET/NAV/SUR Sub-Group. The meeting proposed amendments to the Title and TOR in line with amendments proposed by the APANPIRG Sub-Group Work Programme Review Task Force and updated the Subject/Tasks List to indicate the progress of work made so far. It was noted that of the 35 Tasks, 25 Tasks were completed and two Tasks: one in the CNS and one in MET fields were added. The proposed amendments to the Title and the TOR of the Sub-Group and updated Subject/Tasks List are provided in Appendix A. The meeting formulated the following draft decision for adoption of the proposed amendments.

Draft Decision 4/1 - Amendments to the Title, Terms of Reference and Subject/Tasks List

That, proposed amendments to the Title, Terms of Reference and the Subject/Tasks List of the COM/MET/NAV/SUR Sub-Group presented in Appendix A be adopted.

Status of Actions on the Report of the COM/MET/NAV/SUR SG/3 Meeting

1.2 The meeting carried out a review of the actions taken by APANPIRG, Air Navigation Commission and the Council on Decisions and Conclusions formulated by the Third Meeting of the Sub-Group. Actions taken by States and the ICAO Secretariat were also reviewed. The Meeting noted with satisfaction actions taken on all the Decisions and Conclusions of the meeting. The results of the review in the CNS and MET fields are provided in Appendices B and C, respectively.

Outstanding Conclusions

1.3 The meeting reviewed the status of implementation of the outstanding Conclusions of APANPIRG. It was noted with appreciation that of the 18 outstanding Conclusions, action on 11 Conclusions were completed. Actions on 2 Conclusions were expected to be completed by October 2000 and the remaining 5 Conclusions were yet to be completed. The list of outstanding Conclusions was updated and provided in Appendix D.

APANPIRG Sub-Group Work Programme Review Task Force

1.4 The meeting noted that the APANPIRG/10 had recognized the need to develop a consolidated action plan to reflect the present and future activities of APANPIRG Sub-Groups and established the APANPIRG Sub-Group Work Programme Review Task Force in its Decision 10/45.

1.5 It was noted that the Task Force met in Bangkok from 20 to 22 March 2000. The Task Force recommended that the CNS/ATM IC Sub-Group be dissolved and the existing Sub-Groups be renamed as ATM/AIS/SAR and CNS/MET Sub Groups. It was proposed that the planning and implementation aspects of the new CNS/ATM systems including Key Priorities should be addressed by the two Sub-Groups in their respective fields. In addition, the task of inter-regional co-ordination was included in the proposed TOR of the two Sub-Groups.

1.6 The report of the Task Force was presented in detail. The Sub-Group considered the proposed changes and also noted the changes proposed in the TORs of the Sub-Groups. After a careful consideration the meeting supported the recommendations made by the Task Force.

Key Priorities in the CNS/ATM Implementation

1.7 The meeting reviewed the Key Priorities and proposed the following changes for consideration by APANPIRG.

- Deletion of "ATN Transition" - Item completed.
- Deletion of "GNSS Frequency Protection" as the described work has been completed.
- Deletion of "Y2K and GPS Z Count" – Item has been completed and the time of applicability has now past.
- Deletion of "Updating of Major Geographical Areas"- This item was considered an on-going task and not considered appropriate for inclusion into the Key Priorities.
- Addition of "Preparation for WRC-2003"

1.8 It was observed that the "WGS-84 Implementation" was generally implemented within the Region and that States which have not completed implementation were now identified in the List of the Air Navigation Shortcomings and Deficiencies. It was, however, accepted that WGS-84 implementation was a corner stone to the progression of CNS/ATM and the meeting agreed to retain the item in the Key Priorities.

1.9 It was agreed that, where possible, items entered as Key Priorities should have definitive target dates. It was also agreed that the use of the term "on-going" should be avoided. The proposed amendments have been marked up and provided in Appendix E. The meeting proposed these changes for consideration by APANPIRG and formulated the following draft decision.

Drafts Decision 4/2 - Amendments of the Key Priorities

That, the Key Priorities be amended as shown in Appendix E.

Agenda Item 2: Shortcomings and Deficiencies in the COM/MET/NAV/SUR Fields

2.1 The meeting noted that ICAO Assembly Resolution A 32-14, Appendix M calls for States to give priority to the implementation of those facilities and services, the lack of which, would likely to have a serious effect on international air operations. The Assembly Resolution also directs ICAO to carry out identification, investigation and action on important shortcomings in the implementation of Regional Plans within a minimum practical time, and that the Planning and Implementation Regional Groups (PIRGs) shall identify problems and shortcomings in Regional Plans and the implementation thereof, along with suggested remedial measures. In accordance with the above directive, APANPIRG has prepared a list of shortcomings and deficiencies. The list of shortcomings and deficiencies in the CNS and MET fields were reviewed. It was noted that a number of follow up actions were taken with States concerned for implementation. The meeting noted that, of the 9 shortcomings/deficiencies identified in the list, the States concerned corrected 4. The meeting expressed appreciation to those States who had taken timely action and corrected the shortcomings/deficiencies.

2.2 It was noted that the list was presented to the 12th Meeting of Bay of Bengal ATS Co-ordination Group held in Bangkok from 5 to 9 June 2000 and the status was updated. With regard to the scalloping problem of Kathmandu VOR, IFALPA confirmed that the problem has been corrected but the Jeppesen Chart still indicates that there is scalloping problem. It was agreed that the Secretariat would bring this matter to the attention of the Administration for necessary corrective action.

2.3 An updated list of shortcomings and deficiencies in the CNS and MET fields is provided in Appendix F.

Agenda Item 3: Implementation of Aeronautical Fixed Service (AFS) communications requirements

3.1 Under this agenda item, the meeting reviewed the implementation status of Aeronautical Fixed Service (AFS) communications in the of Bay of Bengal and South East Asia areas. The requirement for upgrading AFTN and ATS direct speech circuits in the other areas of Asia/Pacific Region was also reviewed. The meeting noted that substantial progress was made during 1999 and early 2000 in implementing and upgrading AFTN and ATS direct speech circuits in the ASIA/PAC region. The main highlights of the AFS communications improvements were as follows:

AFTN circuits

- Hong Kong/Taipei AFTN circuit was upgraded from dual 75 baud to 4800bps using X.25 protocol since 15 June 1999;

-Bangkok/Hong Kong AFTN Circuit was upgraded to 2400 bps from 1200 bps using X.25 protocol since 5 July 1999;

-The Bangkok/Dhaka AFTN circuit was upgraded from 50 baud to 300 baud, No protocol, using VSAT link since 15 October 1999;

-Tokyo/Seoul AFTN circuit was upgraded from 1200 bps to 9600 bps since 20 October 1999;

-Tokyo/Naha AFTN circuit was upgraded to 9600 bps from 2400 bps since 20 October 1999;

-Bangkok/Mumbai AFTN circuit was upgraded from 300 baud to 2400 bps using X.25 protocol since 7 December 1999;

-Bangkok/Singapore AFTN circuit was upgraded to 1200 bps using X.25 protocol since 1 February 1999;

-Tokyo/Khabarovsk circuit was upgraded from 200 baud to 2400 bps since 13 April 2000;

-Ho Chi Minh/Vientiane AFTN circuit was upgraded to 9600 bps using VSAT by the end of 1999.

- Nadi/Noumea AFTN circuit was upgraded from 75 baud to 2400 bps in June 2000.

AFTN stations and COM Centres

- A new AMSS MESSIR supporting X.25 protocol was put into operation at Colombo, Sri Lanka on 6 April 2000;

-New AMSS MESSIR Proliaut1000 was implemented at Dhaka, Bangladesh in 1999;

-New AMSS – ECIL was implemented at Kathmandu, Nepal since 12 July 2000.

ATS Direct Speech Circuits

- Hanoi/Vientiane was implemented during the end of 1999;
- Ho Chi Minh/Vientiane circuit was implemented during the end of 1999;
- Ho Chi Minh/Phnom Penh circuit was implemented during the end of 1999;
- Dhaka/Yangon circuit using VSAT was implemented in October 1999;
- Kunming/Vientiane circuit using VSAT was implemented in May 1999.
- Japan/U.S.A circuits using PSS1 was established in March 1999 and expanded in March 2000.

Implementation plan

3.2 The meeting was informed that the target date for upgrading capacity of the three AFTN circuits were established as follows:

1. Mumbai/Colombo	2400 bps, X.25, 12/2000
2. Colombo/Singapore	2400 bps, X.25, 12/2000
3. Jakarta/Singapore	2400 bps, X.25, 12/2000

3.3 It was informed that Beijing/Khabarovsk 2400 bps AFTN circuit would be established, using satellite digital data transmission channel by the end of September 2000.

3.4 It was noted that the Calcutta/Dhaka AFTN HF-RTT circuit was unreliable. It is the only radio teletype circuit in operation in the ASIA/PAC region. It was, therefore, considered essential to upgrade the circuit without delay. It was informed that both Bangladesh and India agreed to upgrade the existing 50 baud HF RTT to LTT circuit through microwave link within three months upon receipt of feasibility report from Telecomm Authority of Bangladesh.

3.5 The meeting was informed that the Calcutta/Mumbai AFTN circuit is expected to be upgraded from two 50 baud to two 9600 bps circuits by September 2000 and will be in normal operation in December 2000. It was suggested that change in the routing of messages between Dhaka and Calcutta could be made via Dhaka/Bangkok/Mumbai/Calcutta, as an interim arrangement, in the event of any delay in upgrading the Dhaka/Calcutta HF RTT circuit to the LTT circuit or establishment of satellite link between Dhaka and Calcutta.

3.6 Sri Lanka had proposed to use X.25 Permanent Virtual Circuit (PVC) provided by common carrier services to upgrade the Colombo/Mumbai AFTN circuit to 2400 bps and India agreed to use PVC service to upgrade the circuit. India and Sri Lanka agreed to coordinate with respective common carrier agencies and finalize mutually agreed arrangement to upgrade the circuit.

3.7 Sri Lanka expressed readiness to upgrade the Colombo/Male AFTN circuits using X.25 PVC. Singapore agreed to investigate the possibility of using X.25 PVC to upgrade the Colombo/Singapore AFTN circuit. It was also agreed that the Secretariat would co-ordinate with Maldives, the proposal made by Sri Lanka to upgrade the Colombo/Male AFTN circuit to 2400 bps.

3.8 Considering that the Tokyo/Seoul AFTN circuit has been upgraded and the new Beijing/Seoul circuit will be established by the end of 2001, Japan informed the meeting that the Tokyo/Taegue AFTN circuit, which was established under bi-lateral agreement to serve as an alternate routing for the Tokyo/Seoul circuit, will be withdrawn upon establishment of the Beijing/Seoul circuit. The details of the alternate routing arrangement for the Tokyo/Seoul and the Beijing/Seoul circuits are required to be coordinated between States concerned and with the Asia/Pacific Regional Office. It was agreed that co-ordination of the routing would be carried out well ahead of implementation of the Beijing/Seoul circuit.

3.9 The meeting was also advised that an IDD hotline was established between Colombo and Trivandrum for ATS communication and is operating satisfactorily.

3.10 In view of the experience gained, India had proposed to enhance the performance of the existing IDD service used for the Calcutta/Dhaka ATS direct speech communication by providing IDD Hotlines at both ends. It was agreed that Bangladesh would take up this matter with their telecommunication authority to provide IDD Hotline at Dhaka.

3.11 Due to the increase in traffic volume DCA Malaysia and CAA Vietnam have agreed to upgrade the existing IDD circuit to direct speech link and data link by using VSAT. The above circuit is scheduled to be established by the end of 2000.

Improvement of Backbone Circuits

3.12 Russian Federation provided information on the use of Frame Relay protocol and X.25 protocol on various domestic data channels to support both data and voice communications. The meeting also noted that switching nodes supporting X.25/Frame Relay protocols are used at Moscow and used at Moscow and Khabarovsk communication centers interconnected by the

Russian national civil aviation network, using digital data transmission channels at speed of 64 kbps. The Moscow/Frankfurt AFTN circuit is planned to be upgraded to 64 kbps by the end of 2000.

3.13 The meeting noted that a dedicated Frame Relay network was put into operation in March 2000 in China. This network at its first stage introduced 16 nodes interconnected by trunk lines provided with satellite and DDN circuits at speed of 64 kbps. The network supports several communication protocols including Frame Relay and X.25 and provides AFS communication for larger and medium-sized airports in China. It will be used as the backbone internet communication service for the ground- to-ground element of ATN in China.

3.14 Japan presented the current status of implementation of PSS1 speech circuit between FAA and JCAB. The PSS1 signalling system was introduced in March 1999. The system was expanded in March 2000 in accordance with Asia/Pacific Regional Interface Control Document (ICD) for ATS digital speech signalling system and connected with Air Traffic Flow Management Centre (ATFMC). This 64 kbps circuit use compressed technology and provides, at present, one D channel and three B channels for ATS voice communications between ACC centres of States. The advantages for using PSS1 signalling system are: failure detection/automatic detour; routing by dial number and caller number identification.

3.15 Based on the information provided on available and emerging digital circuits or networks implemented in Russian Federation, China and Japan, the meeting considered it necessary to recommend the use of digital communication network or circuits to support AFS communications requirements. The meeting, therefore, formulated the following draft conclusion:

Draft Conclusion 4/3 - Use of digital circuits

That, States consider implementing digital communication networks or circuits in a co-ordinated manner in order to meet current and future AFS communication requirements for data/voice communications and to facilitate the introduction of ATN.

3.16 Mongolia informed the meeting that in order to provide reliable aeronautical mobile service communication to the new ATS route B330, RCAG ER VHF station has been installed in the southern part of Mongolia. The extended range VHF provides coverage to all the existing and new ATS routes passing through Mongolian airspace from China.

3.17 Mongolia expressed concerns that unreliable HF communication used between Ulaanbatar ATC centre and Kizyl is not meeting operational requirements and needs improvement. In order to improve the existing HF communication between stations in Mongolia and Russian Federation, both the Administrations had agreed to hold bi-lateral discussion on organizational issue during this year and implement technical solution in 2001. The expert from Mongolia also expressed the need to make alternative communication arrangement for a critical VSAT station, which is shared for several AFS circuits. The meeting was informed that VSAT is one of reliable means of communications employed by several States in the Region to support AFS communication. However, spare parts for critical modules and elements such as redundant channel cards, RF unit should be readily available for replacement to ensure rapid restoration during breakdown. The reliable power supply should also be provided. It was

recognize that for those VSAT stations providing both ATS direct speech and critical AFTN circuits without the provision of an alternate routing between States, an alternative communication link should be provided. In light of above consideration, the meeting formulated the following draft conclusion.

Draft Conclusion 4/4 - Alternative arrangements for VSAT

That, States consider the provision of an alternative communication links for

a) critical AFS communications which are supported by a single VSAT system between States; and

b) remote control air-ground (RCAG) VHF stations supported by a single VSAT link.

Communication Circuit Performance

3.18 The United States had provided information on the AFTN circuit loading statistics for the USA/Brisbane, Nadi, and Tokyo AFTN circuits. The loading was well within the acceptable limits. With respect to the USA/Brisbane circuit the loading indicated that any additional traffic expected to be generated during the Olympic games in Sydney can be satisfactorily met.

3.19 Japan provided circuit loading statistics, which were collected in the first 10 days of June 2000 for all the AFTN circuits. Review of the statistics indicated a decreasing trend for the Tokyo/Singapore circuit compared with statistics collected in February 2000. It was, however, considered desirable to monitor the circuit loading on a regular basis. The hourly loading on the Tokyo/Moscow circuit showed higher than 40 percent occupancy level indicating the need for upgrading the circuit. Japan and the Russian Federation agreed to upgrade the existing circuit using a digital link for the Tokyo/Moscow circuit in 2003.

3.20 The meeting noted that the loading condition on the Kuala Lumpur/Chennai AFTN circuit was required to be closely monitored. It is also required to plan timely upgrade of the circuit before the overloading situation occurs. In view of the above India and Malaysia agreed to upgrade the existing Chennai/Kuala Lumpur circuit to 2400 bps by using X.25 protocol. It is scheduled to be implemented by end of 2001.

3.21 The meeting was informed that the VSAT link used for ATS direct speech circuit between Kunming and Yangon had been out of order due to technical and other problems at Yangon site and an IDD service is used temporarily. The meeting urged States concerned to take urgent actions to reactivate the speech circuit and implement the AFTN circuit between Kunming and Yangon.

Amendment to the AFTN entry/exit Points

3.22 The meeting noted a proposal made by New Zealand to review and amend the entry/exit points between ASIA/PAC regions and adjacent regions. The entry/exit points between ASIA and PAC specified in the ASIA/PAC ANP should be deleted as the ASIA and PAC regions are considered as single ASIA/PAC region for AFTN operation. In addition, Tokyo is functioning as an entry/exit point between ASIA/PAC and NAM regions, it is, therefore, required to add Tokyo as an entry/exit point. The meeting endorsed the proposal presented for an amendment to ASIA/PAC ANP to delete entry/exit points between ASIA and PAC regions. In addition, in Chart COM 1 in ASIA/PAC ANP, the entry/exit point between ASIA/PAC and NAM, CAR is shown via USA (Honolulu). Since the routing is via Salt Lake City or Atlanta, Georgia, it was mentioned USA in the Chart instead of a specific location of the AFTN COM Centre. It is, therefore, proposed to delete reference to Honolulu in Chart COM 1. In view of the foregoing, the meeting endorsed the draft conclusion as follows:

Draft Conclusion 4/5– Amendment to ASIA/PAC ANP

That, the ASIA/PAC ANP be amended as follows:

1) the entry/exit points:

a) between ASIA/PAC and AFI should be Mumbai and Brisbane;

b) between ASIA/PAC and EUR should be Bangkok, Singapore and Tokyo;

c) between ASIA/PAC and MID should be Mumbai, Singapore and Karachi;

d) between ASIA/PAC and NAM should be Nadi, Brisbane and Tokyo;

e) between ASIA/PAC and SAM should be Brisbane.

2) delete reference to Honolulu in Chart COM 1

3.23 The meeting reviewed and further updated the status of upgrading capacity of AFTN circuits specified in the Table CNS 1A - AFTN Plan. The updated plan with target dates of upgrading of various circuits is provided in Appendix G.

Agenda Item 4: ATN Transition Planning

4.1 Under this agenda item the meeting conducted a review of the results of the Second Meeting of the ATN Transition Task Force held in Chiang Mai, Thailand from 6 to 10 March 2000.

4.2 The meeting was attended by forty-four experts from Australia, China, Hong Kong (China), India, Indonesia, Japan, New Zealand, and Republic of Korea, Russian Federation, Singapore, Sri Lanka, Thailand, United States and IATA.

4.3 The meeting reviewed the Terms of Reference (TOR) of the Task Force. It did not recognize the need to propose any changes to the TOR. The meeting carried out a thorough review of the Subject/Tasks List and noted that Task No. 1 relating to the development of the ATN Transition Guidance Material had been completed.

4.4 The meeting noted that the Task No. 5, relating to "Integrated Digital Voice/Data Transmission Network to Support ATM" required development of a connectivity plan for integrated voice/data trunk circuits. This Task was identified to address problem associated with implementation of dedicated low speed AFTN circuits and ATS direct speech circuits by introducing higher speed and multiplexing technique. As States were carrying out this Task, where required, on a bilateral basis, it was not considered necessary to develop a connectivity plan for the region. In view of this, the meeting supported the recommendation made by the Task Force to delete item 5 from the Task List.

4.5 The meeting also updated the Subject/Tasks List in light of the amendment proposed above and renumbered the items in the Tasks List and formulated the following draft decision:

Draft Decision 4/6 - Revision of the Subject/Tasks List

That, the updated Subject/Tasks List of the ATN Transition Task Force be adopted as shown in Appendix H.

Development of Regional ATN Planning Documents

4.6 The meeting noted that the ATN Transition Task Force had established Working Group A to deal with the task to develop the ATN planning documents which will be completed for presentation to the third meeting of the Task Force in March 2001.

4.7 It was also noted that in accordance with the Tasks List, the Task Force had established a Working Group B to develop the following documents.

ATN Ground Transition Plan including air-ground aspects, and
ATN Technical Document (s) on
- Security
- Performance
- System Management

4.8 The result of the Working Group B will also be presented to the third meeting of the Task Force in 2001.

Amendment to the ASIA/PAC Regional Plan for the New CNS/ATM System and the Guidance Material for Ground-Ground Elements in ATN Transition

4.9 The meeting reviewed proposals developed by the expert from Japan to amend Chapters 5 and 7 of the ASIA/PAC Regional Plan for the new CNS/ATM Systems and the Guidance Material for Ground Elements in ATN Transition to conform to the changes made to the core SARPs and Edition 3 of ICAO DOC 9705 (Manual for Technical Provisions of ATN).

4.10 The proposed changes were referred to the ATN Working Group for review and comment. The Working Group conducted a thorough review and updated the documents. The updated documents were endorsed by the Sub-Group. It was also agreed to publish Issue 2 of the Guidance Material incorporating agreed changes. The meeting commended the work done by the expert from Japan, Rapporteur of the Task Force and the Members of the ATN Working Groups to update Chapters 5 and 7 of the Regional Plan and the Guidance Material.

4.11 The proposed amendments to Chapters 5 and 7 of the Regional Plan provided in Appendix I were agreed and the following draft conclusion was formulated.

Draft Conclusion 4/7 - Amendments to Chapter 5 and 7 of the ASIA/PAC Regional Plan for the New CNS/ATM Systems relating to ATN Transition and the Guidance Material for Ground Elements in ATN Transition

That,

a) proposed amendments to Chapters 5 and 7 of the Asia/PAC Regional Plan for the New CNS/ATM System provided in Appendix I be adopted; and

b) the updated Guidance Material for Ground Elements in ATN Transition be published as Issue 2.

ATN Tables for the Ground-to-Ground Part of the CNS FASID

4.12 The meeting noted that the Task Force had reviewed the format and contents of the ATN Table CNS-1B adopted by the CAR/SAM/3 RAN Meeting held in 1999 and noted that the Table was similar to the Table CNS-1B developed by APANPIRG/9 meeting held in August 1998. It was recognized that the ATN Table would serve as a useful management tool to facilitate planning and implementation activities. Three Tables were developed in order to keep the information simple and to avoid duplication. In view of this, the Task Force had proposed to replace the existing format of the ATN Tables with the new Tables for the following plans:

i) ATN Router Plan
ii) AMHS Routing Plan
iii) AIDC Routing Plan

4.13 The meeting endorsed the proposal developed by the Task Force. Subsequently, the Tables were incorporated in the ASIA/PAC FASID to reflect the details required for the above plans.

Review Outcome of ATNP/3 Meeting

4.14 The meeting noted information provided by Australia regarding the outcome of the Third Meeting of the ATN Panel, which was held in Montreal from 7 to 18 February 2000. The main points that were outlined included the provisional acceptance of Edition 3 of DOC 9705 that provides new provisions for ATN Security, Systems Management and Directory Services. Other changes noted were the deletion of the AMHS Pass-Through service and the inclusion of the CIDIN/AFTN gateway application. The presentation provided an overview of ATN activities that were happening around the globe and the meeting was advised that every opportunity should be used to invite wider participation in implementation of ATN programs by all interested parties. The meeting was also advised that CPDLC and AMHS were identified as two ATN applications, which would yield significant operational benefits both in air and ground domains, when implemented on a global or at least regional scale. The presentation provided details of the future work program of the ATN Panel including the activities that will be performed by the Working Group of the Whole, 4th meeting, to be held in Berlin from 21 August to 1 September 2000.

Problem in Implementation of Low Speed Telegraph Circuits

4.15 It was also noted that some States in the Pacific Islands have been experiencing difficulties in retaining AFTN telegraph circuits as the common carrier agencies no longer provide low speed telegraph circuit. The lowest bandwidth available of the leased channel was 64 kbps. During the discussion on this issue, New Zealand informed that the Christchurch/Niue 300 baud AFTN circuit had to be withdrawn and FAX was used to exchange operational messages as there was no other option or alternative communication means available.

4.16 The meeting recognized that as an alternative means SITA service should be utilized as was done for Brisbane/Port-Vila circuit. Where SITA/ARINC services are not available, dial-up communication means could be considered.

4.17 IATA and SITA agreed to investigate the possibility of supporting the low speed AFTN circuits in the PAC region by SITA, where feasible, and advise the Regional Office prior to the APANPIRG/11 meeting.

ATN Seminar

4.18 The meeting recognized the need to generate more awareness of the ATN in the region in order to facilitate early implementation and proposed to conduct ATN Seminar for two days ahead of the third meeting of the Task Force. It was noted that the proposal is in line with Task List No.36 and the key priorities which call for convening of workshops and seminars to keep all States informed on

developments on trail and demonstrations. It was expected that States where elements of ATN are implemented or are being implemented, would be able to provide speakers to the Seminar. The ICAO Regional Office was requested to issue invitation letters to all States in the Asia and Pacific regions and concerned States in the adjacent region to attend the Seminar. The meeting endorsed the proposal made by the Task Force for convening the Seminar and formulated the following draft conclusion.

Draft Conclusion 4/8 – ATN Seminar

That,

a) ATN Seminar be conducted by ICAO prior to the Third ATN Transition Task Force meeting in 2001;

b) Invitation be extended to all the States in the ASIA/PAC region and States in the adjacent Region to attend the Seminar; and

c) States, in a position to do so, provide speakers to the Seminar.

4.19 The meeting recognized the need for the Third Meeting of the ATN Transition Task Force to be held prior to the COM/MET/NAV/SUR SG/5 meeting in 2001. The meeting was pleased to note the offer made by Singapore to host the meeting during March 2001. The exact date and venue of the meeting will be advised to the Secretary of the Task Force by the expert from Singapore in due course in order to notify Task Force Members for advance planning.

4.20 The meeting noted that the Republic of Korea has launched an AMHS project in December 1999 and it will be completed by the end of 2001. Their program involves integrating their AFTN and AIS automation systems by using Frame Relay as a wide area network throughout the country. Domestic AMHS testing is planned for September 2001 with normal operations to begin after a three-month trial period.

4.21 Japan provided details on their AMHS development and implementation programme, which detailed a number of tests that have already been conducted between JCAB and Australia during November 1999 through to May 2000. AMHS trials with Hong Kong China, the Republic of Korea and the USA are also planned in 2001 through to 2003.

4.22 It was also noted that the delivery of AMHS trial equipment to Hong Kong, China, is expected in March 2001 and a test with JCAB is expected to commence as early as April/May 2001.

Agenda Item 5: Implementation of Aeronautical Mobile Service (AMS) plan and consideration of issues relating to transition to VHF Digital Link (VDL)

Frequency congestion problem on MWARA SEA-3 network

5.1 The meeting was informed that congestion problem on SEA-3 MWARA Network frequency 11396 kHz was reported. Co-ordination was carried out by the Secretariat with States concerned to explore the possibility of alleviating congestion problem by introducing frequency 11297 kHz in SEA-2 network, where feasible, and designating 11396 kHz as secondary frequency in that network. Hong Kong, China had carried out test for 3 weeks. The test result was satisfactory and it was also found that the frequency 11297 kHz, which is allocated to SEA-2 network, is not used widely by all the stations of the network. In view of the suitability of the frequency, it was agreed to use 11297 kHz as a primary frequency and 11396 kHz as one of the secondary frequencies in the SEA –2 MWARA network by all stations with immediate effect. This action will alleviate congestion on 11396 kHz of the SEA-3 MWARA network. The Secretariat would advise States operating SEA-2 frequencies to take appropriate action in accordance with agreement reached at the meeting.

Proposal to include SIGMET in HF VOLMET broadcast

5.2 The meeting noted that in accordance with Conclusion 10/3 of APANPIRG, States concerned were consulted informally to seek their comments to ascertain if SIGMET can be included in ASIA HF VOLMET broadcast prior to circulating a proposal for amendment to the ASIA/PAC Air Navigation Plan. The meeting noted that States comments were reviewed by the ATS/AIS/SAR SG/10 Meeting and found that some States had expressed difficulty in including SIGMET in VOLMET due to time constraints, whereas most States indicated no-objection to the proposed change. It was agreed at the ATS/AIS/SAR SG/10 Meeting, that IATA would seek its member airlines preference and select aerodromes, MET information of which may be omitted from VOLMET broadcasts, if full SIGMET information is included in the broadcast.

Transition from ACARS to ATN

5.3 SITA provided the meeting with a briefing on its transition plan from the existing ACARS service to new data link services. This transition is to support ATS applications in addition to enhancing the performance of airline communications. The transition will see a two steps process with the interim step being the use of ACARS over Aviation VHF Link Control (AVLC) before the full ATN implementation.

5.4 Initial deployment will see the upgrading of existing ACARS sites with priority determined by the user community. Coverage expected at the end of 2001 and the expanded coverage expected by the end of 2003 were illustrated on world coverage maps.

Safe Flight 21

5.5 A status report was provided by the United States on its Safe Flight 21 programme. The programme seeks to demonstrate increased capacity, improved efficiency and resolution of safety problems through the use new communications, navigation and surveillance applications. The two areas of demonstration and evaluation are large air carriers from the Cargo Airlines Association in the Ohio River Valley and smaller general aviation-type commercial carriers in Bethel, Alaska.

5.6 The programme has demonstrated to date that there are several near term benefits which will provide significant safety, efficiency and capacity benefits. These benefits, together with others yet to be demonstrated, will be evaluated for suitability for national application.

VDL Research and Development

5.7 The meeting was informed of planning and research and development activities by Japan in the field of VHF Digital Link (VDL) applications. Planning of ATN implementation is being undertaken jointly by JCAB and Air Traffic Service Research Institute (ATSRI). The aim is to ensure consistent implementation of the ATN including VDL.

5.8 Research and development is being undertaken by the Electronic Navigation Research Institute (ENRI). ENRI has previously researched VDL Mode 2 and vocoders for Mode 3. Starting in the 2000 fiscal year ENRI will undertake a five-year programme looking at VDL Mode 3. This will involve testing a two voice/two data channels implementation with ground stations, aircraft station and ground vehicle. Performance to be evaluated will include bit error rates, transfer delays, data throughput and voice quality.

ATS (FANS) Route L888

5.9 A new CNS/ATM route is being implemented through western China utilizing the first application in China of the ICAO CNS/ATM concept and FANS technology. The route leads from Southeast Asia to Europe and is about 40 minutes shorter than the existing routes from Asia to Europe crossing the Indian sub-continent and the Middle East. The route also avoids the congestion of the existing routes.

5.10 Features of the new route are:

- Procedure control will be applied as Air Traffic Procedure,
- ATS workstations will provide ADS surveillance and CPDLC communications. HF and satellite telephone will be used as backup,
- Navigation will be INS and GPS, and
- ATC will provide surveillance and control service according to the aircraft position reports and data derived from ADS.

5.11 Contracts for the ADS/CPDLC workstation for four sites were issued in May 1999 and the first full passenger trial flight that utilized the ADS/CPDLC function was conducted on 24 June 2000. The route L888 will be officially opened for operation in the near future.

Agenda Item 6: Review:

a) strategy for the provision of Precision Approach and Landing Guidance Systems

b) GNSS strategy

6.1 The meeting was informed of the status of GNSS SARPs in detail by the Secretariat. The GNSS SARPs, with the exception of the GLONASS augmentation elements, have now been fully validated. Some amendments were necessary as a result of the validation process. It is presently expected that the first package of the GNSS SARPs will be reviewed by the Air Navigation Commission in October 2000 and will be adopted by the ICAO Council in March 2001. The SARPs will become applicable on 1 November 2001. At this stage SARPs provide for precision approach capability with either SBAS or GBAS. A report on the final GNSS SARPs validation meeting held in Seattle USA in May/June 2000, was presented by the Member nominated by Australia to the GNSS Panel (GNSSP).

6.2 The meeting was informed of the concept of GNSS implementation and the status of the current status of the GLONASS and GLONASS-M constellations and plans for their future development. There are 10 operational GLONASS satellites on orbit, of which seven have now exceeded their expected life. The launch program for the remaining GLONASS and new GLONASS-M satellites was also presented.

6.3 The United States presented an update on recent developments in the modernization of GPS and a status report on the US satellite navigation programme. The L2 frequency for civil use will be launched on the GPS Block IIF satellites commencing in 2003. The new L5 frequency will commence launches in 2005. Local Area Augmentation Systems, complying with the GNSS GBAS SARPs are expected to be commercially available in early 2002. The US Wide Area Augmentation System Phase 1 is expected to be operational in 2002.

6.4 Implication of discontinuation of Selective Availability (SA) was presented by the Secretariat. The effects of SA being set to zero on 1 May 2000 (UTC) were presented by Singapore, USA and Australia. In general, the horizontal errors have improved considerably from ±100 meters (95%) to approximately ±20 meters (95%). The vertical error has improved from ±150 meters (95%) to about ±30 meters (95%). The meeting considered that, in presenting GPS accuracy values, the inclusion of Horizontal, Vertical and Position Dilution of Precision (HDOP, VDOP, PDOP) values would be useful when comparing accuracy values between States.

6.5 In discussion of the performance results presented, the meeting considered it would be advantageous to conduct a measurement program of GPS performance throughout the region. To usefully compare results, the documentation submitted by Singapore was considered the most appropriate. The meeting invited Singapore to develop and coordinate a measurement programme by States within the Region. In view of the foregoing, the following draft conclusion was formulated:

Draft Conclusion 4/9 - Regional GPS measurement campaign

That:

a) Singapore develop and coordinate a GPS measurement campaign, based on the documentation practices reported, to determine normal and peak excursion of GPS performance; and
b) States in a position to do so participate in the conduct of the measurement campaign.

6.6 The meeting was informed of progress being made by the Testing of Radio Navaids Study Group (TRNSG) in the development of Volume 2 of Doc 8071 that will address ground and flight testing requirements of GNSS applications. The first and second chapters of the new Volume 2 will respectively address general GNSS issues including interference and the testing requirement for non-precision approaches. The TRNSG aims to have the complete GNSS volume prepared by the applicable date of the GNSS SARPs.

6.7 In response to COM/MET/NAV/SUR SG/3 Decision 3/17, the meeting was informed by expert from Australia of progression of the Ground Based Regional Augmentation System (GRAS). The system was described and flight test results for accuracy and integrity were presented. The results showed the test program system meets the accuracy and integrity limits for enroute, terminal and approach phases of flight as listed in the draft GNSS SARPs. Having noted the test results, the meeting considered action on Decision 3/17 completed.

6.8 To progress Conclusions 10/13 and 10/14 of the APANPIRG/10, the meeting, with the assistance of an *ad hoc* working group, chaired by expert from Singapore reviewed the strategies adopted in other regions and developed Strategies for the Provision of Precision Approach and Landing Guidance Systems and GNSS implementation in the Asia and Pacific regions. The meeting formulated the following draft conclusions:

Draft Conclusion 4/10 - Strategy for the Provision of Precision Approach and Landing Guidance System

That, the Strategy for the Provision for the Precision Approach and Landing Guidance System provided in Appendix J be adopted.

Draft Conclusion 4/11 - Strategy for the Implementation of GNSS Navigation Capability in the Asia/PAC Region

That, the Strategy for the Provision GNSS in the Asia/PAC Region provided in Appendix K be adopted.

6.9 The ad-hoc working group also considered the development of a “checklist” to assist States in the initial application of GPS for enroute and non-precision approach. The meeting reviewed the ad-hoc working group’s initial draft and supported the concept for further development.

6.10 The meeting recognized that in order to assist States in the development and early implementation of GNSS procedure for en-route and non-precision approach it is required to conduct a GNSS Implementation Workshop. In discussion, the meeting suggested that the checklist would serve as the basis of a workshop to assist States in initial implementation. Australia, Singapore and the United States indicated that such a workshop would be supported by the provision of experts. Other States present also expressed interest in participating in the workshop.

6.11 In view of the foregoing the meeting made the following draft conclusion

Draft Conclusion 4/12 - GNSS Implementation workshop

That, ICAO, with the support of experts, conduct a workshop to assist States in the development and implementation of GPS procedures for enroute and non-precision approach navigation. The workshop should draw on ICAO SARPs, PANS-OPS and other publications together with the practical experience of States gained through implementation of GPS applications.

6.12 The meeting noted the proposed development of the European Galileo as an additional GNSS provider. To better understand the programme and its effect on service provision in the Asia/Pac Region the meeting considered it desirable to invite an expert from the programme to the next Sub-Group meeting to brief the Sub-Group. The Secretariat was requested to issue a letter of invitation to an expert of the Galileo programme.

6.13 The meeting was informed of the outcomes of a GNSS Workshop held in Singapore 23-24 March 2000 by APEC's SN&C Advisory Committee. The workshop emphasized the desirability of cooperative and complementary development of GNSS applications across all user groups. The activities of ICAO in furthering the development of GNSS for aviation applications were acknowledged and supported by the workshop. The next meeting is planned for 17 to 18 August 2000 in Singapore.

6.14 The meeting was informed that the Deputy Prime Minister of Australia established an Australian GNSS Coordination Committee (AGCC) in May 2000, as an advisory group on the multimodal use of GNSS. The Terms of Reference and membership of the AGCC were presented to the meeting.

Agenda Item 7: Review:
a) implementation of the ISCS and SADIS
b) transition to the final phase of WAFS

Progress in implementation of the ISCS and SADIS by States

7.1 Under this agenda item the meeting examined the current status of implementation of the International Satellite Communication System (ISCS/2) provided by the United States of America and the Satellite Distribution System for information relating to air navigation (SADIS) provided by the United Kingdom as integral part of the ICAO aeronautical fixed service (AFS). The information concerning implementation of the ISCS/2 and SADIS as provided by States, WAFCs, available with the Secretariat and updated during the meeting was summarized as presented in Appendix L to the report.

7.2 The meeting noted the comprehensive information provided by expert from the United States regarding the completed and continuing work in the implementation of the ISCS in the ASIA/PAC, CAR/SAM and NAM/NAT and EUR Regions. The expert from the United Kingdom provided the meeting with information regarding Matra Marconi Space (MMS) digital receiver return programme to resolve the problems being experienced with the reliability of the SADIS digital receivers.

7.3 As to reception of the SADIS broadcast and processing the information, it was noted that, based on a survey on the SADIS operational efficacy in the ASIA/PAC Regions for the period 1999-2000 undertaken by the Secretariat, no major difficulties had been reported by States with the exception of Australia where the SADIS VSAT is not operational.

7.4 It was recalled that the COM/MET/NAV/SUR/3 noted that a number of States in the PAC Region do not intend to install VSATs. In this context, the meeting agreed with the views expressed by the WAFSSG (1999) that it had always been a fundamental precept of the WAFS final phase that the WAFS data would be provided by global satellite broadcasts, and it was up to each State to decide whether it wished to avail itself of this facility to obtain the WAFS data required.

7.5 With reference to the concern expressed by the SG/3 regarding difficulties to be experienced by the PAC States in obtaining the required MET products, it was noted that 19 Pacific countries have installed the Emergency Manager Weather Information Network (EMWIN) receiving equipment, as developed by the United States, and additional installation is planned in the near future. The status of EMWIN installations, as provided by the expert from New Zealand and summarized by the WMO Implementation Co-ordination Meeting on the GTS in Region V (1999), is presented in Appendix M to the report. The products being broadcast to the PAC Region include warnings, country and area forecasts, various satellite images and graphical products, aviation data and others. Some States receive WAFS products via the Internet.

SADIS strategic assessment tables

7.6 As requested by APANPIRG, in its Decision 9/21, the meeting, developed the SADIS strategic assessment tables with entries regarding the current and projected OPMET data volumes, T4 facsimile charts, BUFR data volumes, two-way VSATs and AIS data volumes for the period of 2000-2004. The meeting confirmed the views expressed by the SG/3 that, in the absence of an operational requirement specifying the type of AIS information which might be disseminated via SADIS broadcast, the projected AIS data volumes should not be included in the table. In this context, the meeting formulated the following draft conclusion.

Draft Conclusion 4/13 - SADIS strategic assessment tables

That, the ASIA/PAC SADIS strategic assessment tables, as given in Appendix N to the report, be adopted and forwarded to the SADISOPSG for planning the future SADIS bandwidth requirements.

Allocation of the SADIS two-way VSAT

7.7 The meeting reviewed the executive summary of the report of the SADISOPSG/5 (June, 2000). It was noted that the SADISOPSG had considered implementation of the SADIS enhanced two-way VSAT test programme. It had originally been envisaged that five enhanced two-way VSATs would be needed for the trial. However, the offer to take part in the trial had been declined by Singapore, Thailand (Bangkok) and the Russian Federation (Moscow), and, so far, it had not been possible to identify through the PIRGs concerned a State willing to support the installation and commissioning of the fifth enhanced two-way VSAT as part of the trials.

7.8 In light of the above, the SADISOPSG agreed to start interim trials immediately and complete the final trial with four enhanced VSATs. This left the fifth enhanced two-way VSAT still to be deployed. The SADISOPSG agreed that this situation should be brought to the attention of the PIRGs concerned. In this regard the SADISOPSG developed its Conclusion 5/14 inviting the PIRGs to consider if they could advise a site for the installation of the fifth enhanced SADIS two-way VSAT for use operationally following the trial.

7.9 The meeting considered the Conclusion formulated by the SADISOPSG/5. During the discussions, the observer from IATA reiterated views expressed by the ASIA/PAC IATA Regional Office earlier that there is no requirement for deployment of the SADIS two-way VSAT in the region.

7.10 Having discussed the proposal made by the SADISOPSG/5, the meeting found that no offer was made for the installation of the enhanced SADIS two-way VSAT.

Access to the global WAFS products

7.11 The meeting expressed its views that with increased long-range flight operations, often managed by centralized operation control, there is a need for the global WAFS products be made available at many locations of the ASIA/PAC Regions. In particular, it was pointed out that, with some exception, most of the locations within the area of responsibility of one WAFC do not have access to the products of another WAFC. In this context, some experts were of the opinion that global WAFS products be distributed through both ISCS and SADIS. The meeting supported the proposal but noted that it could be difficult to achieve from a technical point of view. Nevertheless the WAFCs confirmed that each of the RAFC SIGWX products currently being broadcast on SADIS and/or ISCS/2 would be replaced by the appropriated WAFS SIGWX product(s).

7.12 In light of the above, the meeting considered an alternative means for reception of the global WAFS products. It was noted, in particular, that products produced by the WAFC Washington are distributed through ISCS with all the graphical products being made available on the Aviation Weather Centre's (AWC) Internet site and on the International Flight Folder site. The WAFS products from the WAFC London are not available via the Internet. From this point of view, the meeting felt that availability of global WAFS products via the Internet could solve the problem.

7.13 Some clarification on the subject was provided by the Secretariat. In particular, attention of the meeting was drawn to the APANPIRG Conclusion 10/21 calling for ICAO to consider developing the policy for use of the Internet by States to obtained the WAFS products and OPMET data for operational purposes. It was pointed out that the Air Navigation Commission noted the Conclusion and requested the Secretary General to consider developing a uniform policy in this regards. The meeting agreed that an important objective for the WAFS is to make all WAFS products available on both SADIS and ISCS.

7.14 The meeting noted the above clarification provided by the Secretariat, however, agreed that the WAFCs be invited to consider the possibility of providing their products via the Internet to support the long-range flight operations with centralized operation control and to ensure arrangements for obtaining WAFS products in the event of the ISCS or SADIS failure. The meeting also took note of the clarification provided by the Secretariat regarding the authorized access to the ISCS and SADIS satellite broadcasts and agreed that measures may be taken to introduce a restriction to prevent access by unauthorized users. In this context, the meeting formulated the following draft conclusion.

Draft Conclusion 4/14 - Authorized access to the global WAFS graphical products via the Internet

That, ISCS and SADIS provider States consider the possibility of providing global availability of WAFS products via the Internet, to approved ISCS and SADIS users.

Status report on implementation of transition to the final phase of WAFS

7.15 The meeting was provided with information on a survey undertaken by the ASIA/PAC WAFS Transition Task Force to assess the level of preparedness of States in the region for the transfer of responsibility for SIGWX from RAFCs to the WAFCs London and Washington.

7.16 It was noted that, all responding States are of the opinion that the SIGWX charts produced by the WAFCs are of acceptable quality. There was general agreement that the WAFCs should continue their efforts to further improve the quality of the charts. The meeting was pleased to note that all responding States are ready for the transfer of responsibility from RAFCs to WAFCs.

7.17 A number of significant issues relating to the implementation of the final phase of WAFS were considered by the meeting, such as collaboration between WAFCs and States, and the provision of SIGWX advisories. The meeting recommended that States be requested to adhere to the provisions of Annex 3.

7.18 Information was provided to the meeting by experts from New Zealand, Singapore and Hong Kong, China regarding evaluation of the SIGWX charts produced by the WAFCs, including feedback from airline operators. In particular, it was noted that, as reported by the expert from Hong Kong, China, feedback had been received from operators, that the WAFS SWH chart for Area I (Northern Pacific) in polar stereographic projection covered too big an area and as a result the chart information in the poleward direction became overly cluttered. One possible solution suggested was to add a new SWH area with the same coverage, scale and map projection as the existing SWH chart from RAFC Tokyo (PBNE10RJTD). The meeting formulated the following draft conclusion.

Draft Conclusion 4/15 - Issuance of SWH chart by WAFC Washington

That, the United States be invited to consider issuing a SWH chart by WAFC Washington with the same coverage, scale and map projection as the current chart produced by RAFC Tokyo.

7.19 The meeting reviewed the outcomes of the WAFSSG/7 meeting (28 September - 1 October 1999).

7.20 The information regarding the current state of planning and implementation of backup procedures by the WAFC Washington and WAFC London was provided to the meeting by expert from the United States.

7.21 The expert from Japan advised the meeting that the Japan Meteorological Agency plans to terminate the HF radio broadcast for aviation (JMJ) on 28 February 2001.

Requirements for SWM charts

7.22 The survey undertaken by the Task Force identified a need for additional SWM within the region. The meeting concluded that IATA be requested to consider the requirement for a SWM covering the area as shown in Appendix O to this report.

Draft Conclusion 4/16 - Requirements for WAFS SWM charts

That, IATA be requested to urgently confirm the requirement(s) for SWM chart(s) in the ASIA/PAC Regions.

WAFS Transition Plan and Procedures

7.23 The meeting reviewed the ASIA/PAC Transition Plan and Procedures, as drafted by the WAFS Transition Task Force in coordination with RAFCs and WAFCs concerned. Having provided some comments, particularly regarding a timetable for achieving the final phase of WAFS in the region, and editorial changes, the meeting adopted the Plan and formulated the following draft conclusion.

Draft Conclusion 4/17 - Amended ASIA/PAC WAFS Transition Plan and Procedures

That, the ASIA/PAC WAFS Transition Plan and Procedures for the transfer of responsibilities from RAFCs to the WAFCs London and Washington be amended as shown in Appendix P to this report.

7.24 Having amended the WAFS Transition Plan and Procedures, the meeting agreed that the new task relating to implementation of the transition to the final phase of WAFS should be included in the Subject/Tasks List in the COM/MET/NAV/SUR fields.

Transfer of responsibility for production of SIGWX charts from RAFCs to WAFCs and closure of RAFCs

7.25 Having reviewed an evaluation of the SIGWX charts produced by the WAFCs London and Washington and the ASIA/PAC status report on implementation by the RAFCs and States of transition to the final phase of WAFS, the meeting agreed that the ASIA/PAC Transition Plan and Procedures are being successfully implemented. In this context, the meeting formulated the following draft conclusions:

Draft Conclusion 4/18 - Transfer of production of SIGWX charts to WAFCs and closure of RAFCs New Delhi, Melbourne and Wellington

That,

a) responsibilities for production of SWM and SWH charts (area D and Asia South) from RAFC New Delhi be transferred to WAFC London;

b) responsibilities for production of SWH charts (areas E and F) from RAFC Melbourne be transferred to WAFCs London and Washington;

c) responsibilities for production of SWH charts (areas J and F) from RAFC Wellington be transferred to WAFC Washington;

d) WAFCs London and Washington assume their responsibilities effective 1 September 2000; and

e) Following successful implementation of the transfer, RAFCs New Delhi, Melbourne and Wellington be closed on 1 March 2001.

Draft Conclusion 4/19 - Transfer of production of SIGWX charts to WAFCs and closure of RAFC Tokyo

That,

a) responsibility for production of SWH charts (areas I, E and G) from RAFC Tokyo be transferred to WAFCs London and Washington effective 1 March 2001; and

b) RAFC Tokyo be closed on 1 March 2001.

Review of WAFS Tables MET 5 and MET 6 of the ASIA/ANP (FASID)

7.26 As a follow up of the above discussions regarding transfer of production of SIGWX charts to WAFCs and closure of RAFCs, the meeting reviewed and amended the WAFS Tables MET 5 and 6 of the ASIA/PAC ANP (FASID) to reflect progress made to transition to the final phase of WAFS. Some changes of editorial nature and those as suggested by the WAFSSG/7 were also made. The meeting formulated the following draft conclusion.

Draft Conclusion 4/20 - WAFS Tables MET 5 and 6 of the ASIA/PAC ANP (FASID)

That, Tables MET 5 and 6 of the ASIA/PAC ANP (FASID) be amended as shown in Appendices Q and R to the report.

Future Work Programme for the WAFS Transition Task Force

7.27 The meeting expressed its appreciation to the WAFS Transition Task Force for the work done and strongly endorsed the requirements for the Task Force to continue its work until the final phase of the WAFS is implemented in the ASIA/PAC Regions. Having developed the future work programme for the Task Force, the meeting formulated the following decision.

Decision 4/21 - ASIA/PAC WAFS Transition Task Force

That,

a) The ASIA/PAC WAFS Transition Task Force continue its work until the final phase of WAFS is implemented; and

b) The Work Programme for the Task Force be agreed as given in Appendix S to this report

Agenda Item 8: Exchange of OPMET information

Implementation of the ROBEX Scheme

8.1 Under this agenda item, the meeting first took note of implementation of the ROBEX Scheme. The meeting was advised that after the 11th edition of the ROBEX Handbook is published in August 1998, a number of amendments to the ROBEX Scheme arising from changes in operational requirements for OPMET data exchanges had been co-ordinated with the States concerned and implemented. All the changes made were incorporated into draft Amendment No. 1 to the ROBEX Handbook, which was reviewed and agreed by the meeting.

8.2 The meeting was advised by member from New Zealand that all aviation weather information provided to meet ICAO obligations is prepared by Meteorological Service of New Zealand Ltd. at an office located in Wellington. It was therefore proposed that all references to the Auckland MCC and Auckland TCC in the ROBEX Handbook be changed to Wellington MCC and Wellington TCC. It was noted that this change would not effect any of the AFTN addresses currently used for the exchange of METAR and TAF bulletins to or from New Zealand. The meeting agreed that the changes should be included in the draft Amendment No. 1 to the ROBEX Handbook. Tables MET 4A and 4B of the ASIA/PAC ANP (FASID) will be amended accordingly following official notification from New Zealand regarding the changes.

8.3 The meeting noted the information provided by expert from Republic of Korea regarding Inchon International Airport. It was advised that MWO in Seoul/Kimpo would be relocated to new Inchon Aviation Weather Centre (AWC). New AFTN address to be used for sending advisories from the relevant VAAC and TCAC was also provided. The meeting noted that the Seoul MCC/TCC will be relocated to Inchon MCC/TCC, and Tokyo VOLMET broadcast should include Inchon METAR instead of Kimpo METAR.

8.4 In light of the above, it was noted that, following official notification from Republic of Korea, amendments would be made to the relevant MET tables of the ASIA/PAC ANP (FASID) and the ROBEX Handbook. It was also noted that COM facilities would be affected accordingly.

8.5 The meeting was also advised that with Amendment 72 to Annex 3/WMO Technical Regulations (C.3.1) the inclusion of the code name METAR/SPECI and TAF becomes compulsory with every report. In this context, the procedures of the ROBEX Scheme concerning both METAR and TAF bulletins will be amended by the end of 2001 to align the scheme with ICAO Annex 3/WMO Technical Regulations. It was noted that the proposed amendment to Annex 3 are envisages for applicability on 1 November 2001.

OPMET data exchange for support of the ISCS and SADIS broadcasts

8.6 It was recalled that the operational procedures to facilitate distribution of the ASIA/PAC OPMET information to the WAFCs London and Washington for SADIS and ISCS broadcasts had been adopted by APANPIRG as suggested by the COM/MET/NAV/SUR SG (APANPIRG Conclusions 9/29 and 10/22 ref.).

8.7 The meeting noted that the procedures to facilitate distribution of OPMET data to the WAFCs have been fully implemented by the Bangkok, Singapore and Tokyo ROBEX OPMET Data Banks. As a matter of urgency, actions required to be taken for implementation of the procedures by Brisbane and Nadi ROBEX OPMET Data Banks to facilitate distribution of data to WAFC Washington for uplink to the ISCS broadcasts.

8.8 The meeting also agreed that actions should be taken by the ROBEX MCCs/TCCs for implementation of the revised ROBEX Scheme to extend the collection areas and compile additional bulletins as recommended by APANPIRG in its Conclusion 10/23, calling for inclusion in the ROBEX Scheme of all international aerodromes listed in Table MET 1 of the ASIA/PAC ANP (FASID). In this context, it was noted that the new ROBEX procedures had been implemented recently by Beijing ROBEX Centre, which collects and disseminates METARs/TAFs from 28 international aerodromes.

8.9 In light of the above, it was emphasized that timely onward dissemination of data from the ROBEX Centres to the ROBEX data banks, and then to WAFCs London and Washington for uplink to the satellite broadcasts is of paramount importance to facilitate the global exchange of OPMET information.

Implementation of OPMET data exchange

8.10 The information regarding actions taken for improvement of OPMET data exchange between China and Mongolia was provided to the meeting by expert from Mongolia. It was reported that the established ROBEX procedures had been fully implemented. The meeting agreed that the list of air navigation shortcomings and deficiencies in the MET fields should be amended to delete the relevant shortcoming. This list has been amended accordingly.

8.11 As to proposal by Mongolia to implement the international exchange of 9 hour TAF to support the short-haul flight operations, it was clarified that in the ASIA/PAC Regions there is no requirement for 9 hour TAF. Therefore, the required exchange of data should be implemented based on bilateral arrangements between the States concerned.

8.12 The meeting was advised by expert from China regarding implementation of the Civil Aviation Meteorological Data Bank System (CAMDS) and Civil Aviation Meteorological Satellite Broadcast System (CAMSBS). The information on preparation and distribution of SIGWX charts and W/T charts for domestic flights was noted by the meeting.

8.13 Expert from Australia advised the meeting regarding a system for verifying terminal aerodrome forecasts developed by Australia.

Data-link applications related to OPMET information

8.14 The meeting was provided with information on the status of the development of OPMET data-link applications as progressed by the Secretariat with assistance of the Meteorological Information Data Link Study Group (METLINKSG). Particular attention of the meeting was drawn to the proposals to amend Annex 3 introducing provision for D-VOLMET in the form of templates and the issuance of graphical SIGMETs. Some important issues considered by the METLINKSG/5 (February 2000) were also noted by the meeting.

Agenda Item 9: Implementation of international airway volcano watch

Status of implementation of international airways volcano watch

9.1 The meeting reviewed the status of implementation of the international airways volcano watch (IAVW) in the ASIA/PAC Regions. It was noted that the volcanic ash advisory centres (VAACs), namely Anchorage, Darwin, Tokyo, Washington and Wellington, designated to provide the advisory service in the ASIA/PAC Regions have been fully implemented. It was also noted that various formal and informal arrangements between the VAACs and volcanological and civil aviation authorities are working satisfactorily in most cases. A number of operating plans have been implemented.

9.2 The meeting noted the outcome of the VAWSG/3 (May, 2000) and progress in the implementation of the IAVW, and considered whether further actions were needed to foster implementation of the IAVW in the ASIA/PAC Regions. In this regard the meeting indicated a preference for the volcano symbol to be included on SIGWX charts only when a SIGMET has been issued. Changes to the content and layout of the volcanic ash advisory messages developed by the VAWSG/3, as requested by IATA to facilitate its automated processing, were noted by the meeting. However, concern was expressed about the sample message provided to the meeting as developed by the VAWSG/3. It particular it was felt that the sample did not lend itself to ease of reading and interpretation by MWOs.

9.3 The information on a recent meeting held with Argentina to consider ways of assisting the Buenos Aires VAAC on a number of matters including training, volcanic ash modeling and volcanic ash procedures were provided to the meeting by expert from the United States.

9.4 The Chairman of the Volcanic Ash Working Group provided information about a survey on the need to retain the ASIA/PAC Volcanic Ash and Aircraft Operations Regional Handbook, which had been prepared and issued by ICAO in 1993. The respondents, who included the VAACs in the ASIA/PAC Regions, and a number of pilots and airlines, indicated that there was no longer a need for the Handbook. It was noted that the Handbook contained some background information on volcanoes, which was still referred to occasionally. However, the other information in the Handbook was considered to be out of date and had been superceded by information contained in other ICAO documents including Annex 3, the IAVW Operational Procedures and in the ICAO Manual on Volcanic Ash, Radioactive Debris and Toxic Chemical "Clouds". It was noted that ICAO expects to issue a new edition of the manual on volcanic ash and other material released into the atmosphere that are considered to be hazardous to aircraft operations. It is also planned that the IAVW Operational Procedures are to be published in "handbook" format, and would be placed on the ICAO IAVW web site.

Extension of VAAC areas of responsibility

9.5 The meeting noted the following developments, which had eliminated the main outstanding areas for which coverage had been required:

a) The United States, through WMO, agreed to extend the area of responsibility of the Anchorage VAAC westwards to 150ºE (north of 60ºN) in order to cover the easternmost new polar air routes across Siberia;

b) Australia agreed to extend the area of responsibility of the Darwin VAAC westwards to 75ºE to cover Area B in the IAVW, and informed WMO accordingly. It was noted that, this would provide formal monitoring of eruptive events at Barren Is. in the Andamans; and

c) China and Japan reached agreement for the Tokyo VAAC to extend the western boundary of its area of responsibility to 90ºE to provide improved coverage of the volcanoes in China.

9.6 It was agreed that the relevant amendments to Table MET 3, Part II of the ASIA/PAC ANP (FASID) should be made in due course to reflect changes in the VAACs areas of responsibility. The list of MWOs to which advisory information is to be sent by the VAACs should be amended accordingly.

Deficiencies in implementation of IAVW

9.7 Australia and Japan provided details of the actions that had been taken by the Darwin and Tokyo VAACs during recent eruptions of the Mayon volcano in the Philippines. The two VAACs had experienced considerable difficulties in obtaining adequate information about the eruptions. It was also noted that some airlines had expressed their dissatisfaction with the flow of information to them during the eruptions, and they had considered this to be inadequate for safe operations. In particular it was noted that no SIGMETs had been received from Manila, and advisories issued by the Tokyo VAAC had not been sent directly to the airlines. Australia also advised that they had noted inconsistencies between the output from the dispersion models and the actual wind regime in the area of the Mayon volcano. The meeting was advised of the actions that the Darwin VAAC has subsequently taken to improve the effectiveness of volcanic ash warning procedures. Japan provided information about volcanic ash graphics that the Tokyo VAAC had prepared and issued during eruptions of the Mayon volcano, and a display of these was presented to the meeting.

9.8 The meeting noted with some concern apparent inadequacies in the issue of SIGMETs in the ASIA/PAC Regions, particularly with regard to volcanic ash. It was felt that the inadequacies were probably due to a number of factors including problems with communications, the training and skills of staff at some MWOs and some unfamiliarity with procedures for issuing SIGMETs. It was concluded that urgent consideration should be given to the establishment of a Special Implementation Project to address the inadequacies. In this context, the meeting formulated the following draft conclusion.

Draft Conclusion 4/22 - SIGMET Special Implementation Project

That, ICAO urgently consider a proposal for the ASIA/PAC Special Implementation Project be established with the primary objective to improve implementation of SIGMET procedures.

9.9 Having formulated the above draft conclusion, the meeting agreed that the inadequate implementation of the SIGMET procedures should be included in the list of air navigation shortcomings and deficiencies in the MET field in the ASIA/PAC Regions. The list has been amended accordingly.

Volcanic Ash Working Group

9.10 The meeting expressed its appreciation to the Volcanic Ash Working Group (WG) for its valuable contribution by continuing to assist the Sub-group in monitoring implementation of the IAVW and developing recommendations for improvement of the IAVW operational procedures. The meeting strongly endorsed the requirement for the WG, to continue its work. It was requested that the WG should assist with the development of the proposed ASIA/PAC SIGMET Special Implementation Project and its implementation.

9.11 The meeting was advised that member from New Zealand would not be in a position to continue to chair the WG. It was agreed that the work should progress by correspondence until the new chairman is designated.

Agenda Item 10: Update the CNS and MET parts of ASIA/PAC FASID

10.1 The meeting noted that the draft Basic ASIA/PAC Air Navigation Plan (ANP) and the ASIA/PAC Facilities and Services Implementation Document (FASID) were prepared and informally circulated to States in accordance with Conclusion 9/34 of APANPIRG for review and comments. The documents were subsequently updated incorporating comments from States. In accordance with Conclusion 10/27 of APANPIRG and the Council action thereon, a proposal for amendment of the ASIA/PAC Air Navigation Plan was circulated to States and International Organizations under reference APAC 00/3- AOP/ATS/COM/MET/SAR/AIS. States are expected to send their comments by 25 August 2000.

10.2 The amendment proposal is expected to be finalized soon after 25th August 2000 for approval by the President on behalf of the ICAO Council. After approval two separate documents (Basic ANP and FASID) will be published and kept current in accordance with the established procedure.

10.3 It was also noted that the CNS and MET Tables contained in the FASID were updated based on the information provided by States. The new format for ATN Tables developed by the Second Meeting of the ATN Transition Task Force and resulting comments thereon were also incorporated in the FASID.

10.4 The experts were requested to assist in expediting reply to the amendment proposal from their respective Administrations so that it reaches the ICAO Regional Office prior to 25th August 2000.

Agenda Item 11: Future Work Programme

11.1 Assuming that the ATS/AIS/SAR SG/11 is likely to be scheduled for June 2001, it was proposed that the fifth meeting of the COM/MET/NAV/SUR Sub-Group be held in Bangkok from 16 to 20 July 2001.

11.2 The third meeting of the ATN Transition Task Force will be held in March 2001 in Singapore.

Agenda Item 12: Any other business

Results of the ITU World Radiocommunication Conference -2000 (WRC-2000)

12.1 The meeting noted an overview of the results of WRC-2000 on main items of interest to civil aviation, which were as follows:

a) With regard to the future use of the GNSS frequency band 1 559 -1 567 MHz, the conference agreed that no allocation should be made to the mobile satellite service in this band. Furthermore, Resolution 220. The conference also agreed to downgrade the fixed service, which operates in the GNSS band in a number of countries, to a secondary status after 1 January 2005 (except in some countries, which could only agree to this downgrading with effect from 1 January 2010). After 1 January 2015, the footnotes will be suppressed;

b) the conference agreed to amend the provisions of the Radio Regulations to improve civil aviation access to the satellite frequency bands that WRC-97 had allocated on a generic basis to the mobile satellite service. In a Resolution, States agreed to ensure that mobile satellite service operators carrying non-safety related traffic yield capacity (spectrum) as and when necessary, to accommodate the spectrum requirements of the aeronautical mobile satellite (R) service;

c) proposals to introduce a new allocation to the (terrestrial) mobile service in the band 2700 -2900 MHz were not accepted; and

d) new allocations were made to the radionavigation satellite service in various bands. These provisions enable the introduction of GPS L5 and of the Galileo system. Since the allocations were made in bands used by the aeronautical radionavigation service (DME, radar and MLS), regulatory provisions were incorporated in the Radio Regulations to ensure protection of these services.

12.2 The next World Radiocommunication Conference is currently scheduled for 2003. The ITU Plenipotentiary Conference will be held in 2002.The draft agenda for the WRC-2003 was also noted.

12.3 In general, the conference results satisfied the ICAO position. A significant element in the ICAO preparatory activities for this conference was the early awareness and involvement of Contracting States in the development of the ICAO position. Major factors contributing to this achievement were:

a) the implementation of: Assembly Resolution A32-13; 35th ASIA/PAC DGCA Conference Action Item 35/9 and APANPIRG/10 Conclusion 10/15. Active participation by civil aviation representatives during development of States position and at APT meetings and the WRC-2000 greatly contributed to the successful outcome of the meeting;

b) higher profile of spectrum management issues in ICAO through the actions of the governing bodies and personal actions by the President of the Council and the Secretary General (letters to Ministers and CAA'S) and participation in WRC- 2000 work; and

c) the increased participation by ICAO experts in the meetings of the regional telecommunication organizations (APT, CEPT, CITEL, African group). The involvement of the ICAO Asia and Pacific Office at several regional preparatory meetings proved important in supporting the development of regional proposals to the conference that were satisfactory for civil aviation.

12.4 A full analysis of the impact of the WRC-2000 decisions and an expeditious start of the ICAO preparatory activities for the next conference are initiated. Meeting of the Working Group F of the Aeronautical Mobile Communications Panel will be held in Berlin from 21-25 August 2000. The meeting noted agenda of the meeting.

12.5 Australia provided in detail results of WRC-2000 on various agenda items of interest to the meeting. It was noted that the Australian/APT proposal to amend Resolution 207 and Article S15 to bring this issue to the attention of all Administrations, to initiate studies into HF interference mitigation and to improve responses to interference reports was fully supported throughout by a number of administrations including the CITEL group particularly the USA and Canada. The issue was further reinforced with an input paper from the USA showing widespread HF interference form illegal sources throughout the World. Resolution 207 and Article S15 have also been further strengthened to deal with this type of HF interference with the incorporation of elements from a draft new Resolution proposed by CITEL on similar HF issues.

12.6 In regard to the specific issue of interference from calling on HF safety and distress frequencies as experienced by the maritime mobile service, the following solutions were adopted:

- a new Resolution calling for ITU-R studies to establish the causes of interference and report the results to WRC 2003, and;

- an amendment to Appendix S17 stipulating that use of the distress and safety channels currently used for calling should not be so used from 31 Dec 2003.

Key Aviation Issues for next WRC

12.7 Australia provided background information on agenda items on the key aviation issues issues affecting aviation at the next WRC as follows:

- Agenda Item 1.4: to consider the results of studies related to Res 114 (WRC-95) dealing with the use of the band 5091-5150 MHz

- Agenda Item 1.14: to consider measures to address harmful interference to the maritime mobile and aeronautical mobile (R) services in the HF bands

- Agenda Item 1.15: to review the results of studies concerning the radionavigation satellite service

- Agenda Item 1.28: to permit the use of the band 108-117.975 MHz for the transmission of RNSS signals

12.8 It was suggested that the issues identified above needs to be considered and addressed while dealing with spectrum issues and preparation for WRC-2003.

12.9 IATA informed the meeting that the meeting that at WRCs greatest support came from States in the ASIA/PAC region. He emphasised that at WRCs it is very important that aviation representative from States must attend in order to defend the aviation spectrum requirements as International Organisations attend such meetings as observers and do not have the right to make or defend proposals until called for by States to so. IATA further added that ICAO and IATA worked together very close to secure aviation interest. This spirit to teamwork and co-operation should be maintained in dealing with the challenges in the future.

12.10 The meeting expressed appreciation to the concerted efforts made by States in the Region and the ICAO Asia/Pacific Regional Office at all the APT Conference Preparatory Group meetings to secure support for ICAO Position for WRC-2000 and for carrying timely follow-up on matters requiring urgent actions. The Secretariat thanked all the States for providing support at the national and regional levels and at WRC-2000.

12.11 The spectrum issue enables us to achieve future modes in CNS/ATM environment. The Sub-Group should have a standard agenda on spectrum. It is important to secure strong support from States at the regional forums, which should be attended by a larger number of aviation representatives. In order to achieve success at future WRCs, aviation representatives should actively participate in the development of position at the national level, participate at regional level Conference Preparatory Group meetings conducted by APT and attend WRCs. In view of the foregoing, the meeting formulated the draft conclusion as follows:

Draft Conclusion 4/23 - Protection of aeronautical frequency spectrum

That States,

a) assign high priority to the aeronautical spectrum management;

b) participate in the development of States' position for WRCs at the national level to ensure support to ICAO position;

c) ensure to the extent possible aviation representatives are included in States delegation to the APT Conference Preparatory Group meetings and at WRCs.

Free Flight Phase 1

12.12 The United States informed the meeting that the goal of Free Flight Phase 1 (FFP1) is to develop known technology in Air Traffic Management (ATM) capabilities to deliver early benefits to service providers and users of the National Airspace System (NAS) while maintaining or exceeding current levels of safety. These capabilities were defined by RTCA, Inc. (RTCA), formerly known as the Radio Technical Commission for Aeronautics now only utilizes the acronym, through a consensus process that drew upon the airline industry, labor organizations, the NAS Modernization Task Force, and other Federal Aviation Administration (FAA) offices.

12.13 FP1 is chartered to implement capabilities that provide early, measurable benefits to the aviation community and provide a vital start to the agency's evolution to free flight. These "core" capabilities are:

- Surface Movement Advisor (SMA)
- Collaborative Decision Making (CDM)
- Traffic Management Advisor (TMA)
- Passive Final Approach Spacing Tool (pFAST)
- User Request Evaluation Tool (URET) with Conflict Probe

12.14 It was further noted that FFP1 has already provided measurable benefits to users and operators of the NAS. The airlines have noted SMA's operational value. There is documented analysis of CDM's improvements. There have been measurable increases in direct routes with URET at Indianapolis Center and Memphis Center. There are measurable pFAST improvements at Dallas Fort Worth International airport. Finally, improved flows with TMA have resulted in increased acceptance rates.

Need for Additional SSR Code for ATS in the Asian Part of Russia

12.15 The meeting noted that the Russian Federation had obtained over 200 additional SSR codes. The requirement for SSR code allocation in the Asian Part of Russia Federation is increasing and additional 140 codes were required. In order to secure additional allocations co-ordination with the ICAO Regional Office Paris is being undertaken by the Russian Federation. Meanwhile, Russian Federation was exploring possibility of sharing some allocations from the Asia and Pacific region. The Secretariat informed that the SSR code management plan for the Asia and Pacific region had been completed and no additional assignments were available for sharing.

Inter - Regional Coordination

12.16 The meeting was informed that the first inter-regional coordination meeting (IRCM) of the ICAO Secretariat from ASIA/PAC, Middle East, European Regions and ICAO Headquarters will be held in Bangkok from 11 to 13 October 2000. The meeting will focus primarily on matters concerning the Asia-Europe traffic flow which is of significant interest and which concerns the three Regional Offices, Bangkok, Cairo and Paris.

The objective and scope of the meeting will be as follows:

a) to develop terms of reference;
b) to develop a procedural model as guidance for the future IRCM;
c) to identify and develop an inventory of specific areas requiring inter regional coordination; and
d) to develop result–oriented action items with target dates for completion.

12.17 The meeting also noted the proposed agenda of the meeting covered various fields such as Harmonization of CNS/ATM activity, ATM matters, CNS matters and other inter-regional issues for discussion

12.18 The initial meeting will be confined to the ICAO Secretariat and its expansion will be considered in due course, as necessary. It is proposed to discuss the several issues requiring inter-regional coordination and develop a procedure and mechanism for execution of the coordination activities.

Regulatory reform in Australia

12.19 The meeting was informed that the Civil Aviation Safety Authority of Australia (CASA) is undertaking a programme of regulatory reform to replace the existing regulations. The object of the programme is to modernize the existing regulations, align requirements where possible with accepted international practice and to allow changes in the method of regulating various functions. These new regulations will amend the manner in which certain services are regulated and at the same time may provide the opportunity for other methods of provision other than by direct Government supply. The meeting took note of the CASA regulatory reform programme.

Establishment of MET Working Group for development of a new Chapter for the Regional Plan for CNS/ATM Systems

12.20 The meeting noted that Chapter 8 on the Meteorology had been added to the Global Air Navigation Plan for the CNS/ATM Systems. This Chapter addresses the coordinated national, regional and global planning of meteorological systems to support air traffic management. In view of this the meeting, as proposed by an expert from Hong Kong, China, discussed the need to add a Chapter in the ASIA/PAC Regional Plan for the new CNS/ATM Systems. In order to develop the new Chapter the meeting established a Working Group consisting of experts from Australia, Hong Kong, China and United States. The expert from Hong Kong, China will to act as a Rapporteur of the Working Group. It was also agreed that the work should progress through correspondence.

12.21 In view of the foregoing the meeting formulated the following decision.

Decision 4/24 - MET Working Group on CNS/ATM Plan

That, a MET Working Group on CNS/ATM Plan consisting of experts from Australia, Hong Kong, China and United States be established with the task of completing a draft material for Meteorology Chapter of the ASIA/PAC Regional Plan for the New CNS/ATM System. The draft be presented to the fifth meeting of the Sub-Group.

PROPOSED TITLE AND TERMS OF REFERENCE OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE (CNS) AND METEOROLOGY (MET) SUB-GROUP OF APANPIRG

TERMS OF REFERENCE

1. Ensure the continuing and coherent development of the *ASIA/PAC Regional Air Navigation Plan* and the *ASIA/PAC Regional Plan for the New CNS/ATM Systems* in the CNS/MET fields.

2. Review and identify shortcomings and deficiencies that impede the implementation or provision of efficient CNS/MET services in the ASIA/PAC Region.

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

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

5. Review and identify inter-regional co-ordination issues in the fields of CNS/MET and recommend actions to address those issues.

SUBJECT/TASKS LIST IN THE COM/MET/NAV/SUR FIELDS

The priorities assigned in the list have the following connotation:
A = Tasks of a high priority on which work should be expedited;
B = Tasks of medium priority on which work should be under taken as soon as possible but not to the detriment of Priority "A tasks; and
C = Tasks of medium priority on which work should be undertaken as time and resources permit but not to the the detriment of priority "A" and "B" tasks.
TOR = Terms of Reference of the Sub-Group

No	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
1	RAN/3 C.8/6	Subject: Shortcomings in volcanic ash colour codes Task: Aviation volcanic ash color code		Study proposal by IFALPA to modify the aviation volcanic ash code.	COM/MET IFALPA	Completed
2	RAN/3 C.14/24	Subject: Relevance of the content of the table of navigation and surveillance services Task: a) To provide information for the update of the ANP taking into account required additions and deletions. b) Provide the above information in an informal document that can also be used as a planning instrument for action o other tasks.		a) Undertake a comprehensive review of the table of radionavigation aids at appropriate intervals in consultation with States and international organisations b) Develop a document to indicate the current ANP requirements, the implementation status of those requirements and future planning requirements Task completed: Review completed On-going review mechanism established	NAV/SUR	Completed
3	RAN/3 R.9/3b)	Subject: Procedures for exchange of METARS between regions Task: Exchange of METARS to support operations between ASIA/PAC and other regions.		Establish procedures for exchange of METARS between ASIA/PAC and other regions with a view of developing appropriate proposals to amend the ANP.	COM/MET	Completed
4	RAN/3 R.9/4	Subject: Designation of International OPMET data banks Task: Designation of international OPMET data bank to serve the Asia and Pacific Regions.		Recommend an international OPMET data bank or banks to be designated to serve the ASIA/PAC region.	COM/MET	Completed

No	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
5	RAN/3 C.10/12	Subject: Standard Protocols Task: Harmonization of ground-ground data links.		Consider harmonization of ground-ground data link protocols and procedures that will be inter-operable with the ATN.	COM/MET AFTN Mgmt. TF	Completed
6	RAN/3 R.10/18	Subject: WAFS satellite coverage in Asia Region Task: Areas to be covered by World Area Forecast System (WAFS) satellite broadcast.		Co-ordination with WAFS satellite broadcast provider States to ensure access for States in western part of Asia/Pac Region completed.	ICAO WAFS provider State	Completed
7	RAN/3 C.10/20	Subject: Alpha numeric data on WAFS satellite broadcast Task: Inclusion of alphanumeric data on ASIA/PAC World Area Forecast System (WAFS) satellite broadcast.		Consider inclusion of alphanumeric format OPMET and AIS messages on WAFS satellite broadcast.	COM/MET WAFS provider States	Completed
8	RAN/3 C.11/9	Expansion of Communication Tables Legends.		Develop terminology and legends to represent elements used in ATN.	COM/MET	Completed
9	APANPIRG C.2/27	Subject: Frequency congestion on SEA-1 network Task: Aeromobile Communications Improvements - resolution of deficiencies		Identify aeromobile communications deficiencies in the region and develop appropriate solutions	ICAO States	Completed
10	APANPIRG C. 3/15	Subject: Regional radar data exchange Task: Standardize radar data formats		1) Gather information on formats used in the Region 2) Encourage the use of standardized and automated exchange of radar cross FIR boundaries 3) Consult with Eurocontrol on the use of ASTRIX 4) Consider ATN/ADS compatability issues	NAV/SUR ICAO US	Completed
11	RAN 3 C. 12/1	Minimum value of field strength for NDB's		Action on this subject completed.	NAV/SUR C.2/2	Completed
12	RAN/3 C. 12/6	Subject: Provision of cost effective and operationally acceptable approach and landing guidance Task: 1) ILS/MLS transition planning		Develop an ILS/MLS transition plan taking into account; 1) cost benefit studies conducted by states in the Region 2) studies and trials on MLS development and other relevant systems 3) progress achieved on technical and operation issues on MLS 4) progress in ILS/MLS transition planning in other regions 5) current plans of individual States in the Region on ILS/MLS an	NAV/SUR	Completed

No	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
		2) Action on the outcome of the Spec. om/Ops		6) outcome of the COM/OPS Div 95 Meeting. Task completed: ILS/MLS transition issues resolved by outcome of Spec. Com/Ops Div95 Meeting. Regional strategy review completed.		

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
13	APANPIRG D.7/28	Subject: Non-implementation of carriage of ACAS in ASIA/PAC region Task: To examine the application of ACAS in the ASIA/PAC region and to develop a time-table for implementation		Review the benefits to be gained through carriage of ACAS in the region and develop a programme of implementation of carriage of ACAS	COM/MET/NAV/SUR	Completed
14	RAN/3 C.14/4 RAN/3 C.5/2 (TOR 1)	Development of detailed description for the contents of the ASIA/PAC Facilities and Services Implementation Document (FASID) Ensure harmonised Regional Com/Met/Nav/Sur plan development		Develop detailed format and content for the COM/MET/NAV/SUR part of the Facilities and Services Implementation Document (FASID) as a matter of priority. Take into account global CNS/ATM plans as adopted by APANPIRG.	COM/MET/NAV/SUR AFS MGT TF NAV/SUR TF	Completed
15	RAN/3 C.8/17 (TOR 3)	Subject: Lack of WAFS data for long-haul operations Task: WAFS support to long-haul operations		1) Study the development of interim arrangements to provide WAFS support to long haul operations. 2) India to rebroadcast WAFS charts received from Tokyo RAFC. 3) WAFC Washington provide wind/temp charts for 36 hours range.	COM/MET USA	Completed Completed Completed
16	APANPIRG D. 9/31	Problem : Revision of GNSS RAS Task : Development of an alternative strategy for the provision of GNSS RAS	A	Review the existing strategy and an alternative strategy be developed with a view to focus on ensuring appropriate service provision from the space-based system and alternative technology available	COM/MET/NAV/ SUR SG	Completed
17	RAN/3 C.14/19 (TOR 3)	Subject: Lack of AIDC procedures Task: Development of on-line data interchange procedures and table for use in the Region	B	1) Develop on-line data-interchange procedures to support CNS/ATM applications. (AFTN AIDC) 2) Develop a logical connectivity table for the exchange of flight data information using the ATN. (ATN AIDC Table)	ICD Task Force COM/MET/NAV/SUR (ATN Trans. T/F)	Completed Completed

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
18	APANPIRG D. 4/46 RAN/3 C.12/3 APANPIRG 5/33 (TOR 3)	Subject: Provision of adequate COM/NAV/SUR services Task: Monitor the development and implement new com/nav/sur services eg ATN,GNSS, ADS with minimal transitional impact	A	1) Encourage States to conduct R&D, Trials & demonstrations of new com/nav/sur services eg. ATN, GNSS, ADS 2) Monitor global developments that may have beneficial impact on regional planning activities eg. ATN, WADGNSS, LADGNSS 3) Consolidate information on new capabilities in the CNS/ATM system, eg. FANS 1 avionics package, oceanic display systems etc. for the Sub-Groups review and action 4) Serve as a focal point for review of ongoing work of Regional formal and informal working groups that is relevant to Com/Nav/Sur eg RNP compatibility 5) Provide for co-ordinated training/seminars to keep all States informed on developments of trials and demonstrations 6) Establish a GNSS Task Force to develop a Regional Strategy for GNSS augmentation 7) Develop transition planning consistent with Regional requirements	COM/MET/NAV/SUR	Completed Completed Completed
19	RAN/3 C.9/7 (TOR 3)	Subject: Lack of adequate procedures for Exchange of OPMET data between regions Task: Exchange of OPMET data between the ASIA/PAC and other Regions.	A	1) Develop procedures and delivery scheme for exchange of OPMET data between ASIA and EUR regions Via Singapore ODREP. 2) Develop a draft proposal for amendment of the ANP and arrange amendment of the ROBEX handbook to reflect the new arrangements. 3) To develop procedure to make OPMET information available at Washington and London.	COM/MET/NAV/SUR OPMET WG	Completed Completed Completed
20	C.9/12 (TOR 3)	Subject: The need for SIGWX charts to be available in London and Washington for WAFS dissemination Task: Exchange of WAFS SIGWX charts.	A	1) Plan for the exchange of SIGWX charts between all relevant RAFCs and the London and Washington WAFC. 2) Develop transition plan for transfer of responsibilities from the RAFCs to WAFCs. 3) Coordination between RAFCs and the respective WAFCs be effected to meet time table for production of test high level SIGWX forecasts and the dates when the charts are expected to be considered operational	COM/MET/NAV/SUR WAFS Task Force States	Completed Completed Completed

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
21	RAN/3 R.10/19 (TOR 3)	Subject: Technical data not available for WAFS satellite broadcast implementation Task: Dissemination of World Area Forecast System (WAFS) products by satellite broadcast.	A	1) WAFS satellite broadcast provider States to advise ICAO of VSAT receiving equipment details. 2) ICAO to relay information to States in the region. 3) Develop draft proposal to amend the ANP as necessary. 4) States to install WAFS satellite receivers.	UK & US ICAO COM/MET States	Completed Completed Completed Completed
22	COM/MET /NAV/SUR/ SG (TOR 2)	Subject: Protection of radio frequency spectrum to ensure safety and efficiency of aeronautical services. Task: Take steps to protect the aeromobile spectrum from unauthorised interference. Task: Suppport ICAO posistion on various Agenda at WRC including protecting GNSS spectrum for aeronautical use.	A	1) Encourage States to monitor and co-operatively resolve unauthorised intrusion into aeronautical HF bands, 2) Work actively with State Telecommunications Authorities to ensure ICAO position are supported and aviation views are included in WRC deliberations.	ICAO States	Completed Completed
23	APANPIRG D. 10/13	Problem : Revision of Strategy for PA Landing System Task : Development of an up-dated strategy	A	Review the current strategy and develop an up-dated strategy taking into account : 1) standardized GBAS and SBAS 2) feasibility of GBAS to support CAT II and III operations 3) development and deployment of MMR 4) the definition of RNP for approach, landing and departure operations and 5)human, environmental and economic factors.	COM/MET/NAV/ SUR SG	Completed
24	APANPIRG D. 10/14	Problem : Lack of a general strategy for implementation of GNSS Task : Development of a more general strategy for implementation of GNSS.	A	A more general strategy for the implementation of GNSS navigation capability in the ASIA/PAC region taking into account : 1) RNP for all phases of flight 2) standardization of GNSS by ICAO through SARPs, PANS-OPS guidance material 3) human, environmental and economic factors.	COM/MET/NAV/ SUR SG	Completed

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
25	APANPIRG C. 8/21	Problem : Transition to the final phase of WAFS Task : Planning for transfer of responsibilities of the RAFCs to the WAFCs London and Washington.		Develop WAFS Transition Plan and Procedures and planning for Implementation of transfer of the RAFCs responsibilities to the WAFCs London and Washington.	COM/MET/NAV/ SUR SG WAFS Transition TF	Completed

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
26	APANPIRG C. 9/29	Problem : Lack of procedures for OPMET exchange to support the ISCS and SADIS broadcasts. Task : Planning for dissemination of ASIA/PAC OPMET data to the WAFCs London and Washington	A	Develop procedures for dissemination of OPMET data to the WAFCs for uplink on the satellite broadcasts. Planning for implementation of the procedures for OPMET exchange to support the ISCS and SADIS broadcasts.	COM/MET/NAV/ SUR SG OPMET WG	Completed 2001
27	RAN/3 C.10/11 (TOR 3)	Subject: Inadequate Ground-ground data coms. Task: Aeronautical Fixed Telecommunications Network (AFTN) management.	A	1) Develop procedures for the establishment operation and management of databases. 2) Review AFTN loading, develop possible circuit improvements and routing changes. 3) Develop alternate routing coordination procedures to take into account address stripping procedures. 4) Plan changes to the AFTN with due account to transition to ATN.	COM/MET/NAV/SUR ATN Trans. T/F COM/MET/NAV/SUR	Completed On going Completed Completed
28	RAN/3 C.11/8 (TOR 1)	Subject: Planning of ground-ground communications required for implementation of ATN Task: Integration of ground -ground communications necessary for the implementation of the aeronautical telecommunication network.	B	Plan ground to ground communications for implementation of ATN, taking into account the work of the ATNP. 1) Development of ATN Routing architecture 2) Transition Plan	ATN Trans. T/F	2001
29	RAN/3 C.11/10 (TOR 1)	Subject: Ensure effective transition to sat. coms. Task: Planning for the implementation of satellite communications.	B	In planning for the implementation of CNS/ATM take into account: 1) Requirements for an effective transition, 2) Time frame for implementing changes, 3) HF requirements after implementation of satellite communications, 4) Human factors (staffing, retraining).	COM/MET/NAV/SUR COM/MET/NAV/SUR	On-going

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
30	RAN/3 C.11/11 (TOR 1)	Subject: Lack of com facilities to support aircraft access to Met Data-bank(s) Task: Communications facilities to support aircraft access to a MET data bank(s) and automation of meteorological information for aircraft in flight (VOLMET) broadcasts.	B	In planning CNS/ATM implementation consider com facilities to support direct access to OPMET data bank(s) and automation of VOLMET broadcast.	COM/MET/NAV/SUR	2003
31	APANPIRG C.2/23 (TOR 2)	Subject: Lack of implementation of ATS voice circuits Task: Aeronautical Fixed Service (AFS) - resolution of deficiencies	A	Identify AFS deficiencies in the region and develop appropriate solution	COM/MET/NAV/SUR States concerned	On-going On-going
32	RAN/3 C.8/14 (TOR 3)	Subject: Inadequate implementation of procedures for advising aircraft on volcanic ash Task: Regional planning for implementation of international airways volcano watch (IAVW)	A	Plan implementation of IAVW procedures to ensure provision of timely information on volcanic ash to aircraft.	COM/MET/NAV/SUR WG on Volcanic Ash	On going
33	APANPIRG D. 9/21	Problem : SADIS strategic assessment Task: SADIS strategic assessment of data/information to be included in the satellite broadcast.		Review requirements for SADIS broadcasts and maintain the SADIS strategic assessment tables.	COM/MET/NAV/ SUR SG	On-going
34	APANPIRG (TOR 3)	Subject: Lack of procedure for application of MET data in ADS messages Task: Use of MET data from ADS messages	A	1) Review MET information transmitted with ADS messages 2) Develop procedures for utilization of the available MET data by operational units, MET offices and WAFCs	COM/MET/NAV/SUR COM/MET/NAV/SUR	2001 2001

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
35	(TOR 3)	Subject: To facilitate regional implementation of CNS/ATM Tasks: a) coordinate training/workshops to allow States to develop and implement new CNS/ATM procedures b) encourage States to participate in the evaluation and training of new CNS/ATM systems c) progress the adoption of WGS-84 co-ordinate system and introduction of high integrity systems for the management of the co-ordinate data d) co-ordination and resolution of issues commonly faced by States in the	A	1) identify topics for training, develop syllabi and plan training programme 2) encourage States in the evaluation and training of new CNS/ATM systems 3) co-ordinate with States and monitor progress 4) collect information and suggest methods of resolving problems commonly faced by States 5) analyse proposals for placement of monitoring stations in the region	COM/MET/NAV/ SUR SG CNS/ATM IC SG	On-going On-going On-going On-going On-going
36	APANPIRG D. 4/46 RAN/3 C.12/3 APANPIRG 5/3 (TOR 3)	Subject: Provision of adequate CNS/MET services Task: Monitor CNS/ATM systems research and development, trials and demonstrations in the fields of CNS/MET and facilitate the transfer of this information and expertise between States.	A	• Encourage States to conduct R&D, trials & demonstrations of new CNS/Met services • Monitor global developments that may have beneficial consequences on regional planning activities • Consolidate information on new capabilities in the CNS/ATM system, for the Sub-Groups review and action • Serve as a focal point for review of ongoing work of Regional formal and informal working groups that is relevant to CNS/MET • Provide for coordinated training/seminars to keep all States informed on developments of trials and demonstrations	CNS/MET	On-going
37		Subject : Transition to the final phase of WAFS Task : Implementation of the transition to the final phase of WAFS	A	1) Development of guidelines for the use of BUFR and GRIB codes for the production of WAFS products. 2) Planning and coordinating the transfer of SIGWX and WIND/TEMP charts from the current T4 facsimile format to BUFR and GRIB format. 3) Development of a regional training programme for the operational use of BUFR and GRIB. 4) Participate in the development and implementation of an adequate WAFS back-up system for dissemination of WAFS products in the Asia/Pacific Regions.	COM/MET/NAV/SUR SG WAFS Transition Task Force	2002 2004 2003 2004

ACTIONS TAKEN ON DECISIONS/CONCLUSIONS OF COM/MET/NAV/SUR SUB-GROUP IN CNS FIELDS

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	Deci./Concl. No. of APANPIRG			
Deci. 3/1	Deci. 10/10		**Decision 10/10 - Revision of the Subject/Tasks List of ATN Transition Task Force** That, the Subject /Tasks List of the ATN Transition Task Force be amended as shown in Appendix A to the Report on Agenda Item 2.2	Second ATN Transition Task Force Meeting held in March 2000 was provided the updated Subject/Tasks List.
Concl. 3/2	Concl. 10/12		**Conclusion 10/12 - Need to monitor AFTN circuit loading** That, States concerned closely monitor loading conditions on the following AFTN circuits and provide the results of monitoring and plans for upgrading of the circuits to ICAO. 1. Manila/Singapore 2. Nadi/Apia-Falecolo 3. Nadi/Noumea 4. Hong Kong/Manila 5. Kuala Lumpur/Madras	State letter was issued to urge concerned States to take appropriate action and was also followed up at the 12th Bay of Bengal ATS Coordination Group Meeting held in Bangkok from 5 to 9 June 2000. States have taken action to upgrade the circuits.
Deci. 3/3	Concl. 10/33	ANC	**Conclusion 10/33 - Asia/Pacific Regional Plan For the New CNS/ATM Systems** That, the Revised Draft Asia/Pacific Regional Plan For the New CNS/ATM Systems, be adopted as the Asia/Pacific Regional Plan for the New CNS/ATM Systems and be circulated to States. Noted the conclusion and requested the Secretary General to take it into account in the global harmonization of CNS/ATM System.	ATN Transition Guidance Materials were incorporated in Chapters 5 and 7 and was circulated to States.
Deci. 3/4	Deci. 10/24		**Decision 10/24 - Amendment to the Subject/Tasks List in the COM/MET/NAV/SUR fields** That, the updated Tasks List in the COM/MET/NAV/SUR fields presented in Appendix K to the report on Agenda Item 2.2 be adopted as the work programme of the Sub-Group.	Updated Subject/Tasks List is provided in Attachment to WP/5 was noted.

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	Deci./Concl. No. of APANPIRG			
Deci. 3/5	Concl. 10/37		**Conclusion 10/37 - Development of general contingency plans** That, The Asia Pacific Regional and State Y2K Contingency Plans and SLOA's or MOUs be used to form the basis on which to develop general contingency arrangements which will permit the continuation of air traffic in the event of any significant degradation of air traffic services and systems.	Necessary action being taken by concerned Sub - Groups.
Concl. 3/6	Concl. 10/36	ANC	**Conclusion 10/36 -Asia/Pacific Regional Y2K Contingency Plan** That, the Asia/Pacific Regional Y2K Contingency Plan, including Attachments and Annexes to the plan to be used during the Year 2000 change-over period, is endorsed. Noted the Conclusion is relation to ICAO/IATA action programme that has addressed the Y2K date change problem.	The Regional Y2K Contingency Plan was distributed to States and follow up actions were taken to urge States to complete actions.
Concl. 3/7	Concl. 10/35		**Conclusion 10/35 -Y2K readiness status** That, States, who have not provided status of Y2K readiness in accordance with action agreed at the Y2K Programme Managers Meeting held in New Delhi in 1998, be requested to urgently provide status of Y2K readiness to the ICAO Regional Office.	Follow up actions were taken through correspondence and visits to States to ensure compliance. Meeting of the Managers of the AFTN COM Centres on Y2K Readiness was held in Singapore from 26 to 28 October 1999.
Concl. 3/8	Concl. 10/11	ANC	**Conclusion 10/11 - Guidance Material for Ground Element in ATN Transition** That, the Guidance Material for Ground Element in ATN Transition be adopted and circulated to States. Noted the Conclusion and requested the Secretary General to take into account in relation to the development of a consolidated, comprehensive ATN Manual.	Guidance Material was circulated to States in February 2000.

Report Reference		Action by ANC/Council	Action Taken by States/ICAO	Action Taken by States/ICAO
Deci./Concl. of SG	**Deci./Concl. No. of APANPIRG**			
Deci. 3/17			**Ground – based Regional Augmentation System** That, the results of a Ground-based Regional Augmentation System, developed in accordance with the Regional Augmentation Strategy, be presented by expert from Australia to the next COM/MET/NAV/SUR Sub-Group Meeting for review.	Expert from Australia presented the result to the meeting.
Concl. 3/18	Deci. 10/13		**Decision 10/13 - Strategy for the Provision of Precision Approach and Landing Guidance Systems** That, the current Asia/Pacific Regional Strategy for the Provision of Precision Approach and Landing Guidance be reviewed and an updated strategy be developed, taking into account: - the standardization of GBAS local area augmentation systems and SBAS wide area augmentation systems by ICAO; - feasibility of GBAS systems to support category II and III operations; - the development and deployment of multimode receivers; - the definition of Required Navigation Performance for approach, - landing and departure operations; and - human, environmental and economic factors.	Included in the Subject/Tasks List of the COM/MET/NAV/SUR Sub-Group.
Concl. 3/19	Deci. 10/14		**Decision 10/ 14 - Strategy for the Provision of GNSS Augmentation in the ASIA/PAC Region** That, the Strategy for the Provision of GNSS Augmentation in the ASIA/PAC Region be amended and adopted as stated in Appendix B to the Report on Agenda Item 2.2; and a more general strategy for the implementation of GNSS navigation capability in the Asia/Pacific Region be developed, taking into account: - required Navigation Performance for all phases of flight; - the standardization of GNSS by ICAO through published Standards, Recommended Practices, PANS and guidance material; - the ability of aircraft to achieve RNP requirements through the use of on-board systems, - and human, environmental and economic factors.	Included in the Subject/Tasks List of the COM/MET/NAV/SUR Sub-Group.

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	**Deci./Concl. No. of APANPIRG**			
Concl. 3/20	Concl. 10/27	ANC	**Conclusion 10/27 - ASIA/PAC Basic ANP and FASID** That, the draft ASIA/PAC Basic ANP and FASID be updated and processed in accordance with established procedures. Noted the Conclusion and requested the Secretary General to arrange for the completion, approval and publication of the document as a matter of priority in accordance with established procedures.	Basic ANP and FASID were updated and a proposal for amendment to the plan has been circulated.
Concl. 3/21	Concl. 10/15	ANC	**Conclusion 10/ 15 - ICAO Position to World Radiocommunication Conference-200 (WRC-2000)** That, States, a) in preparing their national proposals to the ITU WRC-2000 include, to the maximum extent possible, the material contained in the ICAO Position; b) undertake to provide for aviation authorities to fully participate in the development of States positions to ensure support for the ICAO position at the WRC-2000; c) ensure, to the extent possible, that their delegations to the APT meetings and the WRC-2000 include representatives of their civil aviation administrations; and d) be urged to present the current status of their preparation for WRC-2000 at the 35th DGCAs Conference. Noted the Conclusion and requested the Secretary General to accord highest priority to ICAO's role in safeguarding the aeronautical interest at WRC-2000	- Follow up actions were taken at various stages. - AMCP WG-F Meeting was hosted. - 35th DGCA Conference formulated an action item 35/9 based on the paper presented by the Secretariat to provide necessary support to ICAO Position - ICAO effectively participated at all the four preparatory meetings conducted by APT. - Almost all of the ICAO Positions were supported in the APT Position paper for the ASIA/PAC region presented at WRC-2000. - Outcome of the WRC-2000 fully satisfied ICAO Position.

ACTIONS TAKEN ON DECISIONS/CONCLUSIONS OF COM/MET/NAV/SUR SUB-GROUP IN MET FIELD

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	Deci./Concl. No. of APANPIRG			
Deci. 3/4	Deci. 10/24		**Decision 10/24 - Amendment to the Subject/Tasks List in the COM/MET/ NAV/SUR fields** That, the updated Tasks List in the COM/MET/NAV/SUR fields presented in Appendix K to the report on Agenda Item 2.2 be adopted as the work programme of the Sub-Group.	Updated Subject/Tasks List provided in Attachment to WP/5 was noted.
Concl. 3/6	Concl. 10/36	ANC	**Conclusion 10/36 -Asia/Pacific Regional Y2K Contingency Plan** That, the Asia/Pacific Regional Y2K Contingency Plan, including Attachments and Annexes to the plan to be used during the Year 2000 change-over period, is endorsed. Noted the Conclusion is relation to ICAO/IATA action programme that has addressed the Y2K date change problem.	The Regional Y2K Contingency Plan was distributed to States and follow up actions were taken to urge States to complete actions.
Concl. 3/9	Concl. 10/16		**Conclusion 10/16 - SADIS operational focal point in user States** That, SADIS User States nominate an operational person involved with day-to-day SADIS operations in that State, to act as the SADIS operational focal point, and to provide the person's name, official title and contact details. Note : *a) to assist States in nominating the appropriate officer, the request to States should indicate clearly that the SADIS operational focal point would be expected to be available to respond to queries and receive information from the SADIS provider State and Secretary, SADISOPSG on operational matters, and maintain contact with any other SADIS users in the State concerned; and* *b) on receipt of the information from States, the Secretary of the SADISOPSG should provide the information to the SADIS provider State, and include the list of the SADIS operational focal points in a future amendment to the SADIS User Guide.*	The SADIS user States have been invited to nominate an operational person to act as the SADIS focal point. Nominations are being received.

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	Deci./Concl. No. of APANPIRG			
Deci. 3/10	Deci. 10/17		**Decision 10/17 - SADIS strategic assessment tables** That, the ASIA/PAC SADIS strategic assessment tables, as given in Appendix D to the report on Agenda Item 2.2, be adopted and the SADISOPSG be advised accordingly.	The ASIA/PAC SADIS strategic assessment tables were review by the SADISOPSG/5 meeting.
Concl. 3/11	Concl. 10/18		**Conclusion 10/18 - ASIA/PAC requirements for WAFS products** That, a) Tables MET 5 and MET 6 together with the associated explanatory notes, given in Appendices E and F to the report on the Agenda Item 2.2 replace the existing Tables MET 5 and MET 6 of the ASIA/PAC ANP (Doc 9673) and be used in the FASID; b) the relevant part of the regional meteorological procedures given in the introductory text to Part IV - Meteorology, of the ASIA/PAC ANP be amended as shown at Appendix G to the report on the Agenda item 2.2 and be used in the draft ASIA/PAC Basic ANP; and c) the text for inclusion in Part VI - Meteorology, of the draft ASIA/PAC FASID be amended as shown in Appendix H to the report on the Agenda Item 2.2.	Draft ASIA/PAC Basic ANP and FASID have been amended accordingly.
Concl. 3/12	Concl. 10/19	C	**Conclusion 10/19 - Future development of the WAFS** That, ICAO give consideration to the future development of the WAFS with a view of meeting the States' requirements for WAFS and non-WAFS products after transition to the final phase of WAFS and the RAFCs cease to operate. Noted the conclusion and requested the Secretary General to arrange for a study on how to meet any non-WAFS requirements indicated by States, in response to the survey requested in Conclusion 10/20.	Proposal is being studied by the Secretariat with assistance of the WAFSSG. WAFSSG/7 (7 October 1999) considered the matter.

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	Deci./Concl. No. of APANPIRG			
Concl. 3/13	Concl. 10/20		**Conclusion 10/20 - Survey on future requirements of States for the WAFS and non-WAFS products and services** That, States define their future requirements for the WAFS and non-WAFS products and services so that all requirements be met after transition to the final phase of the System.	It is expected that States will advise ICAO regarding their future requirements for the WAFS and non-WAFS products and services.
Concl. 3/14	Concl. 10/21	ANC	**Conclusion 10/21 - Internet access to the WAFS products and OPMET data** That, ICAO consider developing the policy for use of the Internet by States to obtain the WAFS products and OPMET data for operational purposes. Noted the conclusion and its relationship to APIRG/12 Conclusion 12/27 and requested the Secretary General to consider developing a uniform policy for the use of the Internet by States to obtain WAFS products and OPMET data for operational purposes, as well as for the dissemination of AIS products.	The Uniform policy for the use of the Internet by States for operational purposes is being developed by the Secretariat as requested by the ANC.
Concl. 3/15	Concl. 10/22		**Conclusion 10/22 - Dissemination of ASIA/PAC OPMET data to WAFC Washington** That, a) Tokyo ROBEX OPMET Data Bank forward ASIA/PAC METAR bulletins to the WAFC Washington; b) Brisbane and Nadi ROBEX OPMET Data Bank forward ASIA/PAC TAF bulletins to the WAFC Washington; and c) The operational procedures and the respective responsibilities of the data banks to facilitate distribution of the ASIA/PAC OPMET data to the WAFCs London and Washington be as shown in Appendix I to the report on the Agenda Item 2.2.	The procedure is being implemented by the respective ROBEX OPMET Data Banks.
Concl. 3/16	Concl. 10/23		**Conclusion 10/23 - Revision of the ROBEX Scheme** That, in order to facilitate distribution of the ASIA/PAC OPMET information to the WAFCs London and Washington for uplink to the satellite broadcasts, the ROBEX Scheme be revised as shown in Appendix J to this report on Agenda Item 2.2.	The revised ROBEX Scheme is being implemented. The collection areas of some ROBEX Centres have been extended.

Report Reference		Action by ANC/Council	Decision/Conclusion/Action Taken	Action Taken by States/ICAO
Deci./Concl. of SG	**Deci./Concl. No. of APANPIRG**			
Concl. 3/20	Concl. 10/27	ANC	**Conclusion 10/27 - ASIA/PAC Basic ANP and FASID** That, the draft ASIA/PAC Basic ANP and FASID be updated and processed in accordance with established procedures. Noted the Conclusion and requested the Secretary General to arrange for the completion, approval and publication of the document as a matter of priority in accordance with established procedures.	Basic ANP and FASID were updated and a proposal for amendment to the plan has been circulated.

OUTSTANDING CONCLUSIONS OF APANPIRG IN THE COM/MET/NAV/SUR FIELDS

Report Reference ---------- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ Action Taken	Action by States/ICAO	Status
C.2/25		**Provision of RCAG VHF in KABUL FIR**	Afghanistan is in the process of restoring basic AFS/AMS COM facilities. The AFTN, ATS direct speech circuits and RCAG VHF expected to be implemented with the assistance of IATA by the middle of 2000.	To be completed in October 2000
C.4/28		**Implementation of the Dhaka/Yangon switched ATS speech circuit**	Direct circuit implemented using VSAT.	Completed
C.4/29		**Implementation of ATS speech communication requirements**	Circuits have been implemented using IDD telephone. Further action required to be taken by Afghanistan and Pakistan. Agreement has been reached by States concerned to establish a VSAT link. Expected to be implemented by October 2000.	To be completed in October 2000
C.5/19	C	**Need for technical assistance to support WAFS implementation in the ASIA/PAC Regions** Noted the conclusion and requested the Secretary General to take action as appropriate.	The use of SADIS and ISCS/2 by ASIA/PAC States has continued to grow and further expansion is expected. Implementation of the SADIS and ISCS/2 is being monitored to define the extent of the assistance required.	On-going
C.5/23	C	**Operation of the OPMET data banks as an OPMET Data Regional Exchange Points (ODREP) under the ROBEX Scheme** Noted the conclusion on the understanding that necessary co-ordination would be made with the APIRG and GREPECAS.	- OPMET data banks have been implemented and most of the banks accepted responsibility to operate as ODREPs. - ROBEX Handbook has been amended to reflect operation of OPMET data banks/ODREPs - New Table MET 4C - OPMET Data Banks has been included in the draft ASIA/PAC FASID.	On-going
C.6/27	ANC	**Areas of Responsibilities of the Designated OPMET Data Banks to Support the ROBEX Scheme** Noted the conclusion with the understanding that its substance will be incorporated in a proposal to amend the relevant regional air navigation plans.	OPMET Data Banks have been implemented. Implementation of the revised ROBEX Scheme has been delayed due to partial implementation of some functions of data banks. The AFS/AFTN Management Task Force/4 Meeting agreed that the revised scheme be implemented within the area of responsibility of any particular data bank following its full implementation. The revised ROBEX Scheme has been implemented by the Bangkok OPMET data bank	On-going

Report Reference ---------- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ Action Taken	Action by States/ICAO	Status
C.6/28	ANC	**Inter-regional Exchange of OPMET Information** Noted the conclusion and its relationship to APANPIRG Conclusion 5/23, and requested that, in their consideration of the proposal, the APIRG, GREPECAS and MIDANPIRG should take account of existing AFTN entry/exit points.	Singapore OPMET Data Bank has implemented the switch of EUR TAF bulletins to the ROBEX Centres in the ASIA/PAC Region. Tokyo OPMET Data Bank has started to switch some of the TAF bulletins from U.S. and Canada to the ROBEX Centres. MID OPMET data is available in BKK OPMET Data Bank.	Completed
C.8/15		**Amendment to EUR-ASIA/PAC AFTN Routing.**	Co-ordination was completed and all centres concerned implemented agreed routing effective 15 November 1999.	Completed
C.8/27	ANC	**Volcanic Ash Warning System** Noted the conclusion and requested the Secretary General to consider the proposal.	a) Proposals developed by the SG were forwarded to the Secretary of the Volcanic Ash Warning SG (VAWSG) and WAFSSG; b) Some of the proposals were considered by Volcanic Ash Workshop (France, May 1998) and Volcanic Ash Warnings Study Group (VAWSG); and c) Implementation of the International Airways Volcano Watch in the ASIA/PAC was reviewed by the COM/MET/NAV/SUR SG.	Completed
C.9/17	ANC	**ICD for Radar Data Exchanges** Noted the conclusion and requested the Secretariat to take action as appropriate, including examination of the need to develop SARPs related to radar data exchange.	- Tables containing SAC allotment for States in the ASIA/PAC region and the guidance material or allocation of SIC by States for individual facility were sent to States in the region. - The tables containing both SAC and SIC has been issued as a Supplement to the ASTERIX ICD for ASIA/PAC region.	Completed
C.9/18		**Operational efficacy of the ISCS/2**	- Proposal to carry out a survey on the operational efficacy of the ISCS/2 was forwarded to the ISCS Provider State for review and consideration. - The United States was invited to review the proposed survey form and to provide comments.	2001
C.9/22		**Location of two-way VSATs (SADIS and ISCS) at volcanic ash advisory centres (VAACs)**	The VAAC provider States, namely Australia, Japan, New Zealand and United States have been invited to consider the installation of two-way VSATs.	Completed
C.9/25		**SADIS enhanced two-way VSAT test programme**	- Thailand has advised ICAO that it would be unable to participate in the test programme. - The new proposal for a test-site should be developed.	Completed Completed

Report Reference ---------- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ Action Taken	Action by States/ICAO	Status
C.9/26		**Amended ASIA/PAC WAFS Transition Plan and Procedures**	- The WAFS Transition Plan and Procedures have been amended; and - The ASIA/PAC WAFS Transition Plan and Procedures are being successfully implemented in co-ordination between the RAFCs and WAFCs provider States and with assistance of the WAFS Task Force.	Completed
C.9/30	ANC	**Global exchange of OPMET messages** Noted the conclusion and requested the Secretariat to develop a proposal to amend Annex 3 and the air navigation plans to provide for global exchange of OPMET information using all elements of the aeronautical fixed service, as appropriate.	Proposal for amendment to Annex 3 regarding global exchange of OPMET data was developed by the Secretariat and forwarded to States for comments.	2001
C.9/32	C	**GNSS Frequency Protection** Noted the conclusion and its relation to ITU World Radio Conference (WRC-2000).	Action was taken in accordance with the Conclusion. States were advised to take necessary actions to support ICAO Position at APT Meetings and at WRC 2000.	Completed
C.9/34	C	**Draft Basic ASIA/PAC ANP and Draft ASIA/PAC FASID** Noted the conclusion and expressed appreciation to the States concerned.	The documents reviewed/verified by States. A proposal for amendment of the plan is processed in accordance with established procedures.	Completed

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

Key Priority	Description	Target Date	Sub-group	Status
~~ATN Transition~~	~~The development of ATN transition guidance material and the development of an ATN transition plan is required~~	~~End 1999~~	~~COM/MET/NAV/SUR~~	~~Completed 1999~~
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	On-going	All	CNS/ATM Material not yet mature enough for incorporation into FASID
GNSS Augmentation Strategy	To update the current regional strategy to reflect the present operational requirements, the state of technology and the stakeholders involved	APANPIRG/10 (1999)	COM/MET/NAV/SUR	Initial review undertaken in 1999. Final review ~~in Jan. 2000~~at COM/MET/NAV/SUR SG/4. Completed.
~~GNSS Frequency Protection~~	~~To ensure the aeronautical radio spectrum is available to satisfy future needs of international civil aviation and in particular to protect the GNSS frequency spectrum which is vital to the safe and efficient operation of the CNS/ATM system~~	~~On-going~~	~~All~~	~~Progressed by all Sub-groups and APANPIRG during 1999~~
~~Y2k & GPS Z Count~~	~~To alert States to the need to undertake activities, including training, to address the Y2k & GPS Z Count (week 1024 Rollover) issues with regard to aviation and associated systems. Also to ensure the establishment of mechanisms to ensure that appropriate inter-Regional and intra-Regional contingency planning is in place to cater for unforeseen problems~~	~~Immediate~~	~~All~~	~~GPS Z Count event has occurred. (users still need to check GPS receivers for Y2k compliance).~~ ~~Major Y2k effort underway.~~

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.	Immediate	ATS/AIS/SAR	Recent meeting between China and Viet Nam under ICAO auspices to explore proposals
~~Updating of Major Geographical Areas~~	~~The major geographical areas are the primary planning and implementation tools for CNS/ATM in the Region and therefore need to be current. The geographical area Tables of Operational Enhancements are designed to ensure the co-ordinated implementation of CNS/ATM systems resulting in a seamless environment for airspace users.~~	~~Each APANPIRG meeting~~	~~All~~	~~Tables updated 1999~~
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 (1 Jan 1998)	ATS/AIS/SAR	Implementation monitored at each meeting
RVSM Implementation	To provide more efficient flight profiles and to increase airspace capacity in conjunction with the implementation of CNS/ATM.	24 Feb 2000 (Pacific) Feb 2002 (South China Sea)	ATS/AIS/SAR	RVSM Task Force co-ordinating implementation
Reduced Separation Minima (Benefits)	To increase the efficient use of airspace and enhance the safety and efficiency of air traffic management.	Immediate	ATS/AIS/SAR	50/50 progressively being implemented 30/30 work by ISPACG being monitored
Human Factors Training	To ensure that the introduction of new technology and equipment recognizes the Human Factors aspects.	On-going	All	Human Factors in the provision of ATS Seminar planned for 1999 deferred to 2000 due Y2k effort

RNP Implementation	Global standard for navigation is seen as a prerequisite for many CNS/ATM implementation activities.	On-going	ATS/AIS/SAR & CNS/ATM/IC	RNP implemented NOPAC, CENPAC, Tasman Sea. Planned for CEP and South China Sea. RNP/RNAV seminar planned for 1999/2000
The implementation of ADS for the enhancement of ATM & Safety	Standards, concept of operations and operating procedures are required immediately to enable the utilization of ADS functionality currently in place and planned both on the ground and in the air.	Jun 2000	ATS/AIS/SAR	Work in initial stages
Parallel Offset Navigation	To ensure that the use of parallel offset navigation practices are safely catered for in the implementation of CNS/ATM and RVSM.	Immediate	ATS/AIS/SAR	Wake turbulence offset under RVSM analysed by RVSM Task Force
Guidance Material for Certification of Ground-Based and Airborne Equipment	Guidance material is required for ATS providers, regulators and airspace users regarding the certification of CNS/ATM ground-based and airborne equipment. Consideration should also be given to the need for guidance material for end-to-end certification of CNS/ATM systems.	On-going	All	Work yet to commence
Civil Military Co-operation	There is a need to ensure joint civil/military participation in the planning and implementation of CNS/ATM to ensure the future compatibility of integrated civil/military operations and to encourage both civil and military to work together to balance mission needs with available airspace.	On-going	All	Civil Military Co-operation seminar held 1998

Air Traffic Management	A regional concept of operations for ATM needs to be developed in order to achieve optimization of service, to meet the demands of air traffic and safety.	APANPIRG/11 (2000)	ATS/AIS/SAR	Work yet to commence
Regional Approach to CNS/ATM Training	A Regional approach to CNS/ATM training is required in order to achieve a seamless regional implementation of the new technology.	On-going	All	CNS/ATM Training & Human Resources Development Task Force formed and Regional Strategy Developed 1999
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.	On-going	All	Seminars planned
Preparation for WRC2003	The cooperative participation of States is required with their respective communications authority, regional groups such as the ATP and at the WRC, preparatory meetings and study groups to ensure that aviation spectrum requirements are fulfilled.	On-going until WRC2003	All	AMCP WG-F now meeting in August APT commencing preparation in Sept. 2000.

AIR NAVIGATION SHORTCOMINGS AND DEFICIENCIES IN THE CNS 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**	**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 2001	A
RCAG VHF at Port Blair	India	RCAG station to be established at Port Blair linked to Calcutta and Chennai ACCs	1992	No Change D	HF air ground channels are used sometimes to exchange co-ordination messages. Frequency congestion is reduced as ATS DSCs are used for coordination.	Installation VSAT in progress at Port Blair, Calcutta and Chennai to operate RCAG station.	Airports Authority of India	Target date being changed each time the status was reviewed and currently established September 2000.	A

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.	CAA Bangladesh and Airports Authority of India	End of 2000	A

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. Most of the ATS DSCs use IDD and operational requirement is not met.	1999	D	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.	Satellite link progressively introduce to support RCAG station. IDD Hotlines have been introduced and has resulted in improvement in IDD communication, satisfying requirements in most cases. HF congestion reduced due to enhancement in IDD communication and to some extent due to the use of CPDLC.	Airports Authority of India	End of 2000	A
Reliable NDB***	Maldives	Male NDB is consistently unserviceable	1999	Implemented D			Male Airports Authority	Problems rectified in 1999.	
Provide VHF*** coverage in the Ulaar Baatar FIR	Mongolia	RCAG stations to be established and operated using satellite link to provide full VHF coverage in the Ulaar Baatar FIR	1992	Implemented D		Mongolia is planning to have full VHF coverage under the National Air Navigation Development	Civil Aviation Authority of Mongolia	Completed in April 1999	

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 Fourth quarter of 2000.	A
Reliable VOR/DME***	Nepal	VOR signal scalloping between 15 and 8 DME	1998	Implemented D	Corrective action required to overcome problem and conduct flight check	Scalloping problem corrected and flight checked.	Civil Aviation Authority of Nepal	Problem rectified since 18 July 1999.	
Harmful radio Interference	Philippines	Manila approach and departure frequencies suffer harmful interference	1999	No Change D		Action has been initiated by Air Transportation Office with concerned authority to eliminate the problem	Air Transportation Office	As soon as possible.	A

* S, D = Shortcomings, Deficiencies

**Priority — Description

U = *Urgent* requirement having a *direct* impact on *safety* and requiring *immediate* corrective action.

A = *Top priority* requirements *necessary* for air navigation safety.

B = *Intermediate* requirements *necessary* for air navigation *regularity* and *efficiency*.

*** = Proposed to be deleted

AIR NAVIGATION SHORTCOMINGS AND DEFICIENCIES IN THE MET 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**	**Target for completing**	**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.	Directorate of Civil Aviation, Kiribati Civil Aviation Authority, Fiji COM/MET/NAV /SUR SG	To be determined	A

Identification		Shortcomings and deficiencies				Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Implementation status (S, D)***	**Remarks**	**Description**	**Executing body**	**Target for completing**	**Priority for action****
Requirements for *** exchange of OPMET information. ASIA/PAC ANP, Table MET 2.	Mongolia	TAFs regularly issued by MET office of Ulaanbatar International Airport, however, not regularly available for international OPMET exchange under the ROBEX Scheme	1999	S	Reported by Mongolia that international flights to Ulaanbator delayed due to lack of OPMET data. Action to be taken as proposed by the Administration	Action is to be taken to amend the ROBEX Scheme	a)APANPIRG considered proposal to amend the ROBEX Scheme b) China and Mongolia to implement proposal developed	1999	U
a) Reporting of information on volcanic eruptions to civil aviation units. Provision of Annex 3, Chapter 4. b) International airways volcano watch (IAVW) operational procedures.	Indonesia Philippines	Information on volcano activities not always reach civil aviation units due to lack of fixed communications with volcano observatories	1995	D	a) Observed by States concerned b) Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)		a) Volcanic Ash Warning Study Group (VAWSG) to develop proposal. b) ICAO Regional Office to monitor developments on this subject.	2000	A
a) Service for operators	Cambodia	VSATs for	1999	D	Expected lack of	States consider	Civil Aviation	2001	A

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

Identification		Shortcomings and deficiencies				Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Implementation status (S, D)***	**Remarks**	**Description**	**Executing body**	**Target for completing**	**Priority for action****
a) SIGMET information Provision of Annex 3 Chapter 7. b) Requirements for dissemination of SIGMETs, including SIGMETs for volcanic ash ASIA/PAC ANP (FASID) Table MET 2A c) International airways volcano watch (IAVW) operational procedures.	Bangladesh Cambodia Fiji India Indonesia Lao Malaysia Myanmar Nepal Papua New Guinea Philippines Sri Lanka	Requirements for issuance and proper dissemination of SIGMETs, including SIGMET for volcanic ash, have not been fully implement	2000	a) D b) S	a) reported by airlines, b) noted by Volcanic Ash Advisory Centres	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	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	2001	A

Table CNS 1A - AFTN CIRCUITS

Explanation of the Table

Column:

1. The AFS station or facility of individual State, listed alphabetically. Each circuit appears twice in the Table.

2. Geographical Area

3. Category of circuit

M - Main trunk circuit connecting Main AFTN communication centres.
T - Tributary circuit connecting Main AFTN communication centre and AFTN stations to relay or retransmit AFTN traffic.
S - AFTN circuit which is used to transmit and receive AFTN traffic to and from a Main or Tributary AFTN communication centre directly connected to it and does not relay AFTN traffic except for the purpose of serving national station(s).

4 and 8 Type of circuit provided:

HF	High frequency radio teletype
LTT/a	landline teletypewriter, analogue (eg. cable, microwave)
LTT/d	landline teletypewriter, digital (eg. cable, microwave)
LDD/a	landline data circuit, analogue (eg. cable, microwave)
LDD/d	landline data circuit, digital (eg. cable, microwave)
SAT/n/a/d	satellite link, the number indicates the number of hops in the circuit: Also use/a for analogue or/d for digital appropriate to the tail circuit.

5 and 9 Circuit signalling speed, current or planned.

6 and 10 Circuit protocols, current or planned.

7 and 11 Data transfer code (syntax), current or planned.

ITA-2	International Telegraph Alphabet No. 2 (Baudot code).
IA-5	International Alphabet No. 5 (ICAO 7 - unit code).
CBI	Code and Byte Independent (ATN compliant).

12 Target date of implementation

13 Remarks

Note 1: Circuit is required for alternate routing and for national routing for international traffic.
Note 2: Requirements exist for speech and data (S + DX) communication.

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
AMERICAN SAMOA											
PAGO PAGO - S/NSTU											
United States/KSLC	S	SAT/d	2400 bps	X.25	IA-5						
AUSTRALIA											
BRISBANE - M/YBBB											
Christchurch/NZCH	T	LDD/d	2400 bps	X.25	IA-5						Note 2
Honiara/AGGG	S	LTT	75 baud	None	IA-5						Note 2
Jakarta/WIII	S	SAT/d	9600 bps	X.25	IA-5						Note 1,2
Mauritius/FIMP	S	LTT	50 baud	None	ITA-2						
Nadi/NFFN	M	LDD/d	2400 bps	IA-5	IA-5						Note 2
Nauru/ANAU	S	SAT/d	2400 bps	X.25	IA-5						Note 2
Port Moresby/AYPM	S	SAT/d	9600 bps	X.25	IA-5						Note 2
Port Vila/NVVV	S	LTT	300 baud	None	ITA-2						SITA
Santiago/SCSC	M					LDD/d	2400 bps	X.25	IA-5	06/01	Current routing via USA
Singapore/WSSS	M	LDD/d	600 baud	COP-B	IA-5	LDD/d	2400 bps	X.25	IA-5	12/00	
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						
BANGLADESH											
DHAKA - S/VGZR											
Bangkok/VTBB	S	SAT/d	300 baud	None	IA-5						
Calcutta/VECC	S	HF RTT	50 baud	None	ITA-2	LTT	50 baud	None	ITA-2	12/00	Note 1,2
BHUTAN											
PARO - S/VQPR											
Mumbai/VABB	S	SAT/a	50 baud	None	ITA-2						Dial-up
BRUNEI DARUSSALAM											
BRUNEI - S/WBSB											
Singapore/WSSS	S	LTT	75 baud	None	ITA-2	LDD	300 baud	COP-B	IA-5	12/00	
Kota Kinabalu/WBKK	S	LTT	50 baud	None	ITA-2	LDD/d	300 baud	COP-B	IA-5	12/00	Note 1,2
CAMBODIA											
PHNOM PENH - S/VDPP											
Bangkok/VTBB	S	SAT/d	300 baud	None	ITA-2						Note 2
CHINA											
BEIJING - M/ZBBB											
Guangzhou/ZGGG	M	LDD	9600 bps	X.25	IA-5						
Karachi/OPKC	M	LTT	50 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	
Kathmandu/VNKT	S	SAT/d	300 baud	None	IA-5						
Kunming/ZPPP	S	LDD/d	9600 bps	X.25	IA-5						
Russian Fedration/UHHH	M					SAT/d	2400 bps	None	IA-5	09/00	via Khabarovsk
Pyongyang/ZKKK	S	SAT/d	300 baud	None	IA-5						

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Seoul/RKSS	S					SAT/d	9600 bps	X.25	IA-5	12/01	Note 1
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
Ulaan Baatar/ZMUB	S	SAT/d	1200 bps	None	IA-5						Note 2
GUANGZHOU-M/ZGGG											
Beijing/ZBBB	M	LDD	9600 bps	X.25	IA-5						
Hong Kong/VHHH	M	LDD/d	1200 bps	None	IA-5						Note 1
Macau/VMMC	S	SAT/d	2400 bps	None	IA-5						
KUNMING - S/ZPPP											
Beijng/ZBBB	S	LDD/d	9600 bps	X.25	IA-5						
Yangon/VYYY	S					SAT/d	300 baud	None	IA-5	12/00	Note 1, 2
TAIBEI - S/RCTP											
Hong Kong/VHHH	S	LDD/d	4800 bps	X.25	IA-5						
Manila/RPLL	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	Note 1, 2
Naha/ROAH	S	LDD/d	4800 bps	X.25	IA-5						
HONG KONG SAR											
HONG KONG-M/VHHH											
Bangkok/VTBB	M	LDD/d	2400 bps	X.25	IA-5						
Guangzhou/ZGGG	M	LDD/d	1200 bps	None	IA-5						Note 1
Ho-Chi-Minh/VVTS	S	SAT/a	300 baud	None	ITA-2						Note 1, 2
Macau/VMMC	S	LDD/d	2400 bps	None	IA-5						
Manila/RPLL	S	LTT	2x75 baud	None	ITA-2	LDD/d	300 baud	None	IA-5	12/00	
Taibei/RCTP	S	LDD/d	4800 bps	X.25	IA-5						Note 2
Tokyo/RJAA	M	LDD/a	9600 bps	X.25	IA-5						
MACAU SAR											
MACAU - S/VMMC											
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5						
Guangzhou/ZGGG	S	SAT/d	2400 bps	None	IA-5						
COOK ISLAND											
RAROTONGA-S/NCRG											
Christchurch/NZCH	S	LDD/d	2400 bps	None	IA-5						
DPR KOREA											
PYONGYANG-S/ZKKK											
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						
FIJI											
NADI - M/NFFN											
Apia/NSFA	S	LTT	50 baud	None	ITA-2						Note 2
Brisbane/YBBB	M	LDD/d	2400 bps	X.25	IA-5						Note 2
Christchurch/NZCH	S	LTT	2400 bps	X.25	IA-5						Note 2

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Funafuti/NGFU	S					LTT	50 baud	None	ITA-2	04/01	
Noumea/NWWW	S	LTT	2400 bps	None	IA-5						Note 2
Tarawa/NGTT	S					LTT	2400 bps	None	IA-5	12/00	
Tongatapu/NFTF	S	LTT	50 baud	None	ITA-2						
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						Note 2
Wallis Is./NLWW	S					LTT	50 baud	None	ITA-2		
										when traffic justifies	Current routing via Noumea
FRENCH POLYNESIA (FRANCE)											
PAPEETE/NTAA											
Christchurch/NZCH	S	SAT/d	300 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	
INDIA											
MUMBAI - M/VABB											
Bangkok/VTBB	M	SAT/a	2400 bps	X.25	IA-5						
Calcutta/VECC	S	LTT	2x75	None	ITA-2						
Colombo/VCCC	M	SAT/a	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	via PVC
Karachi/OPKC	M	SAT/a	200 baud	None	ITA-2						Note 2
Kathmandu/VNKT	S	SAT/a	50 baud	None	ITA-2						
Muscat Seeb/OOMS	M	SAT/a	300 baud	None	ITA-2						Note 2
Nairobi/HKNC	M	SAT/a	50 baud	None	ITA-2						
Paro/VQPR	S	SAT/a	50 baud	None	ITA-2						Dial-up
CALCUTTA - S/VECC											
Dhaka/VGZR	S	RTT	50 baud	None	ITA-2	LTT	50 baud	None	ITA-2	12/00	Note 1, 2
Mumbai/VABB	S	LTT	2x75	None	ITA-2						
DELHI - S/VIDD											
Tashkent/UTTT	S	SAT/a	50 baud	None	ITA-2						
CHENNAI - S/VOMM											
Kuala Lumpur/WMKK	S	LTT	50 baud	None	ITA-2	LDD/d	300 baud	None	IA-5	12/01	Note 1, 2
INDONESIA											
JAKARTA - S/WIII											
Brisbane/YBBB	S	SAT/d	9600 bps	X.25	IA-5						Note1,2
Singapore/WSSS	S	LTT	2x50 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	Note 2
JAPAN											
TOKYO - M/RJAA											
Beijing/ZBBB	M	LDD/d	9600 bps	X.25	IA-5						
Hong Kong/VHHH	M	LDD/a	9600 bps	X.25	IA-5						
Russian Federation/UHHH	M	LTT	2400 bps	None	IA-5						(Khabarovsk) Note 2

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Russian Federation/UUUU	M	LTT	200 baud	None	IA-5	LDD/d				12/03	(Moscow)
Naha/ROAH	S	LDD/d	9600 bps	X.25	IA-5						
Seoul/RKSS	S	LDD/d	9600 bps	X.25	IA-5						Note 2
Singapore/WSSS	M	LDD/a	1200 bps	COP-B	IA-5	LDD/d	9600 bps	X.25	IA-5	12/00	
United States/KSLC	M	LDD/d	9600 bps	X.25	IA-5						
NAHA - S/ROAH											
Taibei/RCTP	S	LDD/d	4800 bps	X.25	IA-5						
Tokyo/RJAA	S	LDD/d	9600 bps	X.25	IA-5						
KIRIBATI											
TARAWA - S/NGTT											
Nadi/NFFN	S					LTT	2400 bps	None	IA-5	12/00	
LAO PDR											
VIENTIANE - S/VLVT											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Ho-Chi-Minh/VVTS	S	SAT/d	9600 bps	None	IA-5						Note 1, 2 via Hanoi
MALAYSIA											
KUALA LUMPUR-S/WMKK											
Bangkok/VTBB	S	SAT/d	2400 bps	None	IA-5			X.25		12/00	Note 1, 2
Chennai/VOMM	S	LTT	50 baud	None	ITA-2	LDD/d	300 baud	None	IA-5	12/01	Note 1, 2
Singapore/WSSS	S	SAT/d	1200 bps	X.25	IA-5						Note 2
KOTA KINABALU-S/WBKK											
Brunei/WBSB	S	LTT	50 baud	None	ITA-2	LDD/d	300 baud	COP-B	IA-5	12/00	Note 1, 2
MALDIVES											
MALE - S/VRMM											
Colombo/VCCC	S	LTT	50 baud	None	ITA-2	SAT/d	2400 bps	X.25	IA-5	12/00	Note 2
MARSHAL ISLAND											
MAJURO - S/PKMJ											
United States/KSLC	S	SAT/d	1200 bps	X.25	IA-5						
MICRONESIA FEDERATED STATE OF											
CHUUK - S/PTKK											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
KOSRAE - S/PTSA											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
PONAPEI - S/PTPN											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
YAP - S/PTYA											
United States/KSLC	S	SAT/a	1200 bps	X.25	IA-5						
MONGOLIA											
ULAANBAATAR-S/ZMUB											
Beijing/ZBBB	S	SAT/d	1200 bps	None	IA-5						Note 2
Russian Federation/UIII	M	LTT	50 baud	None	ITA-2						(Irkutsk)
MYANMAR											
YANGON - S/VYYY											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Kunming/ZPPP	S					SAT/d	300 baud	None	IA-5	12/00	Note 1,2
NAURU											
NAURU - S/ANAU											
Brisbane/YBBB	S	SAT/d	2400 bps	X.25	IA-5						
NEPAL											
KATHMANDU - S/VNKT											
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						
Mumbai/VABB	S	SAT/a	50 baud	None	ITA-2						
NEW CALEDONIA (FRANCE)											
NOUMEA - S/NWWW											
Nadi/NFFN	S	LTT	2400 bps	None	IA-5						Note 2
NEW ZEALAND											
CHRISTCHURCH-T/NZCH											
Brisbane/YBBB	T	LDD/d	2400 bps	X.25	IA-5						Note 2
Nadi/NFFN	S	LTT	2400 bps	X.25	IA-5						Note 1, 2
Niue/NIUE	S	SAT/a	300 baud	None	ITA-2						Currently by FAX
Papeete/NTAA	S	SAT/d	300 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	
Rarotonga/NCRG	S	LDD/d	2400 bps	None	IA-5						
NIUE IS											
NIUE - S/NIUE											
Christchurch/NZCH	S	SAT/a	300 baud	None	ITA-2						Currently by FAX
PAKISTAN											
KARACHI - M/OPKC											
Beijing/ZBBB	M	LTT	50 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	
Mumbai/VABB	M	SAT/a	200 baud	None	ITA-2						Note 2

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Kabul/OAKB	S					SAT/d	300 baud	COP-B	IA-5	10/00	Note 2
Kuwait/OKBK	M	SAT/a	50 baud	None	ITA-2						
PALAU											
KOROR - S/PTRO											
United States/KSLC	S	SAT/d	1200 bps	X.25	IA-5						
PAPUA NEW GUINEA											
PORT MORESBY-S/AYPM											
Brisbane/YBBB	S	SAT/d	9600 bps	X.25	IA-5						Note 2
PHILIPPINES											
MANILA - S/RPLL											
Hong Kong/VHHH	S	LTT	2x75 baud	None	ITA-2	LDD/d	300 baud	None	IA-5	12/00	Note 2
Singapore/WSSS	S	LTT	2x75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	Note 1, 2
Taibei/RCTP	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	Note 1, 2
REPUBLIC OF KOREA											
SEOUL - S/RKSS											
Beijing/ZBBB						SAT/d	9600 bps	X.25	IA-5	12/01	Note1
Tokyo/RJAA	S	LDD/d	9600 bps	X.25	IA-5						Note 2
SAMOA											
APIA - S/NSFA											
Nadi/NFFN	S	LTT	50 baud	None	ITA-2						Note 2
SINGAPORE											
SINGAPORE-M/WSSS											
Bahrain/OBBI	M	LTT	200 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	
Bangkok/VTBB	M	LDD/d	1200 bps	X.25	IA-5						Note 2
Batam/WIKB	S	LTT	50 baud	None	ITA-2						Note 2
Brisbane/YBBB	M	LDD/d	600 baud	COP-B	IA-5	LDD/d	2400 bps	X.25	IA-5	12/00	
Brunei/WBSB	S	LTT	75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	
Colombo/VCCC	M	LTT	75 baud	None	ITA-2	LDD	2400 bps	X.25	IA-5	12/00	
Ho-Chi-Minh/VVTS	S	LTT	75 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	
Jakarta/WIII	S	LTT	2x50 baud	None	ITA-2	LDD/a	2400 bps	X.25	IA-5	12/00	Note 2
Kuala Lumpur/WMKK	S	SAT/d	1200 bps	X.25	IA-5						Note 1,2
London/EGGG	M	LDD/d	1200 bps	X.25	IA-5						
Manila/RPLL	S	LTT	2x75 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	
Tokyo/RJAA	M	LDD/a	1200 bps	COP-B	IA-5	LDD/d	9600 bps	X.25	IA-5	12/00	
SOLOMON IS.											
HONIARA - S/AGGG											
Brisbane/YBBB	S	LTT	75 baud	None	IA-5						
SRI LANKA											
COLOMBO - M/VCCC											
Mumbai/VABB	M	SAT/a	50 baud	None	ITA-2	LDD/d	2400 bps	X.25	IA-5	12/00	Via PVC

State/Station	Cat.	CURRENT				PLANNED				Target date of implemen-tation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Male/VRMM	S	LTT	50 baud	None	ITA-2	SAT/d	2400 bps	X.25	IA-5	12/00	Note2
Singapore/WSSS	M	LTT	75 baud	None	ITA-2	LDD	2400 bps	X.25	IA-5	12/00	
THAILAND											
BANGKOK - M/VTBB											
Mumbai/VABB	M	SAT/a	2400 bps	X.25	IA-5						
Dhaka/VGZR	S	SAT/d	300 baud	None	IA-5						
Ho-Chi-Minh/VVTS	S	SAT/d	2400 bps	None	IA-5						Note 2
Hong Kong/VHHH	M	LDD/d	2400 bps	X.25	IA-5						
Kuala Lumpur/WMKK	S	SAT/d	2400 bps	None	IA-5			X.25		12/00	Note 1, 2
Phnom Penh/VDPP	S	SAT/d	300 baud	None	ITA-2						Note 2
Rome/LIII	M	SAT/d	2400 bps	X.25	IA-5						
Singapore/WSSS	M	LDD/d	1200 bps	X.25	IA-5						Note 2
Vientiane/VLVT	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Yangon/VYYY	S	SAT/d	300 baud	COP-B	IA-5						Note 2
TONGA											
TONGATAPU - S/NFTF											
Nadi/NFFN	S	LTT	50 baud	None	ITA-2						
TUVALU											
FUNAFUTI - S/NGFU											
Nadi/NFFN	S					LTT	50 baud	None	ITA-2	04/01	Note 2
UNITED STATES											
USA-M/KSLC											
Brisbane/YBBB	M	SAT/d	2400 bps	X.25	IA-5						
Chuuk/PTKK	S	SAT/d	1200 bps	X.25	IA-5						
Koror/PTRO	S	SAT/d	1200 bps	X.25	IA-5						
Kosrae/PTSA	S	SAT/d	1200 bps	X.25	IA-5						
Majuro/PKMJ	S	SAT/d	1200 bps	X.25	IA-5						
Nadi/NFFN	M	SAT/d	2400 bps	X.25	IA-5						
Pago Pago/NSTU	S	SAT/d	2400 bps	X.25	IA-5						
Ponapei/PTPN	S	SAT/a	1200 bps	X.25	IA-5						
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
Yap/PTYA	S	SAT/d	1200 bps	X.25	IA-5						
VANUATU											
PORT VILA - S/NVVV											
Brisbane/YBBB	S	LTT	300 baud	None	ITA-2						SITA
VIET NAM											
HO-CHI-MINH - S/VVTS											
Bangkok/VTBB	S	SAT/d	2400 bps	None	IA-5						Note 2
Hong Kong/VHHH	S	SAT/a	300 baud	None	ITA-2						Note 1, 2
Singapore/WSSS	S	LTT	75 baud	None	ITA-2	SAT/a	2400 bps	X.25	IA-5	12/00	
Vientiane/VLVT	S	SAT/d	9600 bps	None	IA-5						Note 1, 2 via Hanoi
WALLIS IS. (FRANCE)											
WALLIS - S/NLWW											
Nadi/NFFN	S					LTT	50 baud	None	ITA-2	when traffic justifies	Current routing via Noumea

TITLE AND TERMS OF REFERENCE

TITLE: ATN Transition Task Force

TERMS OF REFERENCE:

Plan for implementation of the Aeronautical Telecommunication Network (ATN) in the ASIA/PAC region to meet performance and capacity requirements of CNS/ATM Systems. The planning also addresses the ongoing development of the AFS including digital speech communication.

Subject/Tasks List of the ATN Transition Task Force

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
1	RAN/3 C 10/12 C 10/11d	Subject: ATN Transition Guidance Material Task: Develop Regional ATN Transition Guidance Material.		1) Development of detailed guidance material.	Completed
2	RAN/3 C 10/11d	Subject: ATN Transition Plan Task: Develop an ATN Transition Plan to provide seamless transition to ATN.	A	1) Develop Ground Transition Plan taking into account Air-to-Ground aspects. 2) Develop a set of planning documents covering: i)ATN Regional Routing Architecture ii)ATN Naming and Addressing Conventions, and iii) Documentation of the Assigned ATN Names and Addresses.	~~2000~~ *2001*
3		Subject: ATN major elements. Task: Provide performance and functional requirements of ATN.	A	1) Develop ATN Technical Documents. - *Security* - *Performance* - *System Management*	~~2001~~ *2002*
4	RAN/3 C 10/11b	Subject: AFTN related issues Task: Review operation of AFTN.	B	1) Evaluate and review the effect of increases or decreases in capacity and network changes, on circuit loading. 2) Plan network changes for support of OPMET and AIS databases, automated VOLMET broadcast.	On going 2003
5		Subject: Planning and implementation information in ANP. Task: Develop G/G part of the CNS FASID.	A	1) Development of detail description for the existing tables and Charts for the G/G part of the CNS FASID.	*2001*

Amendments to the Regional Plan for the new CNS/ATM Systems

CHAPTER 5. CURRENT STATUS AND REGIONAL STRATEGY – CNS/ATM SYSTEMS

5.1 General

5.1.1 A comprehensive assessment and analysis of the characteristics and the capabilities of the present system and of their implementation in various parts of the world ascertained that the shortcomings of the present CNS systems amounts to essentially three factors:

a) the propagation limitations of current line-of-sight systems and/or accuracy and reliability limitations imposed by the variability of propagation characteristics of other systems;

b) the difficulty, caused by a variety of reasons, to implement present CNS systems and operate them in a consistent manner in large parts of the world; and

c) the limitations of voice communications and the lack of digital air-ground data interchange systems in the air and on the ground.

5.1.2 The limitations summarized in 5.1.1 are intrinsic to the systems themselves. Although their effects are not the same for every part of the world, it is evident that one or more of these factors inhibits the further development of air navigation almost everywhere. New CNS systems should surmount these limitations to allow ATM on a global scale to evolve and become more responsive to users' needs.

5.1.3 The present ground communications system, the Aeronautical Fixed Telecommunications Network (AFTN) is limited in throughput, data integrity, and the ability to handle bit oriented message and data exchanges. The evolution of the communications path to full Aeronautical Telecommunication Network (ATN) capability is seen as evolving by deploying ATN ground-ground routers. The ATN ground-ground router capability will be used to provide the establishment of ATN routing domains. By implementing AFTN/~~ATN~~ AMHS gateways over the ATN(bit-oriented) networks interconnected by ATN ground-ground routers, ground communications system resolves the shortcomings of AFTN, and will finally evolve in AMHS. Some ground ATN networks are used for the ground portion of Air-Ground data interchange by deploying ATN Air-Ground router situated at the ground end of Air-Ground data link, connected to ground network and exclusively used for Air-Ground data interchanges.

5.2 Communications

5.2.1 The ATN will provide for the interchange of digital data between End Systems (Airborne system, ground system) over dissimilar air-ground and ground-ground communication links. The users of End Systems include aircrew, air traffic controllers, aircraft operators, etc. The ATN, which is based on the International Organization for Standardization (ISO) open systems interconnection (OSI) reference model, will provide the internetworking of aeronautical "subnetworks" in OSI terminology. User access to the ATN is via one or more subnetworks which are connected by ATN routers. ATN routers may be either mobile (aircraft) or fixed (ground-based). The ATN router selects a path via aeronautical subnetworks based on

user-specified communication parameters and subnetwork availability. This action is transparent to the End Systems user who, therefore, does not need to know the area of coverage of particular subnetworks nor to change communications procedures depending upon the subnetworks that are in use.

5.2.2 An opportunity offered to enable early use of current technology by the application of ARINC Specification 622 over character-based data communication systems such as Aircraft Communications Addressing and Reporting System (ACARS), will provide for significant benefits in ATM. Several States are proceeding with implementation of ATS ground facilities to meet and take early advantage of aircraft CNS packages, both of which are based on the ARINC Specification 622. The implementation plans recognize that eventual transition to the ATN is an objective and that ARINC Specification 622 is an intermediate interim step designed to gain early CNS/ATM benefits from existing technology.

5.3 Navigation

5.3.1 Area Navigation (RNAV) capability will be progressively introduced in compliance with the ICAO Required Navigation Performance (RNP) Standards. The Global Navigation Satellite System (GNSS) will provide navigation coverage over the whole Asia/Pacific Region . Microwave landing system (MLS) instrument landing system (ILS) and the GNSS will be used for approach and landing in accordance with the ICAO strategy. Current navigation aids (NDB/VOR/DME) will be progressively withdrawn.

5.3.2 Modern aircraft are increasingly being equipped to utilize newer techniques, generally referred to as RNAV, the use of which is appropriate and inevitable because they facilitate a flexible route system. Therefore, the future navigation system is based on the availability of airborne RNAV capability. A new concept, called RNP, has been developed for this future navigation system. RNP is broadly defined as the maximum deviation from assigned track within which the aircraft can be expected to remain with a given degree of probability. This concept avoids the need for ICAO selection between competing systems from the outset; however, it will not prevent ICAO from dealing with navigation techniques which are in wide use internationally.

5.3.3 GNSS systems providing independent navigation, where the user performs on-board position determination from information received from broadcast transmissions by a number of satellites, are providing highly reliable, highly accurate and high integrity global coverage independently. Although the RNP concept allows for more than one satellite navigation system to be in use simultaneously, from an aircraft equipment point of view, maximum interoperability is essential as it would significantly simplify avionics and thereby reduce cost. It would also be attractive if systems could serve as complementary to and/or in a back-up role for each other.

5.4 Surveillance

5.4.1 Automatic Dependent Surveillance (ADS) is becoming available over the oceanic and continental airspaces of the Asia and Pacific Regions. SSR (augmented as necessary with Mode S) will continue to be used in terminal areas and in some high density airspaces. The use of primary radar will diminish.

5.4.2 The introduction of air-ground data links, together with sufficiently accurate and reliable aircraft navigation systems, present the opportunity to provide surveillance services

in areas which lack such services in the present infrastructure, in particular oceanic areas and other areas where the current systems prove difficult, uneconomic, or even impossible, to implement. ADS is a function for use by ATS in which aircraft automatically transmit, via a data link, data derived from on-board navigation systems. As a minimum, the data should include the four-dimensional position. Additional data may be provided as appropriate. The ADS data would be used by the automated ATC system to present information to the controller. In addition to areas which are at present devoid of traffic position information other than pilot provided position reports, ADS will find beneficial application in other areas, including high-density areas, where ADS may serve as an adjunct and/or back-up for secondary surveillance radar and thereby reduce the need for primary radar. Also, in some circumstances, it may even substitute for secondary radar. As with current surveillance systems, the full benefit of ADS requires supporting complementary two-way pilot-controller data and/or voice communication (voice for at least emergency and non-routine communication).

5.5 CNS System Evolution

5.5.1 The new CNS concept is very flexible in that each State has the choice of implementing specific system elements to meet its individual requirement for forming a complete, operable CNS/ATM system. Thus, the communication elements can be implemented using any or all or any combination of satellite, VHF or SSR Mode S. States with high traffic density airspaces would probably use all of these, but small States with continental airspace could only implement the CNS/ATM concept by communications and ADS on VHF alone.

Amendments to the Regional Plan for the new CNS/ATM Systems

CHAPTER 7. COMMUNICATIONS

7.1 Flexibility

7.1 The new CNS concept is very flexible in that each State has the choice of implementing specific system elements to meet its individual requirement for forming a complete, operable CNS/ATM system. Thus, the communication elements can be implemented using any or all or any combination of satellite, VHF or SSR Mode S. States with busy airspaces would probably use all of these, but small States with continental airspace only could implement the new CNS/ATM concept by communications and ADS on VHF alone.

7.2 Communications Services Envisaged

7.2.1 Aeronautical communications include:

a) safety communications requiring high integrity and rapid response:

1) safety-related communications carried out by ATS for ATC, flight information and alerting;

2) aeronautical operational control (AOC) communications carried out by aircraft operators, which also affect air transport safety, regularity and efficiency (aeronautical operational control); and

b) non-safety related communications:

1) private correspondence of aircraft operators (aeronautical administrative communications (AAC)); and

2) public correspondence (aeronautical passenger communications (APC)).

7.3 Continued Requirement for Terrestrial Air/Ground Communication

7.3.1 Terrestrial communications will continue to be required. Their inherent short transmission delays are better suited where the rapid exchange, short transactions style of voice communication is required. While there will be a trend to move towards more data link communications for many functions, it is anticipated that voice communication is expected to be needed for a long time in the future.

7.3.2 While not an operational factor, the potential lower cost of a terrestrial service over a satellite service is a significant factor in the continued use of terrestrial facilities where they can be made available.

7.4 Aeronautical Telecommunications Network (ATN)

7.4.1 The ATN will provide for the interchange of digital data between a wide variety of end system applications supporting end users, such as; aircraft operators, air traffic controllers, and aeronautical information specialists. The ATN, based on the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference model, allows for the inter-operation of dissimilar air-ground and ground-to-ground subnetworks as a single internet environment. End systems attach to ATN subnetworks and communicate with end systems on other subnetworks, by using ATN routers. ATN routers can be either mobile (aircraft based) or

fixed (ground based). The ATN routers select the logical path across a set of ATN subnetworks that can exist between any two end systems. This path selection process uses the network level addressing, quality of service and security parameters provided by the initiating end system. Thus the initiating end system does not need to know the particular topology, or availability of, specific subnetworks. The ATN architecture is shown in Figure 7-1

7.4.2 In support of a multi-national and multi organisational environment, the ATN will provide a network management framework which will allow routers to operate on a largely autonomous basis. In this context, routers will be capable of performing routing management tasks based on operational, policy and security considerations contained within local management databases.

7.4.3 In summary, the ATN is designed to transfer data between end-users independent of protocols and addressing schemes internal to any one participating subnetwork. In order to meet this objective, all participating subnetworks must be interconnected via internetwork routers observing common internetworking conventions and standards. This strategy will provide network-independent interface for all ATN users.

7.4.4 The ATNP Working Groups, in terms of the their work programme, has proposed the following information for consideration by the various committies of APANPIRG/CNS/ATM/IC/SG. The contingent requirements for final development of SARPs and Guidance Materials for auguementation of CNS/ATM capabilities may be expresed in the following areas of interest:

a) Address assignment mechanism for ATN compliant End Systems as well as intermediate systems(i.e. routers).

b) End-to-end communication protocols

i) Ground-ground communication applications (e.g. AMHS, AIDC)
ii) Air-ground communication applications (e.g. ADS, CPDLC, FIS)
iii) Internet Protocol among airborne subnetwork, air-ground data links as well as various ground-ground subnetworks.
iv) Air Traffic Management Flow Control (ATM)

The ATNP has established CCB(Configuration Control Board) that will facilitates document control in the ICAO publishing process.

7.5 Transition Guidelines

7.5.1 Guidelines for transition to the future communications systems should be such as to encourage early equipage by users through the earliest possible accrual of the systems benefits. Although a transition period during which dual equipage, both airborne and ground, will be necessary in order to ensure the reliability and availability of the new systems, the guidelines should be aimed at minimizing this period to the extent practicable.

7.5.2 The following guidelines are applicable to the new communication systems:

- States should begin to use data systems as soon as possible after they become available

Early use of existing character oriented data systems will provide important experience to guide further development and implementation of new data communications systems. In addition, the benefits of data link systems will become more apparent with early use.

- Transition to AMSS should initially be in oceanic airspace and in continental en-route airspace with low-density traffic

In oceanic and some remote continental areas, air-ground communication is presently unavailable or non-existent, and AMSS could provide a significant early benefit. In some oceanic areas, traffic levels are high; HF communication link congestion frequently occurs. For these areas, early introduction of AMSS for position reporting and two-way ATC communications could relieve HF communication system congestion.

- States and/or Regions should co-ordinate to ensure that where ATC applications supported by AMSS are to be introduced, they should be introduced approximately simultaneously in adjacent flight information regions (FIRs) through which there are major traffic flows

This will provide seamless transition through FIR boundaries.

- During the transition period after AMSS is introduced, the current levels of integrity, reliability and availability of existing HF communications systems must be maintained

HF communications will provide back-up to AMSS and will accommodate non-AMSS equipped airspace users. In addition, prospects for eventual use of AMSS should not deter States from meeting near-term ATC communication needs with new or enhanced HF communication services. In cases where HF communication services are to be withdrawn and replaced by AMSS, HF services should be phased out gradually.

- Data Communication connectivity between ATC facilities within a State and ATC facilities in adjacent States should be established, if they do not already exist

Data communications connectivity between ATC facilities will be required to support automated procedures and/or increased traffic volumes associated with ATM system improvements. Ground-to-ground ATN connectivity will be required to replace the AFTN when full automation, or bit oriented applications, are implemented.

- ATN should be implemented in phases

~~Existing air-ground data communication links and associated ground based message processors should be used initially, where possible.~~ For ground-ground data communications, two levels of ATN Transition have to be identified; one is the interoperable ground internetworking based on

ATN Internet SARPs, and the other is ground-ground communication services(e.g.AMHS, AIDC) over ATN internetworking. The ground internetworking is used for air-ground communication services, e.g. ADS, CPDLC, FIS, as well as ground-ground communication services. The first phase of the ATN is achieved by upgrading the ground internetworking capability ~~by implementing X.25 protocol, and~~ by deploying critical elements of the ATN, such as ATN ground-ground routers, and by providing ground-ground messaging service by deploying critical transition elements such as AFTN/~~ATN~~ AMHS gateways, targeting to migrate to AMHS as defined in ATN AMHS SARPs. The deployment and validation of the gateway and ATN ground routers is needed. The second phase of the ATN is achieved by implementing the air-ground ATN routers and associated SARPs compliant protocols, which also requires validation as well as by implementing air-ground data communication services(e.g. ADS, CPDLC, FIS) over ATN internetworking.

- New ATM systems should support bit-oriented applications for communications with applications located in aircraft (A/G) or applications located in other ground systems (G/G)

To faciltate interoperability, these new systems are required to be compatible with the ATN internet and upper layer protocol architectures. During the transition period it will be necessary to provide for the encoding of applications data into character based message formats for exchange over character oriented networks.

7.5.3 The transition to ATN is expected to start before the institutional issues involved in the administration of ATN have been fully agreed. ~~The initial ATN routers should be procured by some States as COTS products, and upgraded as newer versions of the software are available to implement all of the necessary ATN options and parameters. Where ground-to-ground ATN is not available to support trials and demonstrations, such as the ATS Interfacility Data Communications (AIDC) application, the existing AFTN should be used to exchange message/data units between those ATM systems.~~ The transition from AFTN circuits to ATN internetworking will be on a ~~circuit by circuit~~ inter-domain connection basis, with time scales that ~~can~~ shall be ~~quite independent of the other~~ prior to any deployments of elements of the new CNS/ATM systems. In order to migrate to ATN internetworking, there shall be clear identification of the domains to be interconnected. Furthermore, to establish a domain, States shall establish networks within their own domain to support inter-domain agreements. The determining factor will be the requirements placed on ATN communication services provided over the interconnected networks. Some AFTN circuits may be ~~fully~~ converted to ATN Internetworking well before any ~~sole system~~ use of ATN communication services occurs in ~~air-ground systems of~~ the new CNS/ATM systems.~~,~~ Where other AFTN circuits may meet the service requirement by the continued use of AFTN well into the future, there will be a need to provide a gateway to communicate between the ATN and AFTN environments.

STRATEGY FOR THE PROVISION OF PRECISION APPROACH AND LANDING GUIDANCE SYSTEMS

Considering:

a) that, in the ASIA/PAC Region, ILS is capable of meeting the majority of requirements for precision approach and landing;

b) that, requirements for terrestrial based provision of non-precision and precision approach and landing navigation facilities has been implemented in most cases;

c) that, the availability of a proven and standardized MLS to meet all weather operations requirements;

d) the projected availability of ICAO GNSS SARPs and guidance material;

e) feasibility of GBAS systems to support category II and III operations in 2005;

f) the development and deployment of multimode receivers;

g) the definition of Required Navigation Performance for approach, landing and departure operations;

h) the knowledge that GNSS without augmentation can support non-precision approaches and the augmented GNSS based systems will be available to support Category I operations from the year 2002;

i) the need to maintain aircraft interoperability both within the region and between the ASIA/PAC region and other ICAO regions and to provide flexibility for future capability.

The revised strategy for ASIA/PAC Region in the provision of precision approach and landing guidance is:

a) ILS be retained as an ICAO standard system for as long as it is operationally acceptable and economically beneficial;

b) Implement MLS where operationally required and economically beneficial;

c) Implement GNSS, with such ground based local or regional augmentation to support Category I operations where appropriate;

d) Conduct studies for the implementation of GNSS local ground based augmentation systems and GNSS avionics equipment for Category II and III operations;

e) Implement the Required Navigation Performance (RNP) for approach, landing and departure operations in accordance with ICAO provisions when and where applicable;

f) Conduct necessary on-going education and training for operational personnel in using GNSS to ensure safe operations.

**STRATEGY FOR THE IMPLEMENTATION OF
GNSS NAVIGATION CAPABILITY IN THE ASIA/PACIFIC REGION**

Considering that:

1) Safety is the highest priority;

2) Elements of Global Air Navigation Plan for CNS/ATM system on GNSS and requirements for the GNSS implementation have been incorporated into the CNS part of FASID;

3) GNSS Standards and Recommended Practices (SARPs), PANS and guidance material for GNSS implementation are available;

4) The availability of avionics including limitations of some receiver designs; the ability of aircraft to achieve RNP requirements and the level of user equipage;

5) Development of GNSS systems including satellite constellations and improvement in accuracy such as discontinuing GPS Selective Availability;

6) Airworthiness and operational approvals allowing the current GNSS to be applied for en-route and non precision approach phases of flight without the need for augmentation services external to the aircraft;

7) Development status of aircraft based augmentation system and regional augmentation systems include both satellite-based and ground-based systems;

8) Human, environmental and economic factors will affect the implementation of GNSS.

The general strategy for the implementation of GNSS in the Asia/Pacific Region is detailed below. This strategy is based on the regional navigation requirements of :

(a) RNP10 for en-route in remote/oceanic areas;
(b) RNP4 for en-route and terminal phases of flight;
(c) NPA/APV for approaches and departures; and
(d) Precision approaches at selected airports.

1) There should be an examination of the extent to which the GNSS system accessible in the Region can meet the navigational requirements of ATM service providers and aircraft operators in the Region;

2) Evolutionary introduction of GNSS Navigation Capability should be consistent with the Global Plan Air Navigation Plan for CNS/ATM System;

3) Implementation shall be in full compliance with ICAO Standards and Recommended Practices and PANS;

4) Introduce the use of GNSS as primary means of navigation in remote/oceanic areas without conventional terrestrial based navigational aids;

5) Introduce the use of GNSS as a supplementary means of en-route navigation and non-precision approach;

6) Any external augmentation system deemed necessary for the implementation of GNSS for a particular flight phase in an area under consideration (SBAS/GBAS including ground based regional augmentation system) should be implemented in full compliance with ICAO SARPs;

7) To the extent possible, States should work co-operatively on a multinational basis to implement GNSS augmentation systems in order to facilitate seamless and inter-operable systems;

8) States consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance with the exception of State aircraft;

9) States undertake a co-ordinated R & D programme on GNSS implementation and operation;

10) ICAO and States should undertake education and training to provide necessary knowledge in GNSS theory and operational application, and

11) States establish multidisciplinary GNSS implementation teams, using section 6.10.2 of ICAO Circular 267, Guidelines for the Introduction and Operational Approval of the GNSS , as a guide.

IMPLEMENTATION OF THE ISCS/2 AND SADIS IN THE ASIA/PAC REGIONS

International Satellite Communication System (ISCS/2)

State/Territory	WAFS User	Location of VSAT	Access Approved	Equipment Installed	Equipment Operational
American Samoa (United States)		Information received from the US NWS, Honolulu via a dedicated circuit			
Australia	Bureau of Meteorology	Melbourne	X	X	X
China	China Meteorological Administration (CMA) Civil Aviation Administration Civil Aviation Administration Hong Kong Observatory Chinese Aeronautical Meteorology Association	National MET Centre, Beijing Beijing Intl. Airport Shanghai Intl. Airport Hong Kong Intl. Airport Taibei	X X X X X	 X X X	 X X X
Cook I	Meteorological Service				
Fiji	Meteorological Service	Nadi Intl. Airport	X	being installed	
French Polynesia (France)	Meteo France	Information received from France via satellite	X		
Guam (United States)			X		
Indonesia	Meteorological and Geophisical Agency	Soekarno - Hatta International Airport	X	X	X
Japan	Japan Meteorological Agency	Kokusai Denshin Denwa Co.,	X	X	X
Kiribati					
Mongolia	Civil Aviation Authority	Ulaanbaatar	X		
Nauru					
New Caledonia (France)	Meteo France		X	X	X
New Zealand	MET Service of New Zealand, Ltd	Auckland Wellington	X X	back up only X	 X

International Satellite Communication System (ISCS/2)

State/Territory	WAFS User	Location of VSAT	Access Approved	Equipment Installed	Equipment Operational
Niue					
Papua New Guinea	Meteorological Department	Port Moresby Intl. Airport	X		
Philippines	Department of Meteorology	Manila	X		
Republic of Korea	Meteorological Services	Seoul Intl. Airport	X	X	X
Samoa					
Singapore	Singapore MET Service	Singapore/Changi Intl. Airport	X	X	X
Thailand	Meteorological Department	Bangkok Intl. Airport	X		
Tonga					
Tuvalu					
Vanuatu	Meteorological Service	Port Vila	X		
Viet Nam	Meteorological Service	Hanoi City	X	X	X
United States	National Weather Service	Guam Hawaii	X X	X	X
Wallis I. (France)	Meteo France	Wallis	X	X	X

Satellite Distribution System (SADIS)					
State/Territory	**WAFS User**	**Location of VSAT**	**Access Approved**	**Equipment Installed**	**Equipment Operational**
Australia	Bureau of Meteorology	Perth	X	X	
Bangladesh	Department of Meteorology	Dhaka	X	X	X
Brunei	Department of Civil Aviation	Brunei Intl. Airport	X	X	X
China	China Meteorological Administration (CMA)	National MET Centre, Beijing	X		
	Civil Aviation Administration	Beijing Intl. Airport	X	X	X
	Civil Aviation Administration	Guangzhou Intl. Airport	X	X	X
	Hong Kong Observatory	Hong Kong Observatory	X	X	X
	Chinese Aeronautical Meteorology Association	Taibei	X		
	Civil Aviation Administration	Macau Intl. Airport	X	X	X
DPR of Korea	General Administration of Civil Aviation	Pyongyang Intl. Airport	X	X	X
India	Meteorological Department	New Delhi	X	X	X
Indonesia	Meteorological and Geophysical Agency	Headquarters	X	X	
Lao PDR	Department of Meteorology	Vientiane, Wattay	X	X	
Malaysia	Department of Meteorology	Kuala Lumpur Intl. Airport	X	X	X
Maldives	Department of Meteorology	Male Intl. Airport	X	X	X
Mongolia	Civil Aviation Authority	Ulaanbaatar Intl. Airport	X	X	X
Nepal	Department of Meteorology	Kathmandu Intl. Airport	X	X	X
Singapore	Meteorological Service	Singapore/Changi Intl. Airport	X	X	X
Sri Lanka	Department of Meteorology	Colombo	X	X	X
Thailand	Thai Meteorological Department	Bangkok Intl. Airport	X	X	X
Vietnam	Civil Aviation Administration	Gialam Airport, Hanoi	X	X	X
	Civil Aviation Administration	Tan-Son-Nhat Intl. Airport, Ho Chi Minh	X	X	

STATUS OF EMWIN INSTALLATION

State	Location
American Samoa	1 NWS
Cook Islands	1 NWS
Fiji	1 NWS
French Polynesia	1 NWS
FSM	1 NWS
Hawaii	Systems in used by NWS HQ and F/Cast Offices
Kiribati	1 NWS
New Zealand	1 NWS HQ.
Nauru	1 ARM ARCS station
New Caledonia	1 NWS
Niue	1 NWS
Samoa	1NWS
Solomon Islands	1 NWS
Tokelau	1 NWS
Tonga	1 NWS
Tuvalu	1 NWS
Vanuatu	1 NWS
Wallis and Futuna	1 NWS

It is intended to install additional systems in PNG, Guam and other locations further west when GOES 7 re-transmission commences.

SADIS STRATEGIC ASSESSMENT TABLES
CURRENT AND PROJECTED OPMET DATA VOLUMES 2000-2004

TABLE 1

ICAO REGION: ASIA
MAIN ROUTING(S): AFTN, Two-Way, Direct Line (GTS)

(E.G CAPSIN AND AFTN/GTS/SADIS TWO-WAY)

	CURRENT 2000	**Projected 2001**	**Projected 2002**	**Projected 2003**	**Projected 2004**
ALPHNUMERIC OPMET DATA					
Number of **FC bulletins** issued per day	33	35	40	40	40
Average number of stations per FC bulletin	6	6	6	6	6
Number of **FT bulletins** issued per day**	205	275	300	300	300
Average number of stations per FT bulletin	6	6	6	6	6
Number of **SA bulletins** issued per day	726	900	950	1000	1050
Average number of stations per SA bulletin	6	6	6	6	6
Number of **SP bulletins** issued per day	0	10	25	50	50
Number of **SIGMET bulletins** issued per day	24	75	100	125	125
(WS<WV and WC) for relevant FIRS					
OTHER OPMET DATA					
Number of other bulletins issued per day					
(please specify header(s))					
Average number of stations per bulletin					
TOTALS					
Total number of OPMET bulletins per day	**995**	**1295**	**1415**	**1515**	**1565**
Average size of OPMET bulletin (bytes)	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**
TOTAL ESTIMATED OPMET DATA VOLUME PER DAY (BYTES)	**348K**	**453K**	**495K**	**530K**	**548K**

CURRENT AND PROJECTED T4 FACSIMILE CHART VOLUMES 2000-2004

TABLE 2

ICAO REGION: ASIA
MAIN ROUTING(S): GTS

(E.G CAPSIN AND AFTN/GTS/SADIS TWO-WAY)

T4 FACSIMILE CHART INVENTORY	CURRENT 2000	Projected 2001	Projected 2002	Projected 2003	Projected 2004
Head number/Chart name					
Time of issue of chart (UTC)	No requirement	No Requirement	No Requirement	No Requirement	No Requirement
Average size of chart (bytes)					
Chart type (e.g. wind/temp/SIGWX)					
Chart level (FL range or medium/high level)					
Validity time of chart VT (UTC)					
High number/Chart name					
Time of issue of chart (UTC)					
Average size of chart (bytes)					
Chart ape (e.g. wind/temp/SIGWX)					
Chart level (FL range or medium/high level)					
Validity time of chart VT (UTC)					
TOTALS					
Total number of T4 charts issued per day					
Average size of each chart (bytes)					
TOTAL ESTIMATED T4 CHART DATA VOLUME PER DAY (BYTES)					

(Levels : medium FL 100-240, high FL250-630)
(*1 octet = 8 byte = 1 character)

CURRENT AND PROJECTED BUFR DATA VOLUMES 2000-2004

ICAO REGION: ASIA **TABLE 3**
MAIN ROUTING(S): Two-Way, GTS

(E.G CAPSIN AND AFTN/GTS/SADIS TWO-WAY)

BUFR SIGWX MESSAGES	CURRENT 2000	Projected 2001	Projected 2002	Projected 2003	Projected 2004
WMO Header			One site	+2 other sites	+2 other site
Time(s) of issue of data (UTC)	No Requirement	No Requirement	No Requirement	0700, 1300, 1900, 0100	0700, 1300, 1900, 0100
Average size of message (bytes)			15K	15K	15K
Data level (e.g. FL range or low/medium/high level)			SWL/SWM*	SWL/SWM*	SWL/SWM*
Validity time(s) of data VT (UTC)			1200, 1800, 000, 0600	1200, 1800, 0000, 0600	1200, 1800, 0000, 0600
WMO Header					
Time(s) of issue of data (UTC)			0700, 1300, 1900, 0100	0700, 1300, 1900, 0100	0700, 1300, 1900, 0100
Average size of message (bytes)			15K	15K	15K
Data level (e.g. FL range or low/medium/high level)			SWL/SWM*	SWL/SWM*	SWL/SWM*
Validity time(s) of data VT (UTC)			1200, 1800, 000, 0600	1200, 1800, 0000, 0600	1200, 1800, 0000, 0600
WMO Header					
Time(s) of issue of data (UTC)			0700, 1300, 1900, 0100	0700, 1300, 1900, 0100	0700, 1300, 1900, 0100
Average size of message (bytes)			15K	15K	15K
Data level (e.g. FL range or low/medium/high level)			SWL/SWM*	SWL/SWM*	SWL/SWM*
Validity time(s) of data VT (UTC)			1200, 1800, 000, 0600	1200, 1800, 0000, 0600	
TOTALS					
Total number of BUFR messages per day			**12**	**36**	**60**
Average size of messages (bytes*)			**15K**	**15K**	**15K**
TOTAL ESTIMATED VOLUME OF BUFR MESSAGES PER DAY (BYTES)			**180K**	**540K**	**900K**

(* 1 octet = 8 byte = 1 character) (low level<100, medium level : FL100-240, high level. FL 250-630)

CURRENT AND PROJECTED AIS DATA VOLUMES 2000-2004
(Subject to statement of an operational requirement)

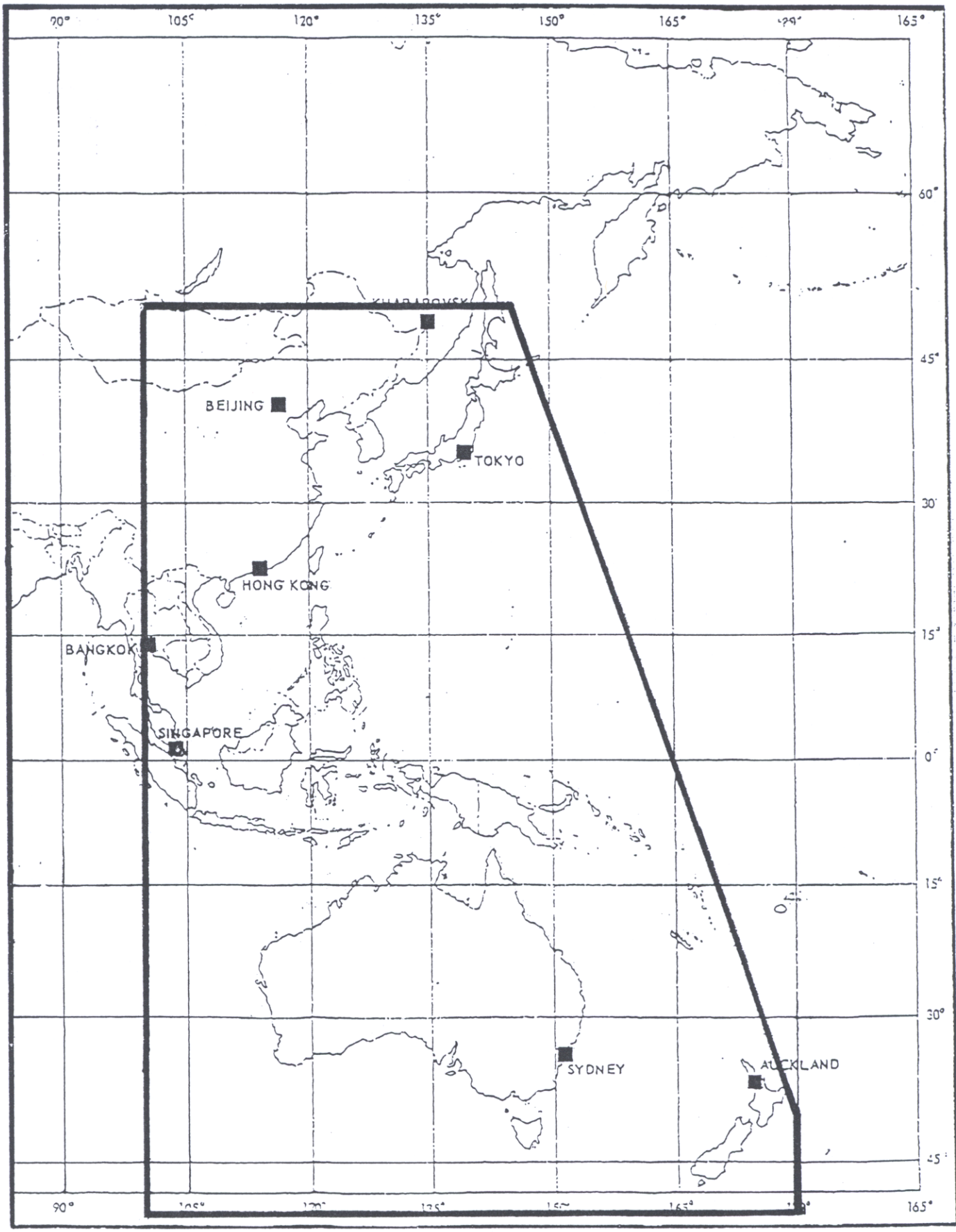
ICAO REGION: ASIA **TABLE 4**
MAIN ROUTING(S): Two-Way, AFTN

(E.G CAPSIN AND AFTN/GTS/SADIS TWO-WAY)

AIS (Subject to statement of an operational requirement)	**CURRENT 2000**	**Projected 2001**	**Projected 2002**	**Projected 2003**	**Projected 2004**
ALPHANUMERIC AIS DATA (e.g. NOTAMs)		**From Two-Way site**			
Bulletin type :	No requirement	No requirement	No requirement	No requirement	No requirement
Number of bulletins issued per day					
Average size of each bulletin (byte*)					
Bulletin type :					
Number of bulletins issued per day					
Average size of each bulletin (byte*)					
CHART AIS DATA (e.g. AIP CHARTS)					
Header number/Chart type (e.g. AIP)					
Time(S) of issue of chart (UTC)					
Average size of chart (bytes*)					
Validity time of chart VT (UTC)					
Header number/Chart type (e.g. AIP)					
Time(S) of issue of chart (UTC)					
Average size of chart (bytes*)					
Validity time of chart VT (UTC)					
TOTALS					
Total number of AIS bulletins per day					
Average size of AIS bulletin (bytes)					
Total number of AIS charts issued per day					
Average size of AIS chart (bytes)					
TOTAL ESTIMATED VOLUME OF AIS DATA PER DAY (bytes)					

(*1 octet = 8 byte = 1 character)

Proposed Coverage of Additional SWM Chart(s) for ASIA/PAC



Draft

~~ICAO~~

ASIA/PAC WAFS Transition Plan and Procedures

3rd Edition - July 2000

~~Revision 2a - 2 June 2000~~

ASIA/PAC WAFS Transition Plan and Procedures

~~Revision 2a - 2 June 2000~~ 3rd Edition - July 2000
~~(doc: transplanrev2aJune2000.wpd)~~

Introduction

1. The ICAO Asia/Pacific WAFS Transition ~~Task Force has revised the transition plan and procedures~~ Plan and Procedures has been revised to take account of ~~(i)~~ progress already made~~, (ii) to acknowledge that some States in the Asia/Pacific Region will not be in a position to install VSAT equipment for reception of WAFS products,~~ and ~~(iii)~~ in recognition of the impact of the final phase of WAFS.

The Final Phase of WAFS

2. This plan is based on the understanding that the Final Phase of WAFS, as it will apply to the Asia/Pacific Region, involves:

a. Production and dissemination by the WAFCs of global forecast winds, temperatures and humidity in GRIB format. The wind and temperature forecasts are now operational. **Note**: Humidity and forecast information for FL140 is expected to be introduced in November 2001 in response to user requirements, especially for ETOPS operations.

~~b. The production and distribution by the two WAFCs of all the SWH charts (in T4 facsimile format) required within the Asia/Pacific Region.~~

~~c~~.b The transfer of responsibility for the production for SWH from RAFCs to the two WAFCs, and hence the closing down of the RAFCs. ~~To be achieved in 2000.~~

~~d.~~c The implementation of a communication system/s for the distribution of WAFS products in the Asia/Pacific Region, to all the States that require the products in support of international air navigation. The final phase envisages this will be achieved via satellite broadcast (SADIS and ISCS/2). ~~For s~~Some ~~of the smaller s~~States may need to use an alternative distribution system. ~~may be required~~

~~e. The possible production, in T4 facsimile format by one or both WAFCs of a SWM chart covering a limited area or areas, to meet Asia/Pacific Regional requirements.~~

~~f.~~d The production and distribution (via satellite broadcast) by the WAFCs, of Global, quality controlled SWH (FL 250 - 630) in BUFR format, and Global SWM in BUFR format (in raw form, i.e. not quality controlled)

~~g.~~e The capability of States to convert ~~the SWH and SWM from BUFR to T4 facsimile type format for distribution to the aviation industry to meet local requirements~~BUFR and GRIB messages to graphical products on an operational basis.

SIGWX Charts

3. The transfer of responsibilities for the production of high level SIGWX forecasts from the RAFCs to the WAFCs is the decision of the ICAO Regional Planning groups. As the quality and accuracy of the SIGWX forecasts are evaluated as acceptable for flight planning purposes, coordination is taking place for the transition of the Asia/Pacific RAFC responsibilities for SIGWX charts to the two WAFCs. ~~The procedures for the transfer of responsibility involve the steps specified in Attachment 1 - "Procedures for the Transfer of Responsibility of RAFC Operations in the Asia Pacific Regions to the Two WAFCs".~~

4. The sequence of events to transfer SWH responsibility from the RAFCs Melbourne, Tokyo and Wellington to the WAFC Washington and London as appropriate, and high/medium level SIGWX charts from the RAFC New Delhi to the WAFC London is shown below. The table below shows the ~~dates when the WAFC charts are expected to be operational~~ status of the introduction of SIGWX charts.

Chart area & responsible WAFC	**~~Target date when chart considered operational by the WAFC~~ Status**
G London (SWH)	Operational
K London (SWH)	Operational
D London (SWH)	Operational
Asia South medium & high	Operational
J Washington (SWH)	Operational
E London (SWH)	Operational
F Washington (SWH)	~~June 2000~~ Operational
I Washington (SWH)	Operational

~~Table 1 - Time-table for the introduction of SIGWX charts in the Asia/Pacific Region~~

5. There will be an ongoing requirement for NMSs to monitor the quality of WAFC produced SIGWX charts, at least until the Final Phase of WAFS, that is beyond the date of transfer of responsibility for SIGWX.

6. Action required to be taken by States to adhere to the provision of Annex 3~~The Task Force will liaise with the COM Sub-Group~~ to ensure the relevant advisories for tropical cyclones, volcanic ash, the release of radio active material and SIGMETS are made available to the WAFCs in a timely manner. ~~The Task Force stresses there will be an ongoing requirement for states who operate Tropical Cyclone Advisory Centres (TCAC) and Volcanic Ash Advisory Centres (VAAC), to monitor SIGWX forecasts that cover their area of responsibility, to ensure the accurate inclusion of tropical cyclone and or volcanic ash symbols.~~

7. The table below shows the dates when SIGWX charts were considered operational by the ~~WAFCs~~ Region ~~The table below shows the chart areas that need to be operational, before the RAFCs in the Asia/Pacific Region are in a position to transfer responsibility for production of SIGWX forecasts to their~~

~~respective WAFCs. In doing so procedures specified below are to be followed~~:

RAFC	~~Areas that need to be operational before transfer of responsibility can take place and the target date~~	
	Chart area	**Date when SIGWX chart considered operational**
New Delhi	D and Asia South	~~Operational~~ July 1999
Tokyo	I, E and G	February 2000
Wellington	J and F	April 2000
Melbourne	E, ~~and~~ F and K	July 2000

~~**Table 2 - Transfer of RAFC responsibility by areas of coverage**~~

8. The SIGWX charts produced by WAFC Washington are also available on the US NWS Aviation Weather Center Internet site at:

http://www.awc-kc.noaa.gov/awc/hilvl.html

9. ~~RAFCs Melbourne, New Delhi, Tokyo and Wellington~~ States are encouraged to send comments to the WAFCs about the quality and accuracy of SIGWX on a frequent and regular basis during the transition period to the Final Phase. ~~States within an RAFC service area wishing to comment are requested to submit their comments through their respective RAFC for forwarding to the WAFCs. Comments for WAFC Washington should be sent to~~ Contact details for comments are:

i. NWS/Aviation Weather Centre
Attention Mr Ronald Olson
7220 NW 101st Terrace
Kansas City, Missouri
USA 64153-2371

ii E-mail addressed to: ronald.olson@noaa.gov

iii Fax number: 1 816 880 0650

i. The Met. Office
Attention : Mr. Neil Halsey

Aviation Branch
Sutton House
London Road Bracknell
Berkshire RG12 2SY, United Kingdom

ii E-mail addressed to: nhalsey@meto.gov.uk

iii Fax number: +44 (1344) 854 156

~~10. It should be noted that following transfer to the two WAFCs, comments from States may be sent directly to the two WAFCs.~~

~~11. Evaluation comments relating to the WAFC London SIGWX charts are to be sent to the UK Met Office, marked attention Mr Neil Halsey, Fax number: 44 1344 854 156, or e-mail to nhalsey@meto.gov.uk.~~

~~12.~~10 An evaluation form to help focus the assessment comments is provided at Attachment 2 ~~to this plan~~.

~~13.~~11 ~~When~~ SIGWX charts produced by the WAFCs for the respective areas of responsibility of the RAFCs Melbourne, New Delhi, Tokyo and Wellington ~~are~~ have been evaluated ~~by the RAFC to be~~ as being of satisfactory quality and accuracy~~.~~. ~~e~~Coordination ~~starts~~ , has been initiated for the transfer of responsibility from the RAFCs to the respective WAFCs. ~~, in consultation with the ICAO Regional Office, Bangkok through the Task Force. Refer to Attachment 1.~~

~~14. In the event that the RAFC can not agree that the WAFC SIGWX charts are of an acceptable quality for flight planning purposes, then ICAO Regional Office, Bangkok, in consultation with the Task Force will be asked to arbitrate.~~

Distribution of WAFS Products

~~15~~12. Initially most States in the Asia/Pacific Region will receive wind, temperature (and humidity in November 2001) forecasts in GRIB, and SIGWX in T4 facsimile format from the two WAFCs by VSAT, either SADIS or ISCS/2. ~~As a backup to VSAT and for those states without VSAT, most~~ A range of WAFS products ~~will~~ may be available via the Internet or where possible through bilateral arrangements with neighbouring national meteorological services. ~~Within the limited resources available, the Task Force will assist states to establish an alternative means for receipt of WAFS products.~~

~~16~~13. In the final phase of WAFS the two WAFCs will distribute by satellite broadcast Global quality controlled, SWH, and Global SWM in raw form. (i.e. not quality controlled) Once suitable decoding software is made available to States in the Asia/Pacific Region, to provide them with the ability tooperationally construct graphical SIGWX from the BUFR messages, and graphical products from the GRIB messages, the T4 facsimile format charts will be eliminated from the satellite broadcasts.

The Production of Regional SWM Charts

~~17~~14. The WAFCs ~~are willing~~ may, where there is a regional requirement, ~~to~~ produce as an interim arrangement (prior to the production of Global SWM in BUFR) SWM charts for limited areas of coverage. The ~~Task Force in conjunction with States in the Asia/Pacific Region, will investigate the~~ requirement ~~or otherwise~~ for the production by the WAFCs of a SWM chart within the Asia/Pacific Region will be investigated in coordination with States and IATA.

The Production of National SWM Charts

~~18~~15. The production and exchange of SIGWX in BUFR (i.e. when the final phase of WAFS is achieved) will add to the benefits derived from the WAFS by the States within the Asia/Pacific Region. ~~It will allow States to produce SWM charts that are harmonised with the SWH charts produced by the WAFCs, by using the Global SWM raw form BUFR messages received from the WAFCs, as the starting point. States will also be able to add value and refine the BUFR SWM messages by adding or modifying areas of turbulence, thunderstorms, etc., based on more recent information. States who produce their own SWM before the Global SWM is received through the WAFS, will be able to send those charts in BUFR to their respective WAFC/s for advice.~~

Indicative Timetable for Achieving the Final Phase of WAFS

~~19~~16. The table ~~below~~ given in Attachment 1 provides an indicat~~ion~~ve timetable for the implementation of the Final Phase of WAFS within the Asia /Pacific Region.

Item	Task/Stage of Implementation of WAFS	Anticipated Date
1	The WAFCs in a position to take over the responsibility for the production of SWH (and SWM re New Delhi) from the RAFCs in the Asia/Pacific Region.	July 2000
2	A reliable communication system implemented within the Asia/Pacific Region to ensure receipt of WAFS products, by all states that require the products, after the transfer of responsibility from RAFCs to WAFCs (either by SADIS, ISCS/2 or other means).	to be determined urgently
3	The establishment of back-up distribution arrangements for WAFS products. There is a requirement to ensure products from the WAFCs can be made available on both SADIS and ISCS/2 broadcasts as well as through the Internet.	August 2000
4	Transfer of responsibility from RAFCs to the WAFCs for the production of SWH and SWM for New Delhi, and the closing down of the RAFCs. Subject to completion of task 2.	September 2000
5	The Task Force through a meeting of the MET Sub-Group to assess the requirement for a SWM chart within the region.	July 2000
6	Implementation of regional SWM if required.	July 2001
7	The provision to states in the region of suitable BUFR decoding software, and the states having the ability to operate the decoding software to convert BUFR SIGWX messages into graphical format. Note: some states may rely on neighbouring NMS to provide decoded SIGWX products.	Late 2001
8	The satellite distribution by the two WAFCs of global SWH and SWM in BUFR format.	early 2002
9	Removal of T4 Facsimile products from the satellite broadcast	2003/4
10	Implementation of the Final Phase of WAFS	2004

Table 3 - Timetable to achieve the Final Phase of WAFS in the Asia/Pacific Region

Volcanic Ash Advisory Centres (VAACs)

20~~17~~. ~~As stated in paragraph 5, t~~The VAACs will have an ongoing role of monitoring WAFS SIGWX charts that cover their areas of responsibility, and advising the appropriate WAFC ~~if the volcanic ash symbol needs to be added or removed~~ to ensure the accurate inclusion of the volcanic ash symbol.

Tropical Cyclone Advisory Centres (TCAC)

21~~18~~. ~~As stated in paragraph 5, t~~The TCACs will have an ongoing role of monitoring WAFS SIGWX charts that cover their areas of responsibility, and advising the appropriate WAFC ~~if the tropical cyclone symbol needs to be added, moved or removed~~ to ensure the accurate inclusion of the tropical cyclone symbol.

Future Work Program for the Task Force

22. The work of the Task Force will continue until the Final Phase of WAFS is implemented within the Asia/Pacific Region, sometime in the year 2004. The tasks that need to be undertaken and/or coordinated by the Task Force are included in Table 3 above and Attachment 1.

15. There are also a number of issues that still need to be addressed by the Task Force, they include:

a. Back-up arrangements for obtaining WAFS products in the event of a SADIS or ISCS/2 failure.

b. A reliable system for providing WAFS products to the smaller States that do not and will not have access to the satellite broadcast.

c. The use of the BUFR code for the dissemination of WAFS graphical products, including the development of suitable BUFR software, distribution of the software, and the ability of states to operate and use the software for the purpose of producing and providing SIGWX products that are of an acceptable quality for flight planning purposes.

Attachment 1

Procedures for the Transfer of Responsibility of RAFC Operations in the Asia Pacific Region to the Two WAFCs.

2 June 2000

Note: this document should be read in conjunction with the ICAO Asia Pacific WAFS Transition Plan and Procedures (Revision 2a - 2 June 2000) produced by the Asia Pacific WAFS Transition Task Force established by the COM/MET/NAV/SUR Sub-Group of APANPIRG.

1. Introduction

1.1 This document specifies the procedures for the transfer of responsibility from the Regional Area Forecast Centres (RAFC) in the Asia Pacific Region to World Area Forecast Centres (WAFC) London and Washington. Once the transfer of responsibility has been completed, the four centres - New Delhi, Tokyo, Wellington and Melbourne will cease to operate as RAFCs.

2. Procedures for Transfer

Step 1 - SIGWX Charts Evaluated to be of Satisfactory Standard

The RAFC in conjunction with users of the SIGWX charts, evaluates the SIGWX chart/s provided by the WAFC/s for its area of responsibility, to be of a satisfactory standard for flight planning purposes.

Step 2 - RAFC to Ensure Recipients of SIGWX can Obtain WAFSs Products

The RAFC to check that all States and carriers that receive SIGWX products produced by the RAFC, have the facilities to receive the equivalent SIGWX products from the WAFC (s) to which the RAFC proposes to transfer responsibility.

Step 3 - Advise Chairman of Task Force and WAFC/s that Chart/s are of Acceptable Standard for Flight Planning

The RAFC advises the Chairman of the WAFS Transition Task Force and the appropriate WAFC(s) (in the case of Melbourne it could take place in two stages, one for transfer to Washington and one for transfer to London) that the RAFC has evaluated the quality of the SIGWX charts for areas (specify chart areas - it will be J and F for Wellington) provided by WAFC Washington/London and finds them to be of an acceptable standard for flight planning purposes.

Step 4 - Advise Chairman of Task Force and WAFC/s of Proposed Transfer Date

The RAFC advises the WAFC(s) and the Chairman of the WAFS Transition Task Force that it is ready to transfer responsibility for the production of SIGWX charts for areas (specify the chart areas as per the Transition Plan) to the WAFC(s). The RAFC, in coordination with the WAFC(s) concerned, will need to specify a date for the transfer of responsibility, one that provides at least **two months** advance notice.

Step 5 - Chairman of the Task Force to Coordinate with Members and Advise ICAO

Having coordinated the proposed transfer of responsibility with the Task Force Members, the Chairman of the ASIA/PAC WAFS Transition Task Force immediately and formally advises the ICAO Regional Director for the Asia Pacific Region that the RAFC is ready to transfer responsibility to the WAFC(s) on the specified date. A copy of the advice is sent to the RAFC and WAFC(s).

Step 6 - ICAO Regional Office to Advise States and WMO

The ICAO Regional Office will advises all states concerned of the proposed transfer of responsibility including the date. The ICAO Regional Office to advise the World Meteorological Organization (WMO).

Step 7 - Action by APANPIRG

APANPIRG produces a report that notes actions taken and formulates a conclusion to amend Table MET 6 of the FASID.

Step 8 - Approval to Cease Operations as a RAFC

The APANPIRG report noting the actions taken, are forwarded to the Air Navigation Commission (ANC) and the ICAO Council.

Step 9 - States Advised

All States concerned are formally advised by ICAO of the approval in accordance with established procedures.

Note: At the date of transfer of responsibilities from the meteorological centre, for the production of SIGWX forecasts to the WAFC/s, the meteorological centre will cease to function as an RAFC.

ASIA/PAC WAFS Transition Plan and Procedures

Attachment 1

Indicative Timetable for achieving the Final Phase of WAFS

Item	Task/Stage of Implementation of WAFS	Anticipated Date
~~1~~	~~The WAFCs in a position to take over the responsibility for the production of SWH (and SWM re New Delhi) from the RAFCs in the Asia/Pacific Region.~~	~~July 2000~~
~~2~~	~~A reliable communication system implemented within the Asia/Pacific Region to ensure receipt of WAFS products, by all states that require the products, after the transfer of responsibility from RAFCs to WAFCs (either by SADIS, ISCS/2 or other means).~~	~~to be determined urgently~~
~~4~~ 1	Transfer of responsibility from RAFCs to the WAFCs ~~for the production of SWH and SWM for New Delhi, and the closing down of the RAFCs. Subject to completion of task 2.~~: for the production of SWH, RAFCs Melbourne, ~~and~~ Wellington and New Delhi RAFC Tokyo for the production SWM, RAFC New Delhi	~~September 2000~~ September 2000 March 2001 September 2000
2	The closing down of the RAFCs Melbourne, New Delhi, Tokyo and Wellington	March 2001
3	The establishment of back-up distribution arrangements for WAFS products. ~~There is a requirement to ensure products from the WAFCs can be made available on both SADIS and ISCS/2 broadcasts as well as through the Internet.~~	~~August 2000~~ to be determined
~~5~~	~~The Task Force through a meeting of the MET Sub-Group to assess the requirement for a SWM chart within the region.~~	~~July 2000~~
~~6~~ 4	~~Implementation of regional SWM if required.~~ Consideration of the requirements for SWM.	July 2001
~~7~~ 5	The provision to ~~s~~States in the region of suitable BUFR decoding software, and the ~~s~~States having the ability to operate the decoding software to convert BUFR SIGWX messages into graphical format. ~~Note: some states may rely on neighbouring NMS to provide decoded SIGWX products.~~	Late 2001
~~8~~ 6	The satellite distribution by the two WAFCs of global SWH and SWM in BUFR format.	early 2002
~~9~~ 7	Removal of T4 Facsimile products from the satellite broadcast	2003/4
~~10~~ 8	Implementation of the Final Phase of WAFS	2004

Evaluation of ~~Test~~ WAFC ~~SIGWX~~ SWH Products

~~(doc: evalsigwxse9.wpd)~~

by _____

Chart from **WAFC London / Washington** Valid .....UTC on...../...../200.....

No	Elements	Comments (mark appropriate box with a V)
1	Jet Streams	1.1 Position - Fully acceptable 9 Mostly OK 9 Not acceptable 9 1.2 Strength - Fully acceptable 9 Mostly OK 9 Not acceptable 9 Comments:
2	Turbulence Areas	2.1 Position - Fully acceptable 9 Mostly OK 9 Not acceptable 9 2.2 Strength - Fully acceptable 9 Mostly OK 9 Not acceptable 9 2.3 Areas - Fully acceptable 9 Mostly OK 9 Not acceptable 9 Comments:
~~3~~	~~Icing~~	~~Comments:~~
~~4~~3	~~Thunderstorms~~ Embedded Cb	4.1 Position - Fully acceptable 9 Mostly OK 9 Not acceptable 9 4.2 Height - Fully acceptable 9 Mostly OK 9 Not acceptable 9 4.3 Areas - Fully acceptable 9 Mostly OK 9 Not acceptable 9
~~5~~4	Surface fronts	Fully acceptable 9 Mostly OK 9 Not acceptable 9
~~6~~5	Tropopause Heights	Fully acceptable 9 Mostly OK 9 Not acceptable 9
~~7~~6	Tropical Cyclones	Fully acceptable 9 Mostly OK 9 Not acceptable 9
~~8~~7	Navigation Information	Sufficient points 9 Mostly OK 9 Not sufficient 9
~~9~~8	Overall Acceptability	Fully acceptable 9 Mostly OK 9 Not acceptable 9 Comments:

Evaluation by: _____ Date: ...../...../.....

ASIA/PAC ANP (FASID)

TABLE MET 5 - REQUIREMENTS FOR WAFS PRODUCTS

EXPLANATION OF THE TABLE

PRODUCT REQUIRED

W/T Chart	=	Wind and temperature chart
~~SWL~~	=	~~Low level significant weather chart (<FL 100) should be provided outside the WAFS~~
SWM	=	Medium level significant weather chart (FL 100 - 240)
SWH	=	High level significant weather chart (FL 250 - ~~450~~ 630)

CHART COVERAGE REQUIRED

D, E, F, G, H, I, J, K=Maximum area of coverage required (see Charts MET 2, 3 and 4 attached to Table MET 6)

TABLE MET 5 - REQUIREMENTS FOR WAFS PRODUCTS

PRODUCT REQUIRED	AREAS REQUIRED
W/T CHART > FL 390	D, E, F, G, I, J
A @ A @ FL 390	D, E, F, G, I, J
A @ A @ FL 340	D, E, F, G, I, J
A @ A @ FL 300	D, E, F, G, I, J
A @ A @ FL 240	D, E, F, G, I, J
A @ A @ FL 180	D, E, F, G, I, J
A @ A @ FL 100	D, E, F, G, I, J
A @ A @ FL 50	D, E, F, G, I, J
~~SWL CHART~~	
SWM (FL 100 - ~~240~~ 450)	D
SWH CHART (~~above~~ FL 250 - 630)	D, E, F, G, I, J, K
GRIB data	GLOBAL
~~WINTEM and~~ Amendment to SIGWX forecasts in abbreviated plain language	D, E, F, G, I, J, K

~~Note : SWL charts should be provided outside the WAFS~~.

ASIA/PAC ANP (FASID)

TABLE MET 6 - RESPONSIBILITIES OF THE WORLD AREA FORECAST CENTRES

EXPLANATION OF THE TABLE

Column

1 Name of the world area forecast centre (WAFC).

2 Area of responsibility for the preparation of significant weather (SIGWX) forecasts by the WAFC in Column 1.

3 Area of coverage of the SIGWX charts prepared or relayed by the WAFC in Column 1.

4 Area of coverage of the upper-wind and temperature charts prepared by the WAFC in Column 1.

5 Area of coverage of the GRIB data prepared by the WAFC in Column 1.

TABLE MET 6 B RESPONSIBILITIES OF THE WORLD AREA FORECAST CENTRES

WAFC	SIGWX		Upper wind and temperature	
	Area of responsibility	Areas of coverage of SIGWX	Areas of charts coverage	GRIB data
London	global[1]	D[2], ASIA SOUTH MEDIUM[32], E[4],G[5], K	D, E, G	global
Washington	global[1]	F[6], I[7], J[8]	F, I, ~~J~~	global

Note : All SIGWX charts are for FL250 – 630 ~~and above~~, except for ASIA SOUTH

[1] For back-up purposes

[2] ~~Currently also produced by RAFC New Delhi~~

[32] Special medium level chart (FL100 - ~~240~~ 450)

[4] ~~Currently produced by RAFCs Tokyo and Melbourne and relayed to London for uplink on SADIS~~

[5] ~~Currently produced by RAFC Tokyo and relayed to London for uplink on SADIS~~

[6] ~~Currently produced by RAFCs Melbourne and Wellington and relayed to Washington for uplink on ISCS~~

[7] ~~Currently produced by RAFC Tokyo and relayed to Washington for uplink on ISCS~~

[8] ~~Currently produced by RAFC Wellington and relayed to Washington for uplink on ISCS~~

Future Work Programme for the ASIA/PAC WAFS Transition Task Force

The issue to be addressed by the ASIA/PAC WAFS Transition Task Force include :

- Development of guidelines for the use of BUFR and GRIB codes for the production of WAFS products.
- Planning and coordinating the transfer of SIGWX and WIND/TEMP charts from the current T4 facsimile format to BUFR and GRIB format.
- Development of a regional training programme for the operational use of BUFR and GRIB.
- Participate in the development and implementation of an adequate WAFS back-up system for dissemination of WAFS products in the Asia/Pacific Regions.

Fourth Meeting of COM/MET/NAV/SUR Sub-Group to APANPIRG
Attachment 1 to the Report

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Fourth Meeting of COM/MET/NAV/SUR Sub-Group to APANPIRG
Attachment 1 to the Report

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LIST OF WORKING PAPERS

WP/No.	Agenda Item	Subject	Presented by
1	-	Provisional Agenda	-
2	4	Second ATN Transition Task Force Meeting	Rapporteur
3	2	List of Noted Shortcomings and Deficiencies in the CNS and MET fields	Secretariat
4	1	Action on Decisions/Conclusions of COM/MET/NAV/SUR SG/3	Secretariat
5	1	Tasks List of the COM/MET/NAV/SUR Sub-Group	Secretariat
6	1	Report of the APANPIRG Sub-Group Work Programme Review Task Force	Chairman of the Task Force
7	1	Outstanding Conclusions	Secretariat
8	10	ASIA/PAC Basic ANP and FASID	Secretariat
9	4	Guidance Material for Ground Elements in ATN Transition	Japan
10	4	Proposed Amendments to the ASIA/PAC Regional Plan for the New CNS/ATM Systems	Japan
11	7a)	Implementation of ISCS and SADIS in the ASIA/PAC Regions	Secretariat
12	7b)	Requirements for WAFS Products – Final Phase of WAFS	Secretariat
13	8	Planning and Implementation of OPMET Data Exchange	Secretariat
14	8	ROBEX Scheme – Auckland MCC and TCC	New Zealand
15	9	Progress in Implementation of the International Airways Volcano Watch	Secretariat
16	9	Volcanic ASH and Aircraft Operations Regional Handbook	Chairman of the WG on Volcanic Ash
17	6	Strategy for the Provision of GNSS Augmentation in the ASIA/PAC Region	Secretariat
18	6	Review of Strategy for the Provision of Precision Approach	Secretariat

		and Landing Guidance Systems	
19	9	Darwin VAAC Area of Responsibility	Australia
20	9	Eruption of the Mayon Volcano Safety Issue	Australia
21	1	Key Priorities for CNS/ATM Implementation	Secretariat
22	7b)	Status Report of Implementation of Transition to the Final Phase of WAFS	Chairman of the WAFS Transition Task Force
23	7b)	Report from the ASIA/PAC WAFS Transition Task Force	Chairman of the WAFS Transition Task Force
24	7a)	Some Issues of Implementation of the ISCS and SADIS	Australia
25	3	Provision of the New Route B-330	Mongolia
26	8	Implementation of OPMET Data Exchange in Mongolia	Mongolia
27	8	Introduction of New Aviation Weather Centre at the Inchon Airport and of the Implementation Plan of MWO, MCC/TCC and VOLMET	Republic of Korea
28	12	Key Aviation Issues for Consideration by States in Preparation for WRC 2000	Australia
29	6	IFR GPS Approvals	Australia
30	9	Volcanic Ash Warning Study Group	Australia
31	3	Review Operation of AFS Circuits in the Bay of Bengal Area	Secretariat
32	7a)	Strategic Assessments Tables	United Kingdom
33	5	Frequency Congestion Problem on MWARA Network and a Proposal to Include SIGMET in HF VOLMET Broadcast	Secretariat
34	7a)	Follow up of the SADIS OPSG/5 Meeting	Secretariat
35	3	Upgrading of AFTN	Russian Federation
36	2	The Need for Additional SSR Codes for ATS in the Asian Part of Russia	Russian Federation
		Effects of Selective Availability on GPS Accuracy in	

37	6	Singapore	Singapore
38	7b)	Preliminary Evaluation on Sector E Significant Weather Chart	Singapore
39	4	AMHS Implementation Activities in Republic of Korea	Republic of Korea

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IP/No.	Agenda Item	Subject	Presented by
1	-	Meeting Bulletin	-
2	12	The Results of the ITU World Radiocommunication Conference -2000 (WRC-2000)	Secretariat
3	7b)	Wellington Regional Area Forecast Centre (RAFC)	New Zealand
4	7b)	Reception of WAFS and EMWIN Broadcasts in the Service Area of the Wellington Regional Area Forecast Centre (RAFC)	New Zealand
5	12	Inter-regional Coordination	Secretariat
6	7a)	Planning for WAFS Transition in Hong Kong, China	Hong Kong, China
7	6	Status of Development of Standards and Recommended Practices (SARPs) for the Global Navigation Satellite System (GNSS)	Secretariat
8	3	CAAC Frame Relay Network	China
9	6	Status of GNSS Standardization	Secretariat
10	5	AIRCOM Transition from ACARS to ATN	SITA
11	4	AMHS Implementation Activities and Planning in Japan	Japan
12	3	AFTN Circuit Loading Statistics in Tokyo	Japan
13	8	TAF Verification System in Australia	Australia
14	8	Aeronautical Meteorological Service in CAAC	China
15	5	Status of Safe Flight 21	USA
16	5	VHF Digital Link (VDL) Implementation Planning and Research and Development Activities in Japan	Japan
17	3	Status of PSS1 Speech Circuit Implementation between FAA and JCAB	Japan
18	6	Recent Developments in the Modernization of the Global	USA

		Positioning System (GPS) and U.S. Satellite Navigation Program Status	
19	7a)	Implementation of the International Satellite Communications System (ISCS) by the United States	USA
20	7	Mutual Backup by World Area Forecast Centres of World Area Forecast System Products and Backup of Satellite Broadcasts	USA
21	9	Findings of the Bilateral Meeting between the Washington and Buenos Aires Volcanic Ash Advisory Centres	USA
22	12	Report on the Outcomes from WRC-2000 in Relation to Those Agenda Items of Direct Interest to Aviation	Australia
23	12	Regulatory Reform in Australia	Australia
24	6	Review of Ground Based Regional Augmentation System (GRAS) Development in Australia	Australia
25	6	Status of the Validation of GNSS Standards and Recommended Practices	Australia
26	6	Testing Guidance for GNSS	Australia
27	6	Australian Global Navigation Satellite System Coordination Committee	Australia
28	6	Selective Availability Effects in Australia 2 May 2000	Australia
29	6	Ground Based Regional Augmentation System Flight Test Results	Australia
30	12	Free Flight Phase I	USA
31	3	Decommission of the Circuit between Tokyo and Taegue	Japan
32	7b)	Termination of the HF Radio Broadcast (JMJ)	Japan
33	7a)	MATRA MACRONI Space Digital Receiver Report	United Kingdom
34	5	Introduction of ATS (FANS) Route L888 Engineering Project	China
35	8	Data Link Application Related to OPMET Information	Secretariat

36	6	Current Status of GLONASS and GLONASS-M Systems and Plans for Their Future Development	Russian Federation
37	6	The Concept of GNSS Implementation in Russian Federation	Russian Federation
38	6	Workshop on Regional Global Navigation Satellite System (GNSS) 23-24 March 2000, Singapore	Singapore
39	9	Activities of the Tokyo VAAC for the Eruptions of Mayon Volcano	Japan