International Civil Aviation Organization

FIFTEENTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/15)

Bangkok, Thailand, 23 to 27 August 2004

Agenda Item 2.2: **ASIA/PAC Air Navigation System and Related Activities CNS/MET Matters**

Agenda Item 3: **CNS/ATM Implementation and Related Activities**

REPORT OF THE EIGHTH MEETING OF COMMUNICATIONS, NAVIGATION, SURVEILLANCE/ METEOROLOGY SUB-GROUP (CNS/MET SG/8)

(Presented by the Chairman)

SUMMARY

This paper presents a report of the Eighth Meeting of the CNS/MET Sub-Group held in Bangkok from 12 to 16 July 2004. The meeting formulated 29 Draft Conclusions, 6 Draft Decisions and 1 Decision including proposals for amendment of CNS part of the ASIA/PAC FASID for consideration by APANPIRG/15.

1. INTRODUCTION

1.1 The Eighth Meeting of Communications, Navigation, Surveillance/Meteorology Sub-Group of APANPIRG (CNS/MET SG/8) was held in Bangkok from 12 to 16 July 2004. The meeting was attended by 80 participants from 21 States, WMO, IATA and SITA.

1.2 The meeting considered 47 Working Papers and 35 Information Papers covering its 16 Agenda Items.

1.3 The meeting formulated 29 Draft Conclusions, 6 Draft Decisions and 1 Decision on various CNS/MET issues including amendment to the FASID Tables for consideration by APANPIRG/15.

2. DISCUSSION

2.1 The CNS/MET SG/8 meeting formulated the following Draft Conclusions and Draft Decisions for consideration by APANPIRG/15:

Draft Conclusion 8/1 - Use of X.25 protocol

That, States continue using X.25 as recommended protocol to support implementation of ATN ground infrastructure in the short to medium term (5-10 years) and consider acquisition of sufficient spares for the service life of the equipment.

Draft Conclusion 8/2 – Development of AMHS Addressing Scheme and PRMD value for ASIA/PAC region

That,

i) Hong Kong, China be requested to develop a comprehensive draft of the AMHS Addressing Scheme and PRMD value for each State in the ASIA/PAC region with options of both XF and CAAS address and present it to the ATN Transition Task Force Working Group Meeting in September for review and comments; and

ii) ICAO be requested to circulate the addressing scheme to States for consideration.

Draft Conclusion 8/3 – AMHS Naming Registration Form

That, the AMHS Naming Registration Form provided in Appendix C be adopted and circulated to States.

Draft Conclusion 8/4 -Use of AMHS over TCP/IP in the ASIA/PAC region

That, Administrations within the ASIA/PAC region willing to pursue the implementation of the TCP/IP subnet as part of ATN may do so on a bilateral basis on the understanding that they may be required to make changes to their subnet if and when the TCP/IP is developed as a part of the ATN SARPs.

Draft Conclusion 8/5 – ASIA/PAC Regional ATN Implementation System Management Operational Procedures

That, the ASIA/PAC Regional ATN Implementation System Management Operational Procedures provided in Appendix D be adopted and circulated to States to assist in implementation of the ATN ground infrastructure in the ASIA/PAC region.

Draft Conclusion 8/6 – Table CNS-1D - AIDC

That,

a) ICAO be requested to circulate Table CNS-1D provided in Appendix E to States to specify operational requirements for AIDC; and

b) provide results of the consultation to the next meeting of the ATN Transition Task Force.

Draft Conclusion 8/7 – Amendment Table CNS-1C – ATSMHS Implementation Plan

That, the sample Table CNS-1C – ATSMHS Implementation Plan provided in ASIA/PAC FASID, Part IV CNS be replaced with the Table CNS-1C shown in Appendix F through the established procedure.

Draft Conclusion 8/8 – Amendment to Table CNS-1B – ATN Router Plan

That, the existing Table CNS-1B provided in ASIA/PAC FASID, Part IV CNS be replaced with an updated Table contained in Appendix G.

Draft Conclusion 8/9 – Amendment of the Table CNS-1A – AFTN Plan

That, the Table CNS-1A – AFTN Plan and Chart CNS-1 reflected in Part IV CNS of the ASIA/PAC FASID be replaced with an updated Plan provided in Appendix H in accordance with established procedure.

Draft Conclusion 8/10 – Procedure for calculation of AFTN Circuit Loading Statistics

That, the guidelines for calculation of AFTN circuit loading statistics contained in Attachment A to ASIA/PAC FASID Part IV CNS be amended to add the maximum number of bytes transmitted/received on 9600 bps and 64 Kbps, X.25, AFTN circuits.

Draft Decision 8/11 – Subject/Tasks List of the ATN Transition Task Force

That, the updated Subject/Tasks List of the ATN Transition Task Force provided in Appendix I be adopted.

Draft Decision 8/12 – Assignment of a new Task

That, the ATN Transition Task Force be tasked to:

i) develop ATN/AMHS performance characteristics as soon as possible to meet the target date of implementation of 2005; and

ii) establish a sunset date for AFTN service to be reflected in Part IV of the ASIA/PAC FASID.

Decision 8/13 - Development of a Regional Strategy for the implementation of AMS communications data links

That, a Working Group be established to develop regional strategy for the implementation of AMS communications data link and that, the strategy be available for consideration at the CNS/MET SG/9 Meeting.

Note: *Details of the TOR, membership, working method and Rapporteur of the Working Group are contained in the Appendix J to this report on Agenda Item 4.*

Draft Conclusion 8/14 - Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region

That, the updated Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region provided in Appendices K and L respectively, to the report on Agenda Item 5 be adopted and provided to States.

Draft Conclusion 8/15 - Revision of FASID Table CNS-3 by States

That, States review and revise FASID Table CNS-3 to indicate comprehensive descriptions of the future provision of radio navigation aids and that the revised entries be provided to the Regional Office by the end of May 2005.

Draft Conclusion 8/16 - Airlines plan for the deployment of ADS-B

That, IATA be requested to conduct a survey of its member airlines' plan for the deployment of ADS-B in the ASIA/PAC region and provide result to the next meeting of the ADS-B Task Force or its Working Group.

Draft Conclusion 8/17 – Exchange of ADS-B surveillance data with neighbours

That, States be encouraged to share ADS-B surveillance data with neighbouring States and to develop mechanisms to achieve this as ADS-B ground infrastructure requirements are being identified during the design phase.

Draft Decision 8/18 – Subject/Tasks List of ADS-B Study and Implementation Task Force

That, the Subject/Tasks List of the ADS-B Study and Implementation Task Force provided in Appendix M be adopted.

Draft Conclusion 8/19 - SADIS Internet-based FTP Service

That, in parallel with the satellite broadcast, the SADIS Provider State be invited, as of 1 July 2005, to make WAFS forecasts and OPMET data available, as a primary component of the SADIS service, in accordance with the *SADIS User Guide,* through the Internet-based FTP service.

Note 1.— The development and management of this service will be overseen by the SADISOPSG and its work programme will be amended accordingly.

Note 2.— The SADIS Cost Recovery Administrative Group (SCRAG) will be informed of the planned date of implementation.

Draft Conclusion 8/20 - 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.

Draft Conclusion 8/21 - State's migration plans for the transition from 1G to 2G SADIS service

That, the SADIS user States in the ASIA/PAC Region be encouraged to commence planning for transition from SADIS 1G to 2G to ensure that it can be achieved well within the agreed time scale, i.e. before the termination of the 1G service on 31 December 2008.

Draft Conclusion 8/22 - Annual Surveys of the Operational Efficacy of the ISCS/2 and Nomination of ISCS Focal Points

That,

a) the ISCS Provider State in coordination with ICAO Secretariat be invited to conduct annual surveys of the operational efficacy of the ISCS/2 in the ASIA/PAC Regions starting 2004-2005 and report the results to the CNS/MET Sub-group meetings; and

b) ICAO invite the ISCS user States in the ASIA/PAC Regions to nominate operational personnel to act as an ISCS focal point to facilitate coordination of ISCS related matters.

Notes:

(1) It is proposed that the format of the annual survey questionnaire and summary report will be similar to those for SADIS operational efficacy in order to allow inter comparison.

(2) The ICAO Regional Office will assist in circulating the survey questionnaire to the ISCS user States with copy to ISCS focal points and in collecting the responses to be analyzed by the ISCS Provider State.

Draft Conclusion 8/23 - Limited extension of the availability of WAFS forecasts in chart form beyond 1 July 2005

That, the WAFSOPSG be invited to consider, as a matter of urgency, the continuation of the issuance of WAFS SIGWX forecasts in a chart form, for a limited period of time after 1 July 2005 to ensure that the WAFS users be prepared to operationally use BUFR-coded WAFS products in SIGWX chart production.

Draft Conclusion 8/24 – States' Actions for the Migration to the Operational Use of GRIB and BUFR Coded WAFS Products

That,

(a) States in the ASIA/PAC Regions be urged to complete, as a matter of urgency, the necessary preparations for the migration to the operational use of GRIB and BUFR coded WAFS products, if they have not already done so, prior to target date for final migration to GRIB and BUFR-coded WAFS products, 1 July 2005;

Note: States having difficulties in the migration to the operational use of GRIB and BUFR coded WAFS products be reminded to urgently approach WMO for assistance under the WMO Voluntary Cooperation Programme (VCP). In order to expedite WMO consideration of VCP requests, States are encouraged to contact potential donors and subsequently inform WMO.

(b) be urged to review the GRIB and BUFR visualization software evaluation results available on the WAFSOPSG and SADIS websites and ensure that software packages capable of producing WAFS forecast charts fully compliant with Annex 3 are acquired;

(c) arrange for appropriate personnel to attend the training on the operational production of GRIB and BUFR coded WAFS products provided conjointly for the SADIS and ISCS user States to be held in the ASIA/PAC Regions in January 2005.

Draft Conclusion 8/25 - Automatic Depiction of SIGWX Forecast In Chart Form from BUFR-coded WAFS Products

That, the WAFSOPSG and SADISOPSG be invited to consider, as a matter of urgency, the requirement for eliminating the need for human intervention with regard to the depiction of SIGWX forecast in chart form from BUFR-coded WAFS products.

Note: The SADIS Provider State should liase with the WAFS workstation manufacturers with a view to carrying out a further evaluation of their software against this new requirement.

Draft Conclusion 8/26 - ASIA/PAC WAFS Implementation Plan and WAFS Implementation Task Force

That,

(a) the ASIA/PAC WAFS Implementation Plan and Procedures be amended as shown in Appendix O to the report to reflect the changes in the plans and schedules of the two WAFCs in the migration to GRIB and BUFR;

(b) the work programme of the WAFS Implementation Task Force be amended as given in Appendix P to this report

Draft Decision 8/27 – Terms of reference and work programme of OPMET/M TF

That, the terms of reference and the work programme of the OPMET management Task Force be amended as shown in Appendix Q to the Report.

Draft Decision 8/28 – 12th edition of the ROBEX Handbook and 3rd edition of the ASIA/PAC ICD

That, ICAO publish the new 12th edition of the ROBEX Handbook and the new 3rd edition of the ASIA/PAC Interface Control Document for Access to the Regional OPMET Data Banks (RODB), as shown in Appendix R and Appendix S to the report, in accordance with the established procedures.

Draft Conclusion 8/29 – Fostering the standardization of OPMET bulletins in the ASIA/PAC region

That, the States in the ASIA/PAC Region be urged to fully implement the provisions related to the format of the METAR, SPECI and TAF messages and bulletins specified in the Annex 3 and in WMO Manual on Codes (WMO No. 306).

Note: OPMET/M TF will provide the States concerned with specific information regarding the observed discrepancies from the standard formats.

Draft Conclusion 8/30 - New data type designators for bulletins containing special air-reports

That, in order to facilitate the exchange of the special air-reports, WMO be invited to designate a new data type designators (T_1T_2) for the WMO abbreviated headings of the bulletins containing special air-reports and, in particular, for special air-reports for volcanic ash.

Draft conclusion 8/31 - Feasibility of extending the validity of TAF to 30 hours

That, ICAO be invited to study in coordination with WMO the feasibility of the introduction of a new TAF with period of validity of 30 hours in view of the emerging new requirements for very long haul flights.

Draft Decision 8/32 – Planning for migration to BUFR-coded aeronautical meteorological messages

That,

a) the ATN Transition Task Force and the OPMET Management Task Force be tasked to address the issues related to the transition to BUFR-coded aeronautical meteorological messages by conduct studies, as necessary;

b) the two Task Forces develop in coordination a regional plan for migration to BUFR-coded aeronautical meteorological information.

Note: A conjoint meeting of the two Task Forces would be desirable to address the issues after completing studies in their respective areas.

Draft Conclusion 8/33 — Designation of State volcano observatories

That, ICAO Regional Office,

a) carry out a survey with the ASIA/PAC States, that maintain volcano observatories monitoring active volcanoes, in order to designate selected volcano observatories for inclusion in the ASIA/PAC Basic ANP and FASID (Doc 9673), following the principles formulated by the IAVWOPSG; and

b) Introduce a new FASID Table MET 3C listing the designated State volcano observatories required to provide direct notification of volcanic activity to ACCs, MWOs and VAACs.

Draft Conclusion 8/34 – Implementation of SIGMET tests in the ASIA/PAC Regions

That, ICAO Regional office invite all TCAC and VAAC Provider States in ASIA/PAC Regions, and all ASIA/PAC States with MWOs responsible for issuance of SIGMET for volcanic ash and/or tropical cyclones, to take active part in the regular SIGMET tests to be carried out according to the agreed procedures.

Note: ICAO Regional Office will coordinate the tests and notify the participating States about their schedule and procedures.

Draft Conclusion 8/35 - Improvement of issuance of SIGMET for tropical cyclones

That, State be urged

a) in preparing SIGMET for tropical cyclone to pay due attention to the TC advisories issued by the responsible TCACs ; and

b) to provide feed-back on the availability and the quality of the TC advisories provided by the responsible TCACs in order to assist in eliminating any deficiencies.

Draft Decision 8/36- Updated Subject/Tasks List of the CNS/MET Sub-Group

That, the updated Subject/Tasks List of the CNS/MET Sub-Group presented in Appendix A4 be adopted.

3. ACTION BY APANPIRG

3.1 The meeting is invited to:

a) review report of CNS/MET SG/8 meeting;

b) take actions on Draft Conclusions and Draft Decision; and

c) note the Decision 8/13 in page 3 of this paper.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

REPORT OF THE EIGHTH MEETING OF COMMUNICATIONS, NAVIGATION AND SURVEILLANCE/ METEOROLOGY SUB-GROUP (CNS/MET/SG/8)

BANGKOK, THAILAND 12– 16 JULY 2004

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/15 Meeting and any formal action taken will be published in due course as a Supplement to the Report of the APANPIRG Meeting.

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

History of the Meeting

Page

Report on Agenda Items

Attachments

List of Appendices:

1. Introduction

1.1 The Eighth Meeting of the Communications, Navigation and Surveillance/Meteorology Sub-Group (CNS/MET SG/8) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held in "the Kotaite Wing" of the ICAO Asia and Pacific Regional Office Bangkok, Thailand from 12 to 16 July 2004.

2. Attendance

2.1 The meeting was attended by 80 experts from 21 States, WMO, IATA, and SITA. A list of participants is in Attachment 1.

3. Opening of the Meeting

3.1 Mr. L B. Shah, Regional Director, ICAO Asia and Pacific Office welcomed all participants to Bangkok, particularly to "the Kotaite Wing" of the ICAO Asia and Pacific Regional Office.

3.2 Mr. Shah highlighted major activities conducted early this year in the CNS and MET fields. He stated that it is a matter of pride that the 11th Air Navigation Conference (AN-Conf/11) noted the work done in this region for implementation of ADS-B and formulated Recommendations in line with the Conclusions of APANPIRG/14. The Air Navigation Commission, among others adopted two Recommendations formulated by the AN-Conf/11 relating to the Near-Term Strategy and Support of Long-Term ADS-B requirement. This action has provided global endorsement of the work done in the ASIA/PAC region.

3.3 He emphasized the need to assign high priority to address the air navigation deficiencies. He stated that the Deficiency Review Task Force of APANPIRG has finalized its recommendation for a Supplement to the Uniform Methodology on identification, assessment and reporting of air navigation deficiencies. The Future Direction Task Force meeting of APANPIRG held in May 2004 reviewed the organization of the contributory bodies of APANPIRG and has developed recommendations for consideration by APANPIRG/15. The results of these Task Force meetings would be presented to this meeting for review and comment. He noted that States had corrected many of the deficiencies included in the list of Deficiencies developed by APANPIRG/14. He highlighted the objectives of this meeting in the CNS and MET fields.

3.4 He emphasized that in the MET field the meeting should address the outstanding tasks to the final migration to GRIB and BUFR coded WAFS products in view of the target date for this migration, 1 July 2005. He expressed pleasure in hosting the first meeting of the International Airways Volcano Watch (IAVW) Operations Group in March 2004, which was established by the ANC to pursue issues related to the successful implementation of the IAVW.

3.5 Mr. Jeffrey Bollard, Chairman of the CNS/MET Sub-Group highlighted main issues to be addressed by the meeting.

4. Officers and Secretariat

4.1 Mr. Jeffrey Bollard acted as Chairman of the meeting. Mr. Lo Weng Kee, Senior Engineer, Civil Aviation Authority of Singapore and Mr. Shun Chi-ming, Senior Scientific Officer of Hong Kong Observatory, Vice-Chairmen of the Sub-Group attended the meeting.

4.2 Mr. K .P. Rimal, Regional Officer, CNS and Mr. Dimitar H. Ivanov, Regional Officer, Aeronautical Meteorology acted as Secretaries of the meeting who were assisted by Mr. Li Peng, Regional Officer, CNS.

5. Organization, Working Arrangement, Language and Documentation

5.1 The working language was English inclusive of all documentation and this report. The Sub-Group met as a single body on 12, 15 and 16 July 2004 to deal with subjects of common interest. On other days the CNS and MET Working Groups met separately to deal with specific tasks. Ad-hoc Working Group met separately to deal with specific issues in the CNS field. A list of Working Papers and Information Papers presented at the meeting is at Attachment 2.

6. Terms of Reference of the CNS/MET Sub-Group

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 System in the CNS/MET field;

2) Review and identify deficiencies that impede the implementation or provision of efficient CNS/MET services in the ASIA/PAC region;

3) Monitor CNS/ATM system 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 system; and

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

7. Conclusions and Decisions - Definition

7.1 The Sub-Group of APANPIRG records its actions in the form of Draft Conclusions and Draft 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 establishment 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 Sub-Group only.

Agenda Item 1: Adoption of provisional agenda

1.1 The meeting adopted the provisional agenda presented to the meeting as follows:

Agenda Item 1: Adoption of provisional agenda

Agenda Item 2: Review:

1) action on the report of CNS/MET/SG/7 Meeting;
2) relevant action items of the 40th DGCA Conference related to CNS/MET systems; and
3) result of the Future Direction Task Force Meeting.

Agenda Item 3: Aeronautical Fixed Service:

1) review report of the Sixth Meeting of the ATN Transition Task Force.

Agenda Item 4: Aeronautical Mobile Service:

1) review operation of CPDLC; and
2) review result of AN Conf/11 on Agenda Item 7.

Agenda Item 5: Radio Navigation Aids:

1) review strategies for Precision Approach and Landing Guidance Systems and GNSS Implementation; and
2) review result of AN Conf/11 on Agenda Item 6.

Agenda Item 6: Surveillance:

1) review report of Second ADS-B Study and Implementation Task Force; and
2) review surveillance systems.

Agenda Item 7: Aeronautical electromagnetic spectrum utilization:

1) review result of AN-Conf/11 on Agenda Item 5; and
2) review preparations for WRC-2007.

Agenda Item 8: Review of the implementation of WAFS:

1) implementation of ISCS and SADIS; and
2) transition to GRIB and BUFR coded WAFS products.

Agenda Item 9: Exchange of OPMET Information:

1) review of the report of OPMET/M TF/2 meeting; and
2) review of the regional guidance documents on OPMET.

Agenda Item 10: Review of the implementation of ICAO Warning Systems:

1) International Airways Volcano Watch (IAVW); and
2) Tropical cyclone watch

Agenda Item 11: Quality assurance in the MET field

Agenda Item 12: MET support for operations at aerodromes and terminal areas

Agenda Item 13: CNS/ATM systems implementation:

1) CNS
2) MET

Agenda Item 14: Review of deficiencies in the CNS and MET fields:

1) review report of DRTF/2 meeting
2) review and update the List of Deficiencies in CNS and MET fields

Agenda Item 15: Future Work Programme

Agenda Item 16: Any other business

Agenda Item 2: Review:

1) **action on the report of CNS/MET/SG/7 Meeting;**
2) **relevant action items of the 40th DGCA Conference related to CNS/MET systems; and**
3) **result of the Future Direction Task Force Meeting.**

1) Action on the report of CNS/MET SG/7

2.1 The meeting carried out a review of the actions taken by APANPIRG/14, Air Navigation Commission (ANC) and the Council on Decisions and Conclusions formulated by the Seventh Meeting of the CNS/MET Sub-Group held in Bangkok from 15 to 21 July 2003. The meeting also noted with satisfaction actions taken by States and the Secretariat. The result of the review is provided in Appendix A

2) Relevant action items of the 40th DGCA Conference related to CNS/MET systems

2.2 The 40th Conference of Directors General of Civil Aviation (DGCAs), Asia and Pacific Regions held in Ulaan Baatar, Mongolia from 1 to 5 September 2003 noted with appreciation the satisfactory work carried out by States, ICAO and international organizations to achieve satisfactory result at WRC-2003 and agreed that concerted efforts should be made to safeguard aviation interest at WRC-2007 and formulated Action Item 40/5. This action strongly urged States to nominate a contact person responsible for preparation for WRC-2007 in each Administration and ensure active participation of aviation representatives at national level discussions and at regional forum to support ICAO Position for WRC-2007.

2.3 Hong Kong, China informed the meeting that the 41 DGCA Conference will be hosted by Hong Kong, China from 1 to 5 November 2004 and encouraged members of the CNS/MET Sub-Group to attend.

3) Result of the Future Direction Task Force Meeting

2.4 The Future Direction Task Force (FDTF) meeting of APANPIRG was held from 17 to 19 May 2004 at the " Kotaite Wing " of the ICAO Asia and Pacific Office in Bangkok, Thailand. The objective of the Task Force was to make recommendations that may be necessary in the operation of APANPIRG's contributory bodies to ensure that APANPIRG was fulfilling its mandate in line with the Procedural Handbook and taking into account results of AN-Conf/11.

2.5 It was noted that FDTF had developed 4 Draft Decisions for consideration by APANPIRG/15 as follows:

Draft Decision 1/1: Dissolution of CNS/ATM Implementation Coordination Sub-Group;

Draft Decision 1/2: Implementation of AN-Conf/11 Recommendations by APANPIRG;

Draft Decision 1/3: Assignment of new Tasks to the ATM/AIS/SAR and CNS/MET Sub-Groups; and

Draft Decision 1/4: Dissolution of the Future Directions Task Force.

2.6 The meeting noted the reasons given for proposing dissolution of the CNS/ATM IC Sub-Group and supported the Draft Decision 1/1.The meeting was also in agreement of the assignment of Tasks to the CNS/MET Sub-Group as indicated in the Draft Decision 1/2 and 1/3.

Outstanding Conclusions

2.7 A list of Outstanding Conclusions in the CNS/MET fields was reviewed. The list of Outstanding Conclusions was further updated indicating the progress of actions taken by States and the Secretariat. The updated list is provided in Appendix B.

Agenda Item 3: Aeronautical Fixed Service

1) review report of the Sixth Meeting of the ATN Transition Task Force.

Review report of the Sixth Meeting ATN Transition Task Force

3.1 The meeting noted with appreciation the tasks accomplished by the Sixth Meeting of the ATN Transition Task Force held in Bali, Indonesia from 26 to 30 April 2004 and endorsed the draft Conclusions and Decisions.

Reference Document for the ATN Router Description

3.2 The meeting noted that the ATN Transition Task Force had developed reference document on description for the ASIA/PAC regional ATN ground-ground router to be used as an advisory document. The document was prepared to provide description of the ground-ground router related protocols, performance, network management and security requirements. The document would facilitate implementation of ATN infrastructure in the region.

Study of X.25 Protocol

3.3 It was noted that the ATN Transition Task Force had conducted a thorough study of impact of X.25 capability within the region to determine the availability and the need for X.25 technology. It was observed that the regional ATN network unlike in the EUR region is not dependent on X.25 packet switched networks, but uses a private leased channels for point-to-point communication between ATN routers, which provides the necessary data relay functionality. In most cases, the communication links will be “clear channel” links, and the only X.25 equipment required are the X.25 cards and software built into the ATN routers.

3.4 IATA expressed the view that an alternate technology should be sought like in the EUR region to replace X.25 and was of the view that TCP/IP solution should be pursued during the near-term.

3.5 It was also pointed out that X.25 boards will be readily available and will serve adequately to allow the regional ATN network to be established and to operate in the short-to-medium term (5 to 10 years).

3.6 The incorporation of the IP subnetwork dependent convergence function (SNDCF) into SARPs is anticipated, but is expected to take at least a further year; after this, there can be a delay from formal publication in Technical Specifications document until the availability of such functionality in commercial (rather than experimental) ATN routers. The IP SNDCF should allow the replacement of point-to-point X.25 connections in the ATN ground network with IP connections in the medium-to-long term. The study further indicated that Investment in X.25 products by the vendor is continuing; X.25 cards are being updated to remain compatible with the latest bus standards, and there is a stated intention to support newer emerging bus standards when they enter the mainstream.

3.7 Based on the result of study, it was concluded that in the short-to-medium term (5 to 10 years) that X.25 will be suitable to be used in the region. In the medium to long-term, it is recommended that ATN equipment will be able to be upgraded to interconnect by using IP when the ATN SARPs have been developed and are mature enough to be implemented. Accordingly, the meeting formulated the following Draft Conclusion:

Draft Conclusion 8/1 - Use of X.25 protocol

That, States continue using X.25 as recommended protocol to support implementation of ATN ground infrastructure in the short to medium term (5-10 years) and consider acquisition of sufficient spares for the service life of the equipment.

AMHS Addressing Schemes and Private Management Domain (PRMD) Name Value

3.8 The Secretariat presented a paper summarizing the information provided by States in reply to State Letter SP 54/1 – 03/39 sent to States by ICAO Secretary General on May 2003 concerning the establishment of an ICAO register for AMHS addressing scheme and PRMD-name value. In order to facilitate the orderly, systematic and worldwide implementation of the AMHS ICAO had taken action in establishing registers for management domains (MDs) and addressing schemes.

3.9 In order to facilitate the development of AMHS addressing scheme and to provide PRMD value, this issue was discussed at the ATN Seminar held in Chiang Mai, Thailand in February 2004. The meeting noted that the response to the ICAO State Letter of 30 May 2003 was not satisfactory and since it was an important matter to have the address developed well before the AMHS implementation in the region. Since Hong Kong, China had done a lot of work in this area, the CNS/MET SG/8 meeting requested Hong Kong, China to develop a comprehensive list of AMHS addressing and PRMD value for all the States in ASIA/PAC region with options of both the XF and CAAS schemes and present it to the ATN Working Group Meeting to be held in Bangkok from 13-17 September 2004 for review and comments. It was also agreed to request ICAO to provide the list to States for consideration and appropriate action. The meeting formulated the following Draft Conclusion:

Draft Conclusion 8/2 – Development of AMHS Addressing Scheme and PRMD value for ASIA/PAC region

That,

i) Hong Kong, China be requested to develop a comprehensive draft of the AMHS Addressing Scheme and PRMD value for each State in the ASIA/PAC region with options of both XF and CAAS address and present it to the ATN Transition Task Force Working Group Meeting in September for review and comments; and

ii) ICAO be requested to circulate the addressing scheme to States for consideration.

AMHS Naming Registration Form

3.10 The meeting reviewed the AMHS Naming Registration Form developed by the Task Force. It was considered necessary to develop an AMHS Naming Registration Form for registration of essential information of network service access point (NSAP) address of each AMHS and contact point for coordination. As result of review, the meeting agreed to the proposed structure of the registration forms as shown in the Appendix C to this report for adoption. It was also agreed that Hong Kong, China, Japan and USA would use the forms for trial and report back to the ATN Transition Task Force of any difficulties and deficiencies in their use. The registration form will be used for registration of AMHS Names within the Region. These forms will form the basis for documenting States' AMHS naming conventions and selected AMHS names for ATN communications within the ASIA/PAC region. Accordingly, the meeting formulated the following Draft Conclusion:

Draft Conclusion 8/3 – AMHS Naming Registration Form

That, the AMHS Naming Registration Form provided in Appendix C be adopted and circulated to States.

AMHS over TCP/IP

3.11 The meeting recalled that at the Fifth Meeting of the Task Force held in 2003, it was recommended that if administrations within the ASIA/PAC region wish to pursue the implementation of the TCP/IP subnet as part of the ATN, they should be able to do so through bilateral agreements on the understanding that they may be required to make changes to their subnets if and when the TCP/IP subnet is developed as part of the ATN SARPs.

3.12 In view of the foregoing and also considering the action taken in the EUR region to use TCP/IP protocol for initial implementation of AMHS as a transition mechanism to enable AMHS operations to commence ahead of the eventual SARPs compliant data transmission system as an interim local solution, the meeting endorsed the following Draft Conclusion:

Draft Conclusion 8/4 -Use of AMHS over TCP/IP in the ASIA/PAC region

That, Administrations within the ASIA/PAC region willing to pursue the implementation of the TCP/IP subnet as part of ATN may do so on a bilateral basis on the understanding that they may be required to make changes to their subnet if and when the TCP/IP is developed as a part of the ATN SARPS.

ASIA/PAC ATN Performance Document

3.13 It was noted that the ATN Transition Task Force (ATNTTF) has been assigned a number of tasks to assist States for the implementation of ATN. One of the specific action items was to develop documentation on the ATN Performance. The Task Force developed the ATN Performance Document, However, considering that the RCP requirements as described in the document also included air-ground communication aspect and there was a need for input from the ATM community. The meeting, therefore, noted further that works relating RCP was being addressed by OPLINK Panel and RCP Manual was being developed. In view of the task undertaken by OPLINK Panel, Japan was requested to refer the ATN Performance Document to OPLINK Panel for comment and provide the resulting comment to the next Task Force Meeting.

ASIA/PAC Regional ATN Implementation System Management Operational Procedures

3.14 The meeting noted that the document on the system management for transition guidance developed by ATNTTF. The document is intended to provide initial direction and guidance in the identification, development, and selection of ATN administrative management tools, agreements and documents necessary to facilitate and continue operation required for transition from current systems to the ATN. The document also provides samples for service level agreements and Technical Memorandum of Cooperation.

3.15 Accordingly, the meeting endorsed the following Draft Conclusion:

Draft Conclusion 8/5 – ASIA/PAC Regional ATN Implementation System Management Operational Procedures

That, the ASIA/PAC Regional ATN Implementation System Management Operational Procedures provided in Appendix D be adopted and circulated to States to assist in implementation of the ATN ground infrastructure in the ASIA/PAC region.

Table CNS-1D - ATS Inter-facility Data Communication (AIDC)

3.16 With a view to improve presentation of requirements, the existing sample Table CNS-1D provided in ASIA/PAC FASID, Part IV CNS, was modified. The proposed format was reviewed and adopted which would also allow AIDC to operate over AMHS where operationally required and considered cost effective, during initial implementation of AMHS.

3.17 It was noted that there were three options available for implementation of AIDC as follows:

1) Existing AIDC over AFTN;
2) Existing AIDC over AFTN/AMHS; and
3) Fully ATN compliant AIDC

3.18 It was also noted that the AFTN based AIDC when implemented using a multiplexing technique sharing the single communication line for both AFTN/AMHS gateway and AIDC rather than establishing a link through AFTN/ATN gateway and router, it would meet the requirements. If AFTN based AIDC is implemented through AFTN/ATN gateway, it will have impact on the efficiency of AIDC communication in terms of reliability and response time required for AIDC communication. States are expected to take into account the foregoing considerations while planning implementation of AIDC.

3.19 The meeting noted that the format of the Table CNS-1D was reviewed by the ATM/AIS/SAR SG/14 meeting. The review did not result in any comment. As this co-ordination task was completed, the Draft Conclusion was modified for adoption as follows:

Draft Conclusion 8/6 – Table CNS-1D - AIDC

That,

a) ICAO be requested to circulate Table CNS-1D provided in Appendix E to States to specify operational requirements for AIDC; and
b) provide results of the consultation to the next meeting of the ATN Transition Task Force.

3.20 The meeting noted experience of Japan with regard to the operation of AFTN based AIDC service between Oakland ARTCC and Tokyo ACC. The methodology for monitoring the performance of AIDC was also noted. A need to standardize the methodology for monitoring of AIDC performance with respect to infrastructure, system capability, error rate, outages etc. were also identified by Japan.

3.21 The meeting noted that the ATNTTF was developing an ICD for ATN based AIDC while the AFTN based AIDC has been implemented, where required. The ATN/AIDC would eventually replace the AFTN based AIDC. However, it was felt that there may be a need for co-ordination between the AIDC Task Force and ATNTTF to plan transition. The meeting, therefore, agreed that one of the two Task Forces could take initiative and arrange co-ordination meeting as and when required.

ATS Message Handling Service (ATSMHS)

3.22 The meeting reviewed the Table CNS-1C – ATSMHS Plan. It was agreed that the existing sample Table CNS-1C provided in ASIA/PAC FASID, Part IV CNS, should be replaced with completed Table CNS-1C provided in Appendix F.

In view of the foregoing, the meeting endorsed the following Draft Conclusion:

Draft Conclusion 8/7 – Amendment Table CNS-1C – ATSMHS Implementation Plan

That, the sample Table CNS-1C – ATSMHS Implementation Plan provided in ASIA/PAC FASID, Part IV CNS be replaced with the Table CNS-1C shown in Appendix F through the established procedure.

ATN Router Plan

3.23 The meeting noted that Table CNS-1B-ATN Router Plan had already been reflected in the ASIA/PAC FASID. It was noted that the Task Force had reviewed various requirements and target dates of implementation of recommended facilities contained in the plan. The proposed amendment included the Router Plan recommended for Apia, Samoa to be directly connected to New Zealand; intra-domain links and updated the target dates. The meeting agreed that the existing Table CNS-1B should be replaced with an updated Table provided in Appendix G and endorsed the following Draft Conclusion.

Draft Conclusion 8/8 – Amendment to Table CNS-1B – ATN Router Plan

That, the existing Table CNS-1B provided in ASIA/PAC FASID, Part IV CNS be replaced with an updated Table contained in Appendix G.

ATN Implementation/Operational Activities and Issues

3.24 It was noted that Japan and the United States conducted technical and pre-operational trials involving ATN router AFTN/AMSH Gateway and ATSAMHS application. Upon successful tests, transition activities to AMHS progressed using a 64 Kbps link. During the AMHS trials, it was recognized that there was a need to make some modification to the addressing scheme. After resolution of the problem, the AMHS is expected to be implemented by August 2004 and will carry AFTN messages between Japan and USA.

3.25 It was also noted that Australia is replacing its AFTN switch which is providing three different kind of data communication services such as AFTN, OPMET Data Bank and AIS services. It is expected to award contract for the supply of AMHS by December 2004. The AMHS is expected to be implemented by 2005 or early 2006.

3.26 The meeting noted Mongolia's communication infrastructure development programme and various phases of implementation of facilities. The ground-to-ground communication within Mongolia utilize VSAT link using X.25 and frame relay. VSAT link is used for AFS communication with China and a fiber optic cable used to support AFS communication with the

Russian Federation. The fiber optic system will be upgraded to high speed and high capacity link by the end of 2004. The existing system and network will be progressively upgraded by 2006 and the facilities will also be implemented in different phases during the period 2005-2010. Mongolia has implemented FANS-1/A ATM workstation and is conducting ADS-B trials using VDL Mode-4.

3.27 Mongolia has been conducting AMHS trials with Thailand and adjacent States and plans to implement AMHS by the end of 2005.

3.28 Hong Kong, China informed the meeting that the first ATN link in the region - a 64 Kbps circuit between Hong Kong and Bangkok has been put into operation in June 2004. It was also informed that AMHS training at Hong Kong CAD training centre is now available.

AFTN Plan

3.29 The AFTN Plan Table CNS-1A was reviewed and the status of implementation of AFTN circuits was updated. The updated Table is provided in Appendix H. The main highlights of AFTN implementation made during 2003 and early 2004 were as follows:

3.30 AFTN Circuits

- Bangkok/Singapore 2400 bps AFTN circuit was upgraded to 9600 bps on 13 May 2004;
- The Brisbane/Johannesburg 64 Kbps inter-regional AFTN circuit was implemented to function as AF1/ASIA-PAC entry/exit point;
- The Dhaka/Kolkata circuit was implemented using 64 Kbps signaling speed;
- The Guangzhou/Hanoi 2400 bps circuit was implemented;
- The Karachi/Mumbai circuit was upgraded from 200 baud to 2400 bps;
- The Manila/Taibei circuit was upgraded to 300 baud;
- The Mumbai/Paro AFTN circuit was implemented;
- The Beijing/Yangon 300 baud circuit was implemented;
- The Apia/Christchurch 2400 bps was established; and
- The Christchurch/USA 9600 bps AFTN circuit was established.

3.31 The meeting proposed to replace the existing Table CNS-1A in Part IV CNS of the ASIA/PAC FASID with an updated Table reflecting, among others, details the above changes and formulated the following Draft Conclusion.

Draft Conclusion 8/9 – Amendment of the Table CNS-1A – AFTN Plan

That, the Table CNS-1A – AFTN Plan and Chart CNS-1 reflected in Part IV CNS of the ASIA/PAC FASID be replaced with an updated Plan provided in Appendix H in accordance with established procedure.

AFTN Circuit Loading Statistics

3.32 A methodology for calculation of AFTN circuit loading statistics for circuit operating at 9600 bps and 64 Kbps using X.25 protocol was developed. It was agreed to include the figures for the maximum number of byte per hour and maximum number of byte per day in the existing methodology as the existing guidance provides formula for calculating loading on circuits operating up to 2400 bps.

3.33 The meeting agreed to add a Table to indicate the maximum number of bytes that can be transmitted or received for each X.25 circuits including protocol overhead in the existing guidelines contained in Attachment A to ASIA/PAC FASID Part IV CNS as follows:

Signaling	Maximum Number of bytes per hour	Maximum Number of bytes per day
9600 bps	4,320,000	103,680,000
64 Kbps	28,800,000	691,200,000

3.34 The meeting endorsed the following Draft Conclusion:

Draft Conclusion 8/10 – Procedure for calculation of AFTN Circuit Loading Statistics

That, the guidelines for calculation of AFTN circuit loading statistics contained in Attachment A to ASIA/PAC FASID Part IV CNS be amended to add the maximum number of bytes transmitted/received on 9600 bps and 64 Kbps, X.25, AFTN circuits.

Upgrading of the Tokyo/Moscow AFTN Circuit

3.35 It was noted that Japan had recognized the need for upgrading the Tokyo/Moscow inter-regional circuit from 200 baud to 2400 bps as the circuit loading continued to exceed the occupancy level to 70% in peak hour. Japan considered that even if the proposal made by Russian Federation to change routing of some traffic via the Tokyo/Khabarovsk AFTN circuit is accepted, the occupancy level on the Tokyo/Moscow circuit would still far exceed the established occupancy level of 40%.

3.36 The meeting also noted that Japan had provided a working paper through ICAO Regional Office for presentation at the EUR AFSG/7 meeting held in Paris from 19 to 23 April 2004. The paper was presented at the EUR AFSG/7 Meeting. It was further noted that the EUR AFSG/7 had recognized that the issue should be further discussed on a bi-lateral basis to work out mutually acceptable solution. Secretariat informed the meeting that Japan would be invited to attend EUR AFSG/8 meeting to be held in April 2005 to further discuss this issue.

3.37 It was noted that Japan had informed the Russian Federation that the solution proposed for splitting the routing will not resolve problem and that circuit needs to be upgraded. It was further noted that Japan would study an alternate solution, if the proposed upgrading of the Tokyo/Moscow circuit does not materialize.

Relocation of Tokyo AFTN COM Centre

3.38 Japan informed the meeting that the Tokyo AFTN COM Centre is planned to be shifted to Fukuoka where ATM Center will be established by JCAB in October 2005. The Tokyo AFTN COM Centre will be relocated at Fukuoka on 16 February 2006 and the AFTN address will be RJJJYFYX.

Changes in Location Indicator in Indonesia

3.39 It was noted that Indonesia provided to the Task Force details of the changes in location indicator as a result of change in FIR from four to two which will be effective from April 2005. In the Makassar FIR in eastern part of Indonesia, there will be one communication centre at Makassar, 12 Sub-communication centres and 16 Tributary communication centres. In addition, voice communication services will be provided at 170 different airports using HF Single Side Band (SSB) voice communication link.

3.40 Likewise, under Jakarta FIR in the western part of Indonesia, there will be a communication centre at Jakarta, 9 Sub-communication centres, 16 Tributary communication centre and at 57 airports HF SSB voice communication link will be provided.

3.41 The above changes resulted in a complete re-organization of the location indicators which will be effective from 29th September 2004. In order to provide early notification of the changes in Location Indicators, an Aeronautical Information Circular (AIC No. 01) was published on 1 April 2004.

Improved Connectivities for Data and Voice Communication in India

3.42 The meeting noted that India is in a process of providing primarily end-to-end Optic Fibre Cable (OFC) links for data and voice communication within the country and with neighbouring countries. Where OFC is not feasible or cost effective the Airports Authority of India (AAI) would provide VSAT link.

3.43 The AAI has also planned to connect all Indian airports using VSAT link through dedicated satellite networks. A total number of 81 VSAT terminals are proposed to be installed by the end of 2004.

Delivery of AFTN Traffic to Pacific Island States via the Internet

3.44 The meeting noted that the United States plan to provide Federal States of Micronesia, Republic of Palau and Marshall Islands AFTN link through Aeronautical Information System Replacement (AISR) via public internet. These States have very low volume of AFTN traffic. When questioned by IATA, it was stated that higher volume of traffic could be achieved without difficulty. AISR users require only a workstation, modem, printer and operating system, approved browser software and access to internet. The security is assured through the use of dual firewalls, using Public Key Infrastructure Certificate and issuing user identification and password. The implementation is expected to take place during the fourth quarter of 2004.

Subject/Tasks List of the ATN Transition Task Force

3.45 The meeting reviewed the Terms of Reference and Subject/Tasks List of the Task Force, taking note of the relevant items of the Key Priority for the CNS/ATM Implementation approved by APANPIRG/14. The meeting did not feel the need to propose any change to the Terms of Reference.

3.46 The meeting noted the updated Subject/Tasks List of the Task Force and endorsed the Draft Decision as follows:

Draft Decision 8/11 – Subject/Tasks List of the ATN Transition Task Force

That, the updated Subject/Tasks List of the ATN Transition Task Force provided in Appendix I be adopted.

Proposal for a new Task

3.47 The meeting identified the need to define ATN/AMHS performance characteristics to assist States in the development of required specifications for equipment and to establish a sun set date for AFTN to be reflected in Part IV, CNS of ASIA/PAC FASID. The meeting, therefore, proposed that the ATNTTF be tasked to undertaken the above tasks and formulated the following Draft Decision:

Draft Decision 8/12 – Assignment of a new Task

That, the ATN Transition Task Force be tasked to:

i) develop ATN/AMHS performance characteristics as soon as possible to meet the target date of implementation of 2005; and

ii) establish a sunset date for AFTN service to be reflected in Part IV of the ASIA/PAC FASID.

Next meeting of the ATN Transition Task Force

3.48 China offered to host the Seventh Meeting of the ATN Transition Task Force in Shanghai in April 2005. The exact date of the meeting will be coordinated with China and all the members of the Task Force will be notified accordingly by the Secretariat.

Agenda Item 4: Aeronautical Mobile Service:

1) review operation of CPDLC;
2) review result of AN-Conf/11 on Agenda Item 7

Regional Strategy for the implementation of AMS communications data links

4.1 Prior to the 11th Air Navigation Conference APANPIRG/14 had endorsed the statement that the within the region VHF voice communications could be satisfactorily using 25 kHz channel spacing. For voice communication, the use of 25 kHz channel spacing complies with ICAO Standards and provides for interoperability with aircraft from other regions. Aircraft from the ASIA/PAC region operating into other regions would have to be suitability equipped for the use of 8.33 kHz channel spacing for operation into certain parts of the European region.

4.2 Hong Kong China provided an example to the meeting on the use of data communications in place of voice. The examples quote were the use of D-VOLMET and D-ATIS.

4.3 The meeting was informed that there was a lack of guidance available for the deployment of data communications and that current implementations of data link did not conform to ICAO standards. Although it did provide satisfactory service for the current applications, the technology being used will face limitations in the future.

4.4 The ASIA/PAC region has in place strategies to guide States in the selection and implementation of CNS applications. The GNSS Implementation Strategy, the Strategy for Approach, Landing Guidance, the selection of 1090 MHz extended squitter were noted as existing strategies. These strategies were considered to be of value to States in planning and implementation. The meeting considered it necessary to develop a corresponding strategy for the selection and implementation of an AMS communications data link. Due to lack of sufficient information available at the meeting, it was decided that it would be more appropriate to develop such strategy for the selection of a suitable data link at the next meeting of the Sub Group (CNS/MET SG/9). A Working Group was established to conduct appropriate consultations, identify factual information and to develop a strategy. Accordingly the meeting formulated following Decision:

Decision 8/13 - Development of a Regional Strategy for the implementation of AMS communications data links

That, a Working Group be established to develop regional strategy for the implementation of AMS communications data link and that, the strategy be available for consideration at the CNS/MET SG/9 Meeting.

Note: *Details of the TOR, membership, working method and Rapporteur of the Working Group are contained in the Appendix J to this report on Agenda Item 4.*

VHF coverage in Indian airspace

4.5 India updated the information on the improvement and enhancement of VHF coverage in Indian airspace in the Oceanic region.

4.5.1 To enhance the ACC coverage of over Bay of Bengal in Indian Airspace RCAG VHF stations at Vishakapatanam and Port Blair controlled by both Chennai and Kolkata and RCAG/VSAT(s) at Bhubaneswar controlled by Kolkata have already been operational. The ACC VHF coverage of Mumbai and Trivandrum airports over Arabian Sea has been enhanced by RCAG/VSAT at Agatti.

4.5.2 To ensure further improvement, AAI has a plan to deploy high power VHF transmitter with directional antenna at Chennai and Port Blair and High power VHF Transmitters at Kolkata and Vishakapatanam. Once implemented, the Indian Airspace over Bay of Bengal is expected to be covered by VHF communication. The coverage of Delhi ACC has been enhanced by installing RCAG/VSAT at Khajuraho. RCAG at Porbandar controlled from Mumbai airport has been established to enhance the ACC VHF coverage. Similarly, Chennai ACC VHF coverage has been improved by putting RCAG at Bangalore.

4.5.3 AAI has a plan to implement RCAGs at the various locations to provide full VHF coverage over Indian airspace. These stations are proposed to be operated on OFC/VSAT links.

4.6 The meeting congratulated India for improvement made in VHF air/ground voice communication over Bay of Bengal area and in the Indian ocean area.

4.7 It was pointed out that necessary coordination process would be required for frequencies used at RCAG stations even if such frequencies had been coordinated earlier for use for lower coverage. These radio frequencies operating at RCAGs may cause interference to neighboring ACCs which have been operating on the same frequencies. It was agreed that while enhancing the VHF coverage consideration should be given to ensure that the enhance coverage does not interference to other facilities.

Report and analysis of ADS/CPDLC problems

4.8 Australia presented an information paper on delayed data messages from aircraft experienced in Australian airspace. The ADS-C has been used by Australian air traffic controllers for surveillance outside radar coverage since the transition to TAAATS (The Advanced Australian Air Traffic System) since 1999. The paper analyzed all ADS-C reports received by Brisbane (YBBB) and Melbourne (YMMM) Centres over a six month period on a month by month basis. This analysis involved determining the transmission delay for each ADS-C basic report. The information was provided to the FANS Implementation Team, Central Reporting Agency and CRA determined that there was certain equipment from a specific avionics manufacturer that was common to the aircraft types suffering these problems. It appears that the problem relates to the transition of the aircraft from one satellite “spot beam” to another. This problem causes the avionics to “buffer” data link downlink messages (ADS-C & CPDLC), and to transmit the contents of the buffer at a later time. Data link uplink messages appear to be unaffected by this problem. The geometry of how these spot beams overlap explains why the problem is sometimes “direction specific”.

4.9 The meeting noted the cooperation between Australia and the FIT CRA in addressing the problem and suggested the information should be shared with the FITs supporting the Bay of Bengal and South China Sea if not already done so.

4.10 The meeting also noted the IATA position on aeronautical air-ground communications needs, which was presented to AN-Conf/11 on agenda item 7.

Result of AN Conf/11 on Agenda Item 7

4.11 Under this Agenda Item, the meeting reviewed the outcome of the Eleventh Air Navigation Conference (AN-Conf/11) on Agenda Item 7. Action taken by the ANC and Council on the Recommendations developed by the Conference were also noted.

4.12 The meeting noted that some elements for future air-ground communications identified by the AN-Conf/11 could form the basis for a broad consensus on an evolutionary approach for global interoperability, as laid out in Recommendation 7/3. Conference endorsed the global ATM operational concept. It was noted that ICAO, States and PIRGs should develop strategies for the implementation of ATM systems based on the global ATM operational concept. Recommendation 7/7 endorsed an

evolutionary approach for global interoperability of air-ground communications based on the continued use of implemented ICAO standardised voice and data communications whilst these systems remained operational viable, economical and safe. It was recognized that efforts should be made to maximise the efficient use of spectrum. Progressive deployment of data communication on the basis of applicable ICAO Standards should be undertaken with a view to complementing or replacing voice communications for most routine communications.

Agenda Item 5: Radio Navigation Aids:

1) review strategies for Precision Approach and Landing Guidance Systems and GNSS Implementation;
2) review result of AN-Conf/11 on Agenda Item 6.

Regional Strategies

5.1 The regional strategies for implementation of GNSS and the provision of precision approach and landing guidance systems were last reviewed and updated by the Seventh Meeting of CNS/MET Sub-Group in July 2003. Subsequently, APPANIRG/14 adopted the strategies in its Conclusion 14/19.

5.2 The meeting noted recommendations of AN-Conf/11 and also additional information provided by States. An ad-hoc group was established to review both of the regional strategies. The revised strategies developed by the meeting are presented in Appendices K and L The meeting noted that the strategies were generally consistent with the conference recommendations and minor changes were required. The revisions to the strategies included the refinement of implementation dates and the provision of approach with vertical guidance (AVP).

5.3 The meeting formulated the following Draft Conclusion for adoption of the changes proposed as follows:

Draft Conclusion 8/14 - Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region

That, the updated Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region provided in Appendices K and L respectively, to the report on Agenda Item 5 be adopted and provided to States.

Transition Planning

5.4 Australia presented information on the revision of navigation services. Navigation Services are addressed in an ATM Strategic Plan that has been prepared by ASTRA group (www.astra.aero). The ASTRA group is a collaboration of aviation stakeholders representing government, airlines, airports and service providers. The information provided by Australia described the general direction to be taken with the provision of navigation services and also advised that Australia would be making a submission to revise the current entries in the FASID to reflect Australia's current intent.

5.5 Australia intends to transition to a sole means GNSS navigation capability. The transition is to be achieved in phases based on Oceanic and Enroute, Terminal and Non Precision Approach and Precision Approach. Transition to Sole Means GNSS with Airborne Augmentation for oceanic and enroute navigation is planned by 2010. For sole source Terminal and Non Precision Approach navigation for certain classes of aircraft and operation such as domestic General Aviation and lower capacity Regional and Charter aircraft by 2010 and GNSS with airborne augmentation for primary means Terminal and Non Precision Approach navigation, with a network of conventional navigation aids to provide an alternative means of Terminal and Non Precision Approach Navigation for Air Transport and larger Regional and Charter aircraft by 2010. The use of the Instrument Landing System will continue to provide Precision Approach Category I. A close watch is maintained in the development on the Ground Based Augmentation System which is expected to be deployed at major

aerodromes. However, ILS is expected to be retained on some runway ends as a backup until 2020. The possible use of APV as a Precision Approach capability is currently being explored with due consideration of safety of flight, technical, operational and economic factors. No decision to adopt APV has been taken.

5.6 During the transition phases there will be a rationalization of NDB and VOR whilst maintaining and in some cases refurbishing NDB and VOR facilities in order to provide a network of conventional navaids as an alternative means of navigation.

5.7 The Australian paper emphasized the importance of collaborative planning with stakeholders and urged other States to consider a similar process and to achieve regional coordination through maintaining entries in the FASID.

5.8 IATA provided to the meeting two papers recently presented to the Navigation Systems Panel on the subjects of 'IATA Policy and Position on Navigation' and 'Decommissioning of Ground-Based Navigations Aids'.

Regional Navigation Study

5.9 The United States of America provided information on a regional navigation study being performed for the APEC GNSS Implementation Team (GIT) by The MITRE Corporation and sponsored by the U.S. Trade Development Agency (US TDA). The intent of the Asia-Pacific Regional Navigation Feasibility Study (ARNFS) is to provide the guiding principles, managerial guidelines and a technical roadmap for CNS/ATM implementation and transition efforts over the period 2003-2013 for the participating economies and to complement ICAO's plans and requirements for the ASIA/PAC region. The study is to concentrate primarily on the navigational areas and integration of navigation components in CNS/ATM technologies. In addition, as part of the implementation effort, the study will identify possible sources of potential funding for implementation. The study should be completed in early 2005 and the report will become a publicly available document.

Navigation System Panel

5.10 Australia informed the meeting of activities undertaken by the Navigation Systems Panel (NSP) at its recent meeting held in St. Petersburg that were relevant to regional planning. Activities relevant to regional planning were as follows:

- GNSS modernization – GLONASS-K new generation satellite launch program and GPS L1 modernization;
- GRAS – completion of Part A and B SARPs;
- MLS – simplification of SARPs to provide an ILS like coverage;
- DME - wideband DME (DME-W) is proposed for deletion from SARPs;
- ILS – Marker Beacon – proposal or the option of choice between marker beacons or DME;
- Protection Dates – clarification of protection dates; and
- Testing of Radio Navigation Aids – completion of testing guidance for SBAS.

FASID – Table CNS-3

5.11 The meeting considered a proposal made by Australia of its intention to submit changes to the FASID Table CNS-3. It was also pointed out that in accordance with the Key Priority item regarding "Incorporation of CNS/ATM Material into Regional ANP & FASID". The need to the conduct a short review of the Table CNS-3 was also recognized. It was observed that the entries of many States were either out of date or lack adequate information. The meeting considered it desirable that the information in the FASID should be comprehensive and current in order to facilitate regional planning and coordination. As an outcome discussion the meeting formulated the following Draft Conclusion:

Draft Conclusion 8/15 - Revision of FASID Table CNS-3 by States

That, States review and revise FASID Table CNS-3 to indicate comprehensive descriptions of the future provision of radio navigation aids and that the revised entries be provided to the Regional Office by the end of May 2005.

Space Based Augmentation Systems

5.12 The United States provided a status report on the Wide Area Augmentation System (WAAS). The WAAS was commissioning on 10 July 2003 for use in all phases of air navigation in the United States. After an extensive testing and assessment programme WAAS performance consistently demonstrates 1 m horizontal and 1.5 m vertical accuracy. WAAS IOC provides users with the capability to fly approaches with vertical guidance throughout the U.S. NAS. At commissioning, over 500 LNAV/VNAV procedures were published. The WAAS service area is the continental United States and portions of Alaska. FAA also improved the precision approach capability provided by WAAS through terminal approach procedures (TERPS) optimization. This improvement takes full advantage of the capabilities of the WAAS Signal-in-Space and provides a new approach procedure with vertical guidance called LPV. LPV provides more lateral precision over LNAV/VNAV resulting in lower approach minima for most runways. LPV procedures have nominal minimums of a 250 ft. decision height, ¾ mile visibility without proper lighting (½ mile visibility with proper lighting), 40m HAL, and 50m VAL.

5.13 The FAA's goal is to have additional GEOs (at least one) on orbit by 2006/07. Beyond this time frame, the FAA will continue to develop a GEO constellation sustainment strategy to ensure the required redundancy in WAAS broadcast over the U.S. National Airspace. WAAS development of full LPV capability in the United States is scheduled to be completed in 2008. At this time, the U.S. Government schedule to incorporate a second civil frequency (L5 at 1176.45 MHz) on GPS satellites will be more solidified. When available for use, WAAS will incorporate L5 into its operation to upgrade the LPV capability to a GPS Landing System (GLS) capability. GLS is the Category I precision approach equivalent for GPS systems with aviation minimums of 200 ft. decision height and ½ mile visibility (with proper lighting).

5.14 The United States informed the meeting that the LAAS CAT I Certification is expected in 2009. It was also stated that the LAAS FOC will be realized in 2013. It is required to await availability of L5 signal.

5.15 The United States also informed the meeting that Galileo will be a inter-operateable system with the GPS.

Results of AN-Conf/11 on Agenda Item 6

5.16 The meeting was noted outcome of discussions on Agenda Item 6 of AN-Conf/11 on navigation issues. Following the review of information on GNSS development presented by States and satellite navigation service providers, the Conference made Recommendation 6/1 for transition to satellite-based air navigation, which encouraged further steps in using GNSS technology. The Conference stressed the importance of satellite-based augmentation system (SBAS) capability, which could be provided in three large areas of the world in the near term and would enable approach procedures with vertical guidance (APV).

5.17 The Conference reviewed the results of GNSS vulnerability studies and concluded that, to date, no vulnerabilities had been identified that compromised the ultimate goal of transition to GNSS as a global system for all phases of flight. Having agreed to Recommendation 6/2 concerning mitigation of GNSS vulnerabilities and Recommendations 6/12 and 6/13 concerning the use of new GNSS elements and signals, the Conference, however, recognized that uncertainties would remain

regarding the use of satellite navigation service as a sole navigation service and that studies in this area of concern should continue.

5.18 The Conference identified a number of tasks to be addressed in the future development of aeronautical navigation services and, consequently, made a number of recommendations on actions to be taken by air navigation Panels and Study Groups.

5.19 The Conference also reviewed the information presented on experience gained in States with the introduction of GNSS operations, including the results of SBAS test bed trials. Recommendation 6/9 encouraged cooperation of States and service providers, and support of service providers to activities leading to the extension of SBAS service areas into neighboring States and regions.

5.20 The Conference made Recommendation 6/10 for updates to the ICAO strategy for non-visual aids to approach and landing in Annex 10, and adopted Recommendation 6/11 for amendments to the Global Plan. Both documents, as amended by the Conference, would provide general guidance to PIRGs, States, service providers and users in their planning of air navigation services for a foreseeable future.

Agenda Item 6: Surveillance:

1) review report of Second ADS-B Study and Implementation Task Force;
2) review surveillance system

AN-Conf/11 on ADS-B

6.1 The meeting reviewed result of the AN-Conf/11 with respect to ADS-B. The Meeting noted each item of Recommendations 1/6, 1/7, 4/1, 7/1, and 7/2 related to ADS-B formulated by the AN-Conf/11. The meeting also noted that the ANC had approved Recommendations 7/1 and 7/2 relating to strategy for the near-term introduction of ADS-B and support of longer term ADS-B requirements that were in line with the conclusions formulated by the first meeting of the Task Force.

6.2 The meeting noted specific items of Recommendations 1/7, 4/1 and 7/1 of AN-Conf/11 that were assigned to States/ICAO/PIRGs for initial follow-up actions to ensure implementation of harmonized, compatible and interoperable ADS-B system with respect to operational procedures, supporting data links and ATM applications. The meeting also noted that 1090 MHz extended squitter which had been selected as the regional choice for the implementation of ADS-B in ASIA/PAC region for the near term had also been endorsed by the AN-Conf/11 for global application.

ADS-B study and Implementation Task Force

6.3 The meeting reviewed the report of the Second Meeting of ADS-B Study and Implementation Task Force which was held from 22 to 26 March 2004 in Bangkok.

Trials, Demonstration and project of ADS-B conducted by States

Australia

6.4 The meeting noted the status of the operational trial conducted in airspace surrounding Bundaberg, Queensland approximately 300 km north of Brisbane. The ADS-B ground station located near Bundaberg has been operating since June 2002. Nine aircraft that regularly operate in the Bundaberg region, including 4 regional airliners have been fitted with ADS-B avionics. An additional 3 aircraft are expected to join the trial fleet this year. ADS-B processing and display functions have been fully integrated into The Australian Advanced Air Traffic System and the operational implementation process has commenced.

ADS-B Upper Airspace Project (UAP)

6.5 It was noted that Airservices Australia had made progress in the ADS-B upper airspace project. The objective of the project is to provide additional safety benefits for equipped aircraft. It will also maximise operational flexibility for equipped airlines. Acquisition of the ADS-B ground stations through competitive tender processes has been completed. Taking into account the desires of Industry to minimise coverage gaps above Flight Level (FL) 300 Airservices Australia has purchased 27 ADS-B ground stations for use above FL 300 and 2 additional ground stations supporting airspace below FL 300. Each ground station comprises two antennas, two receivers and two site monitors. The site monitors provide assurance that transmitted signals are being received by the ground station and include a monitoring capability of positional data integrity as well. Two integrated GPS receivers at each site provide time tagging and information regarding GPS constellation status. A software development environment was included in the acquisition package. Each site is expected to have coverage up to 250 NM. All installations will occur at locations at which Airservices Australia already has VHF communications – which are being upgraded under a separate VHF replacement project. In fact ADS-B radios will be installed during the same site visit to install

new VHF radios. The first ground station will be tested in Brisbane at the end of 2004. All subsequent ground stations will be delivered mid 2005 and are expected to be operating by the end of 2005.

ADS-B Lower Airspace Project (LAP)

6.6 It was noted that Airservices Australia is examining the possible deployment of an additional network of ADS-B ground stations for lower airspace. Two duplicated ADS-B ground stations have been purchased to be deployed to primarily support surveillance in lower level airspace. Aircraft above FL 300 will also be supported by these sites. Airservices Australia is working with a number of vendors to demonstrate low cost avionics.

Australian Strategic Plan and ADS-B Implementation Team

6.7 The second version of the Australian Strategic Plan was signed in 2003. The signatories to this plan include: Qantas, Australian Department of Transport, Virgin Airways, Australian Airports Association, CASA, Alliance Airways, AOPA, Coastwatch, RAPAC, GAPAN, and Defense. This plan is available at http://www.astra.aero. ADS-B is considered by ASTRA to be a key enabler to achieving the operational concept. An ATM Strategic Planning Forum held in September 2003 reinforced ASTRA's central role in coordinating the implementation of the Australian ATM Strategic Plan and accordingly, established three dedicated Implementation Teams – the Operational Strategies Implementation Team, the ADS-B Implementation Team (ABIT) and the GNSS Implementation Team. The objective of the ABIT is to support ADS-B deployment in Australia. ABIT is responsible for ensuring that the diverse elements of ADS-B deployment proceed in a timely manner, through coordination and sharing of experience between all the stakeholders, across a broad spectrum of the aviation community.

ADS-B instead of Radar & ADS-B mandate

6.8 ADS-B is considered as a viable and economic alternative to existing SSR for enroute surveillance in Australia. The ADS-B UAP will provide ADS-B surveillance service to the airspace users. It was noted that operational priority would be given to those aircraft that have chosen to equip. However, fitment in the low-density airspace will be optional. As existing SSR enroute radars require replacement before 2009, the choices facing Airservices Australia and its users is either to replace these aging radars at a cost exceeding $40M AUD or switch to the less expensive ADS-B technology. It is recognized that cost for avionics fitment is also involved. Recognizing that ADS-B is a key component of the Australian ATM strategic plan, it is likely that aircraft will need to move to ADS-B at some stage. Assuming that the Australian Industry wish to avoid the costs of new radars, and the ongoing high costs to maintain radars, it is envisaged that mandatory fitment and use of ADS-B will be introduced in the medium traffic density enroute airspace of Australia before 2009.

China

6.9 The meeting noted plan for implementation of ADS-B trial in western part of China. SSR Mode-S 1090 ES will be used as the ADS-B link for such trial. Three airports will be included in this trial, two of which are primary sites and one is optional. In addition to performance and parameters of ADS-B equipment such as accuracy, reliability, update rate and coverage, safety and operation evaluation will be also conducted. At the same time, another important work is to evaluate the feasibility using ADS-B in western part of China. Controller training and training to technical staff will be also conducted. To avoid impact to the operation of existing automation system, separate independent automation system will be used in the trial for data collection, analysis, process and comparison of radar information with ADS-B information. This trial will start before the end of 2004. The early date for implementation will be subject to the result of the trial.

Hong Kong, China

6.10 It was informed that Hong Kong, China is conducting ADS-B test for airport surface surveillance function using " ASMGCS" trial system in 2004 and 2005.

India

6.11 It was noted that ADS-B study group was established in India which consisted of air traffic controllers and engineers of Airport Authority of India (AAI) and technical experts from manufacturer was constituted for carrying out a technical study and analysis of various issues pertaining to the implementation of ADS-B in India. The study group, in October 2003, reviewed the current situation of the CNS infrastructure in India including ATS route structure, aircraft movement data, VHF stations, RCAG stations, HFRT stations, surveillance radars and their coverages, details of NDB and DVOR stations, airline operators and their fleet, avionics equipage, etc. Additional data on current status of avionics fitment of the national carriers, current regulations on the mandate to carry Mode S transponders, etc. were also considered by the study group in February 2004. Since the Indian continental airspace is almost covered by radar, ADS-B was be considered as:

- a supplement to fill the gaps which are not covered by radar to enhance surveillance and improve safety;
- a surveillance tool to enhance safety and reduce separation to expedite traffic at remote/secondary airports and to monitor enroute traffic in TMA to improve safety and airspace capacity; and
- support for search and rescue activities.

6.12 As the result of the study, it is expected to identify one suitable site from amongst the three possible sites that have been proposed for installation of ADS- B ground station, in the southern part of the country in Chennai FIR. Existing radar and VHF coverage at various heights, availability of communication links for data transfer, etc will be taken into account for finalizing the site. AAI is planning to purchase a new aircraft for flight calibration purposes, equipped with SSR Mode-S ES for use of ADS-B trial. The ADS-B data will be sent to Chennai ACC through landlines or VSAT and processed separately and presented to the controllers in a separate workstation for trial operations.

Mongolia

6.13 Gradual increase in international traffic using the existing air routes with limited radar coverage will result in a need for increased surveillance capability. The domestic traffic throughout the national network of airports has a need for surveillance coverage to ease up constrains between national and international traffic. In addition, there is a need to enhance the national SAR (search and rescue) capability. FANS ADS-C was introduced a couple of years ago with a good coverage for the international air routes. The results from the simulations proved that the concept fulfilled the required surveillance capability in Mongolian airspace in the foreseen future. To help the validation process and to provide input to the implementation planning, Mongolia has invested in two VDL Mode-4 ground stations and 5 airborne units with CDTI´s (cockpit displays) for domestic operations. The airborne equipment has been installed on 3 AN-24 and 2 MI-8 helicopters. One ground station was installed in Ulaanbaatar and the second ground station was installed in Muren in 2003. Both ground stations are connected to the Ulaanbaatar ATC centre. Since it was supported at the first meeting of the ADS-B Study and Implementation Task Force to use Mode-S ES for international operation in the ASIA/PAC region, Mongolian CAA is also planning to start a trial with Mode-S ES ground station to be installed in Ulaanbaatar. Manufacturers of Mode-S ES general systems are invited to conduct trial in the Mongolian airspace. The trial will be very special since it will include ADS/C, ADS/B over VDL Mode-4 and ADS/B over Mode-S ES into one ATM workstation. Comprehensive comparison between systems can be made during this trial. Mongolia will coordinate with neighbouring States for future implementation of ADS-B to provide a seamless coverage.

Indonesia

6.14 The meeting noted the ADS-B related activities conducted in Indonesia. In July 1998 Indonesia had an experience with VDL Mode-4 prototype system in which the airborne equipment was installed in B200 aircraft and certified by manufacture through Indonesia Directorate of Airworthiness. The SSR Mode S 1090 extended squiter is planned for implementation in Indonesia from 2005 to 2010 time frame in two Phases in non radar environment. In Phase I, 15 ADS-B ground stations will be established at different locations in Eastern part of Indonesia within the Makassar FIR. In phase II, 10 ADS-B ground stations will be established at different locations in the Western part of Indonesia within Jakarta FIR.

Japan

6.15 The meeting noted the activities being undertaken by ADS-B Planning and Implementation Working Group (ADS-B WG), which was established in Japan in July 2000. The WG is composed of JCAB, Electronic Navigation Research Institute (ENRI), JAL, ANA, JAS, Japan Radio Air Navigation Systems Association (JRANSA), Data Link Service Providers, Air Traffic Services (ATS) automation system vendors and ATC related consultants. The main objective of the WG is to formulate implementation plan of ADS-B from both operational and technical perspectives. The current work is to clarify the benefit derived from using ADS-B in Japan. The enhancement of situation awareness of general aviation aircraft flying in the radar blind areas is desired and the use of ADS-B on the aerodrome for surface surveillance in high traffic density airport is highly desired as current airport surface detection equipment (ASDE) has some undetected radar area. In financial year (FY) 2001, the Working Group began to develop a roadmap for implementation of ADS-B, and also developed the concept of Operational Case Study. Electronic Navigation Research Institute (ENRI) has started development of an ADS-B experimental system since FY2001. The transmitter units transmit Mode S and Mode A/C interrogation to improve acquisition at blind area, display aircraft ID and so on. The reference unit transmits squitter signal in order to calibrate time synchronization. A basic test was conducted in Sendai airport area which is about 200 NM northeast of Tokyo. ADS-B avionics installed consist of a Mode S transponder (ACSS XS-950), a Processor unit (UPS-AT AT9051) and a GPS receiver. The flight level was about 10,500ft and the target update rate was one second. The detection probability was 100% on the arc flight, but some lost targets occurred on the outbound and inbound flight. Performance tests for ADS-B and multilateration will be conducted on airport surface and terminal areas from March 2004. Evaluation items will include accuracy, detection probability, report update rate, coverage, etc. The comprehensive evaluation tests will be conducted in FY2005.

USA

6.16 The United States provided details of the ADS-B operational evaluation and implementation activities under FAA Safe Flight-21 (SF-21) and Capstone Programmes. FAA has been developing and conducting technical evaluations of ADS-B technologies since 1992, and has been operationally testing and evaluating ADS-B and related broadcast service technologies since 1998. More recent activities are organized under the SF-21 programme, under a cooperative government/industry effort to develop enhanced capabilities based on the Communication, Navigation and Surveillance (CNS) technologies such as ADS-B, GPS, WAAS, FIS-B, and TIS-B to integrate with enhanced pilot and controller displays. SF-21 will evaluate the safety, efficiency, capacity, service, and procedure improvements these technologies make possible, and will facilitate their certification. It was also noted that the USA is proceeding with a national 3 NM separation analysis, 1090 MHz ADS-B avionics TSO, and continued deployment of ADS-B ground stations (>40) and avionics (additional 300 aircraft). The USA has also observed 1090 ES ADS-B self equipage of national and international air transport category aircraft flying into and around the USA. The USA is proceeding with operational evaluation of these “pockets” of ADS-B technology implementation to enable initial use of ADS-B and stimulate user equipage. These “pockets” of ADS-B technology implementation include: Alaska, Ohio River Valley, East Coast and Gulf of Mexico. The operational

and technical results of these near-term initiatives will be leveraged to support investments and deployments for national use.

6.16.1 In 2004, SF-21 focused considerable effort on securing the documentation necessary for the FAA to make an investment decision. To date, this requirement has centered on reviewing and authenticating the results of previously completed operational evaluations and preparing an initial investment analysis based on deploying ADS-B in three implementation spirals between 2005 and 2016, as follows:

- Spiral One: Fielded in 2005-2008, will provide low altitude broadcast services and a surface management system (SMS) capability. The infrastructure supporting this capability will consist of broadcast services ground stations and broadcast control facilities, which provide the Broadcast Services Manager (BSM) and TIS-B Surveillance Data Processor (TSDP) functions. The ground stations will be located at towered airports and at en route radar sites across the country. The BSMs and TSDPs will be primarily located at the Air Route Traffic Control Centers (ARTCC).

- Spiral Two: Fielded in 2009- 2012, will build on the spiral one architecture by adding additional ground stations that will also be located at towered airports. Additionally, interfaces will be developed with terminal automation systems to support ADS-B based surveillance capability on air traffic automation and support systems including STARS, Common Automated Radar Tracking System (Common ARTS), Automatic Surface Detection Equipment (ASDE), and Enhanced Traffic Management System (ETMS).

- Spiral Three: Fielded in 2013-2016, will not add any additional ground stations, but will provide additional interfaces into en route automation systems (En Route Automation Modernization System (ERAM) and Advanced Technology Oceanic Procedures System (ATOPS) to support ADS-B-based surveillance capability.

6.16.2 Additional digital maps were produced for the Airport Map Database. A total of 82 are now complete, and are being maintained while the database is completed. The Surveillance Branch of the Operational Support Office at the Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma, will produce, maintain and verify this map database. The FAA ADS-B link decision will recognize a national deployment of 900 ADS-B ground based transceivers by 2012. Detailed information on the above developments can be obtained by accessing the following FAA websites:

Capstone Programme: http://www.alaska.faa.gov/capstone/
Safe Flight 21 Programme: http://www.faa.gov/safeflight21/

Boeing ADS-B Capable Transponders

6.17 It was noted that Boeing had been working with airline customers, transponder suppliers, FAA, Eurocontrol, ARINC, ANSPs, and other stakeholders in pursing traffic surveillance upgrades that enhance safety and efficiency. While the major drivers for the recent upgrades have been European Elementary Surveillance (ELS) and Enhanced Surveillance (EHS) programmes, Boeing has taken the ELS/EHS upgrade opportunity to incorporate ADS-B/Mode-S ES in anticipation of upcoming ADS-B requirements. To support ELS and EHS and 1090 ES Boeing has upgraded the aircraft wiring for 737/747/767/777 model aircraft to add new wiring interfaces for FMC, IRU, MCP and MMR data. This upgrade is now complete and is available on every such type of aircraft in production today. It is also available as a customer option on the 717 and 757-airplane model. Boeing is upgrading the Mode-S transponder installation to ARINC 718A compliant transponders. ARINC 718A transponders, which are compliant with ICAO Annex 10, Amendment 77 and are capable of supporting ELS/EHS/ES functions and form a foundation for future Mode-S and ADS-B upgrades. Since ES functionality and certification criteria have not been fully delineated for transponder installations, ES capability is verified for proper operation and non-interference only. In January

2004, Boeing started the certification effort for ARINC 718A configurations. Certification of various transponder configurations is expected to continue.

Update of Airbus ADS-B Implementation

6.18 The meeting noted that Airbus and its Air Traffic Alliance partners support the efforts of the ASIA/PAC region to field new technologies and services based on ADS-B using 1090 ES. The ASIA/PAC live trial has already provided valuable contribution to Airbus engineering. In 2003, Airbus certified Collins, ACSS and Honeywell Mode S Transponders with European Elementary Surveillance (ELS), Enhanced Surveillance (EHS) and 1090 ES ADS-B air-ground surveillance together with wiring provisions to bring the parameters to the transponders. Customers can request these modifications for production aircraft. Service Bulletins are available from Airbus to retrofit these installations on in-service aircraft. Airbus has launched a Mode S transponder enhancement programmes to enable operators to comply with ELS and EHS rules applicable to the airspaces of a number of States in Europe. This upgrade was an opportunity for initial 1090 ES function to be implemented and to install the appropriate aircraft wiring to provide the parameters to the transponder. The Airbus transponder installation is compliant with ICAO SARPS Annex 10 Amendment 77, RTCA DO181B or C, EUROCAE ED73A, and ARINC/AEEC 718A. The ES function is partially compliant with RTCA DO260 and depends on transponder makers.

Development of ADS-B Avionics for General Aviation

6.19 The meeting noted the activities related to the development and demonstration of avionics for general aviation and small regional aircraft being conducted by Australia. The availability of ADS-B products for small regional aircraft and the General Aviation (GA) community is seen as a key activity towards wide scale fitment of ADS-B in the GA fleet. Until this segment of the aviation market is provided with avionics that will support air traffic control (ATC) surveillance, the existing enroute radar network, predominantly paid for by Air Transport Aircraft operators, will have to be maintained. Airservices Australia is therefore involved in a number of projects aimed at encouraging the development of ADS-B avionics for regional aircraft and the GA community. A contract has been established with an Australian avionics manufacturer to develop a prototype Mode A/C transponder capable of transmitting ADS-B messages. CASA has issued an Australian TSO (ATSO) for this device. An agreement is in place with a USA company for the development of a prototype cockpit traffic display based on ADS-B. Discussions are also taking place with European companies for the development of ADS-B cockpit traffic displays. While moving map cockpit displays depicting an aircraft's location in relation to a background map of the terrain are widely available, the part missing for traffic display is the 1090 MHz receiver and a standardised interface between the receiver and cockpit display. It is proposed to arrange demonstrations of cockpit displays for the GA community and regional airlines, to obtain feedback on the applicability and benefits of these devices.

Qantas Equipage Plans

6.20 The meeting noted that the Qantas group of airlines has expressed its support for the deployment of ADS-B as an ATC surveillance tool (ADS-B air-ground surveillance) as well as recognising its potential for airborne surveillance. New jet aircraft received by Qantas will have an ADS-B capability and European requirements for "elementary" and "enhanced" SSR operation offer a convenient opportunity to retrofit the long haul fleet. The meeting noted Qantas serious commitment to ADS-B by equipping several aircraft with ADS-B. It is also planned to make the B747-400 fleet compliant with European Mode-S "enhanced" requirements by 15 March 2005 (bypass the "elementary" stage).

6.21 During the presentation of this information to the meeting, the ADS-B Task Force considered that it would be very beneficial to know the airlines plans to have ADS-B capability. Since IATA is in the best position to conduct a survey and provide the information to the next meeting of the Task Force, the meeting endorsed the following Conclusion formulated the second meeting of the ADS-B Task Force:

Draft Conclusion 8/16 - Airlines plan for the deployment of ADS-B

That, IATA be requested to conduct a survey of its member airlines' plan for the deployment of ADS-B in the ASIA/PAC region and provide result to the next meeting of the ADS-B Task Force or its Working Group.

6.22 The meeting also recognized that there is need to conduct a large-scale survey for deployment plan of those non IATA member airlines, regional carriers as well as those State aircraft. The meeting agreed to refer this suggestion back to the ADS-B Task Force for further consideration.

Industry's Perspective on ADS-B

6.23 The meeting noted that Thales ATM as a ground equipment manufacturer has developed ground infrastructure capabilities to support ADS-B based surveillance, which include ADS-B 1090 ES ground stations and ADS-B reports processing and display capabilities in the EUROCAT air traffic control center system. Within the framework of European Research and Technology programmes, Thales ATM is exploring the operational implementation of ADS-B based applications, addressing applications requirements and procedures, the evolution of ATC ground infrastructure. It was stated that the current status of standards and technology allows the early implementation of the simplest ADS-B applications, which requires minimum modifications on-board aircraft and on ground systems. Such early implementation will pave the way for more advanced applications as aircraft get equipped, while offering operational and safety benefits in the areas of implementation. Therefore, it has included ADS-B technology in its products range to allow implementation of ATC surveillance based on ADS-B.

6.23.1 It was also noted that in the scope of European Research & Development programme NUP Phase 1 (Northern Europe ADS-B Network Update Programme) Thales ATM had developed and delivered 6 VDL Mode 4 based ADS-B Ground Stations, installed in several European countries. This station is capable of receiving ADS-B reports from aircraft and vehicles and also of uplinking traffic data to mobile users to support advanced air-to-air applications. The output format complies with the ASTERIX standard, Category 21.

6.24 The meeting noted the current activities and programmes conducted by Sensis Corporation, which designs & manufactures ADS-B ground station infrastructure. The Burnett Basin ADS-B system is being prepared to be used in an operational environment in April 2004. Controllers in the Brisbane TAAATS Centre now have access to the ADS-B data being received by Sensis Corporation ADS-B Ground Station Units from equipped aircraft operating in and around the Burnett Basin area. It was stated that the trial has proven that ADS-B technology is mature.Tere are currently more than 400 Mode-S ADS-B capable ground stations installed throughout the US and Europe today and testing and evaluation of the system is being undertaken by Hong Kong China.

Avionics Standards Organizations

6.25 The Task Force recommended that States in a position to do so actively participate in the ADS-B related meetings of Eurocae, AEEC and RTCA in order to bring the ASIA/PAC perspectives to the development of avionics standards to facilitate early implementation of air-ground ADS-B capabilities in ASIA/PAC region.

Three city pairs

6.26 In selecting the three city pairs for analysis, the Task Force meeting looked specifically for long haul; international routes where there was a demonstrated interest in implementing ADS-B and where the traffic flows are relatively dense. It was noted that ICAO's Digest of Statistics No. 518 *Traffic by Flight Stage* provides information on capacity, revenue traffic, aircraft operators and types of flight equipment for each station pair. The meeting noted that this

information is now available on-line using ICAO's Integrated Statistical Database (ISDB) and this resource was demonstrated to the meeting. The meeting decided that the key indicator of activity on a route for the purposes of the analyses should be aircraft movement. In considering the data available, the meeting decided to examine Sydney-Singapore, Hong Kong, China-Tokyo, and Singapore-Delhi city pairs.

6.26.1 It was recognised that work needed to continue on the development of plans for selected city pairs to highlight issues for possible implementation in any sub-region. It was considered necessary for a coordinator to gather information such as possible benefits and make proposals for each city pair to use ADS-B to improve capacity as follows:

- City pair 1 (Australia - Singapore): Singapore will act as co-ordinator;
- City Pair 2 (Hong Kong, China - Tokyo): Japan will act as co-ordinator; and
- City Pair 3 (Singapore - Delhi): India will act as co-ordinator.

Priority to ADS-B equipped aircraft

6.27 It was noted that operational priority was considered to be given to ADS-B equipped aircraft in non radar airspace in Australia. This is viewed as a benefit of ADS-B equipage by the airlines. The intent is to increase the efficiency in traffic management by exploiting the use of the improved aircraft position definition from ADS-B surveillance. The controller will be able to provide a more efficient service as a result of the improved surveillance capability. To do this may mean giving priority to ADS-B aircraft to airspace that may have been first used by another non-equipped aircraft. An example of this may give an ADS-B equipped aircraft priority to a particular level as the improved surveillance means more efficient traffic management at air route crossing points further into the flight.

6.28 The meeting noted that the draft conclusion required the ADS-B Task Force to plan at the early stages of deployment of ADS-B to share data. i.e. there is potential to share data in at least the following environments:

- Australia & Indonesia (Christmas Is, Timor area, Bali…)
- Australia & Papua New Guinea
- Australia and Fiji
- Australia and New Zealand
- Indonesia & Singapore
- China & Japan

6.28.1 In view of foregoing, the meeting endorsed the following draft Conclusion formulated by the ADS-B Task Force:

Draft Conclusion 8/17 – Exchange of ADS-B surveillance data with neighbours

That, States be encouraged to share ADS-B surveillance data with neighbouring States and to develop mechanisms to achieve this as ADS-B ground infrastructure requirements are being identified during the design phase.

Problem report database and implementation team

6.29 It was noted that the Task Force had considered necessary to establish a problem reporting database similar to that used successfully by ISPACG. The meeting endorsed the proposal of establishment of a database, which will be initially managed by Australia.

Near-Term definition

6.30 It was agreed that the definition of "Near-Term" of implementation of ADS-B air-ground surveillance service is approximately in the next 5 years. It was recognised that these implementations would have a life of at least 10 to 15 years.

Contact point and national plan for ADS-B air-to-ground surveillance service

6.31 To support development of the regional plan, it was agreed that at subsequent meetings States should provide the following:

- A focal point of contact, and regulator (airframes & ground systems) point of contact;
- A paper or presentation of their ADS-B plans (including associated VHF voice communications); and
- Details of possible timing of implementation of ADS-B ground stations, sites being considered, plans for mandates (if any) etc.

6.32 The meeting noted that there will be a need to initiate action for regional implementations through an amendment to the Doc. 7030 - The Regional Supplementary Procedures (SUPPs). It was suggested that the fast track for a State in the region to submit a proposal for amendment of the SUPPs to process the amendment would be.

6.33 The meeting reviewed the various activities required to be addressed by the Task Force and endorsed the following Draft Decision:

Draft Decision 8/18 – Subject/Tasks List of ADS-B Study and Implementation Task Force

That, the Subject/Tasks List of the ADS-B Study and Implementation Task Force provided in Appendix M be adopted.

6.34 The meeting noted that the ADS-B Working Group meeting will be held at Singapore Aviation Academy from 14 to 15 October 2004. The member from Singapore invited members of this Sub-Group to attend the ADS-B Working Group meeting.

6.35 The meeting agreed that the next Task Force meeting should be preceded by a one or two days Seminar. The ICAO Regional Office was requested to invite all States of the ASIA/PAC region to the ADS-B Seminar and the Third Meeting of the Task Force. The date of the Task Force meeting was tentatively planned for March 2005.

6.36 The meeting noted that the ATM/AIS/SAR /SG/14 meeting also reviewed the report of the ADS-B Task Force. The result of review was highlighted as follows:

6.36.1 Regarding draft Conclusion 2/2 on the exchange of ADS-B surveillance data with neighbours, ATM/AIS/SAR/SG/14 expressed the view that the data integrity issue and the legal issue for the use of data received from other States for application of safety services needs to be adequately studied and addressed.

6.36.2 ATM/AIS/SAR/SG/14 also expressed the view that ADS-B operational procedures should be ready and available before implementation

6.36.3 ATM/AIS/SAR/SG/14 emphasized the need to carry out inter-regional coordination with neighbouring regions.

6.37 Noting above comments from ATM/AIS/SAR/SG, the meeting considered it necessary to encourage States and International Organizations to make arrangement for ATM expert in addition to their CNS experts to participate the activities of the ADS-B Task Force.

ADS-B Demonstration

6.38 A live demonstration on ADS-B was provided to the second ADS-B Task Force meeting by USA. The demonstration showed both regional air taxi ADS-B traffic in Western Alaska, and a large number of UPS Boeing 757/767 1090 ES ADS-B equipped aircraft operating in/out of Louisville, Kentucky.

Universal Access Transceiver

6.39 The U.S. provided an information paper on the Universal Access Transceiver (UAT), which is one of three candidate link technologies being considered to support Automatic Dependent Surveillance Broadcast (ADS-B) along with Mode S and VDL Mode-4. It was informed that UAT was conceptualized in 1994 with the purpose of initiation the development of a new broadband data link from a clean sheet, which would be designed specifically to address the requirements of the ADS-B functionality. The projected benefits envisioned from UAT have made it a serious candidate being considered by the U.S. and the international community. The system is currently being used operationally in Alaska with plans to introduce it into the lower continental U.S. The briefing on "Universal Access Transceiver (UAT)" which was presented to the ICAO Aeronautical Communication Panel in July 2004 was also made available to the meeting. The meeting noted the up-to-date information contained in the paper on UAT for ADS-B, current operational testing and the status of the link decision as well as standardization process.

Agenda Item 7: Aeronautical electromagnetic spectrum utilization:

1) review result of AN-Conf/11 on Agenda Item 5
2) review preparations for WRC-2007

Review result of AN-Conf/11 on Agenda Item 5

7.1 The Secretariat provided details of the outcome of WRC-2003 on all agenda Items of WRC-2003 of interest to aviation. The decisions of the WRC-2003 on all agenda items that addressed or affected aeronautical allocations were wholly or partially favorable to international civil aviation and were in conformity with the ICAO position. Many Administrations and Regional Groupings or Blocks supported important elements of the ICAO position facilitating the introduction of amendments to the Radio Regulations without infringing on the aeronautical use of the electro magnetic spectrum.

7.2 Pivotal in achieving these results was the active participation of aeronautical experts from civil aviation administrations, ICAO and international organizations at the various meetings of the regional telecommunication organizations and at WRC 2003 in accordance with Assembly resolution A-32/13, APANPIRG Conclusions and Action Items of DGCA Conferences.

7.3 The meeting noted the favorable results obtained at the ITU WRC-2003 and identified areas of critical concern to aviation that will be addressed at the WRC-2007. The meeting also recognized the need for ICAO to intensify its activities to secure protection of aeronautical systems from electro-magnetic interference and to develop relevant guidance material, as required (Conference Recommendations 5/1 and 5/2 refer).

7.4 With regard to the organization of spectrum planning mechanisms in ICAO, the meeting agreed that ICAO should conduct a review of the current working arrangements. The meeting further recognized the need for developing a plan for the shared use of frequency bands used for radio navigation aids with global navigation satellite system (GNSS) elements, as well as the long-term ability to provide for required microwave landing system (MLS) assignments.

7.5 The meeting noted that there are significant issues that have implications for aviation resulting from WRC-2003 such as:

a) the use of the 14 GHz band for non-safety of life broadband satellite communication for aircraft passengers internet applications, HF interference mitigation techniques, protection of DME with the implementation of L5 GNSS, protection of radars with the evolution of L2 GNSS, protection of radars in the 2.9-3.1 GHz and 5 GHz bands, and spectrum allocations for GBAS/GRAS and VDL Mode-4; and

b) co-primary allocations in the 9 GHz aeronautical radar band, spectrum requirements for wideband aeronautical telemetry, use of the 5 GHz aviation band for air-ground voice communication and runway incursion systems, and modernization of civil aviation telecommunication systems through current satellite allocations.

Amendment to Article 5 of the ITU Radio Regulations

7.6 The meeting also noted the changes agreed at WRC-2003 to Article 5 of the Radio Regulations relating to radio services. The meeting noted the new footnotes against the frequency bands allocated to ARNS and RNSS.

Review preparations for WRC-2007

7.7 The agenda of WRC-2007 of interest to aviation community was presented to the meeting. The draft ICAO position on WRC-2007 agenda items was also noted by the meeting. The meeting further noted the course of action for development and finalization of ICAO position for WRC-2007 as follows:

a) August 2004 Aeronautical Communications Panel (ACP) Working Group F completes draft ICAO position for WRC-07;

b) Fourth quarter 2004: ANC reviews the draft ICAO position. Draft ICAO position will be sent to States and international organizations for comments;

c) First quarter 2005: ANC undertakes final review of the draft ICAO position in the light of the comments received and transmits it to Council for review and approval;

d) Second quarter 2005: Council reviews and approves ICAO position for transmittal to States;

e) During 2004 - 2006 ICAO and States participate in the preparatory activities for WRC-07 in the ITU and the regional telecommunication organizations;

f) First quarter 2007 ACP Working Group F develops proposals to update the ICAO position, as required, considering the progress of the preparatory activities in ITU-R and regional telecommunication organizations;

g) Second quarter 2007 ANC reviews the proposed updates; and

h) Second quarter 2007 Council reviews and approves the updates for transmittal to States. The ICAO position will be submitted to the WRC-07 as an information paper.

Action taken by APANPIRG and DGCA Conference for preparation of WRC- 2007

7.8 The meeting noted that States were urged to assign high priority to the aeronautical spectrum management activities. Conclusion 14/24 formulated by the Fourteenth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/14) held in Bangkok from 4 to 8 August 2003 has identified actions to be taken by States for preparation for WRC-2007.

7.9 The Air Navigation Commission, while reviewing the report of APANPIRG/14, noted the Conclusion and requested the Secretary General to continue encouraging States to participate at various levels, in different fora to provide support for the ICAO position for WRC-2007 so as to protect aeronautical frequency spectrum.

7.10 It was noted that a State Letter was issued urging States to designate a focal point or a contact person responsible for preparation for WRC-2007 in accordance with Conclusion 14/24 of APANPIRG/14 and Action Item 40/5 of the DGCA Conference and notify the ASIA/PAC Regional Office detail of designated focal point or contact person in each Administration responsible for

preparation for WRC 2007. In response, some States have already designated focal points and had provided contact addresses to the Regional Office. All the details have been posted in the ICAO website to facilitate coordination. The meeting agreed that States that have not nominated contact persons to do so as soon as possible and notify the Regional Office.

Regional Preparatory Meetings

7.11 It was reorganized that the two Regional Preparatory Meetings conducted for WRC-2003 at the ASIA/PAC Regional Office in conjunction with the Working Group F Meetings of the ACP were found to be very helpful and productive. It is, therefore, expected that the First Preparatory Meeting for WRC-2007 will be held in Bangkok in conjunction with ACP Working Group F Meeting during February 2005. It was noted furlther that the second APT Regional Preparatory Group Meeting for WRC-2007 is expected to be held during early 2005.

Preparation for WRC- 2007 by Australia and USA

7.12 The meeting noted the main highlights of the preparatory works underway in Australia for WRC-2007. It was stated that there are significant issues that have implications for aviation in the Agenda for WRC-07 including co-primary allocations in the 9000 MHz aeronautical radar band, spectrum requirements for wideband aeronautical telemetry and telecommand, air-ground voice communication and runway incursion systems, and modernisation of civil aviation telecommunication systems through current satellite allocations. It is important that careful consideration should be given to protect aeronautical services at WRC-2007.

7.13 The United States also reviewed WRC-2007 agenda of interest and fully supported ICAO's initiative and urged participation by States aviation representatives at various regional forums to support the ICAO position.

7.14 IATA emphasized that active participation by States representatives at national level and regional level preparatory activities well before WRC-2007 is very crucial. It was further stated that satisfactory result of WRC-2003 was achieved due to conducted efforts by all concerned.

Agenda Item 8: Review of the implementation of WAFS:

1) implementation of ISCS and SADIS
2) transition to GRIB and BUFR coded WAFS products

Implementation of ISCS and SADIS

8.1 Under this agenda item the meeting reviewed 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).

8.2 The list of authorized users of current SADIS and ISCS in the ASIA/PAC Region is provided in FASID Table MET 7. It was recalled that this table was included in the FASID for information purposes and maintained up-to-date by the Secretariat. FASID Table MET 7 was reviewed and the Secretariat took note of the necessary updates.

Follow-up of the SADISOPSG/9 meeting

8.3 The meeting reviewed the executive summary of the ninth meeting of SADISOPSG, held at the ICAO Western and Central African (WACAF) Regional Office, Dakar, 1 to 4 June 2004. SADISOPSG/9 meeting discussed important developments of the system, and formulated two draft conclusions for consideration by the PIRGs concerned.

8.4 SADISOPSG reviewed the status of the SADIS Internet-based FTP service. It was recalled in this regard, that the FTP service was introduced as a **back-up** to the SADIS broadcast and that, until now, the back-up service has been provided free-of-charge to the authorized SADIS users. The SADISOPSG was of the opinion that the components of the SADIS FTP service should be included in the SADIS inventory, with the understanding that the users of the FTP service would continue to be considered SADIS users and would have to contribute to the mandatory cost recovery. The meeting noted that the SADIS Provider State would not recover any of the initial capital costs associated with establishing the FTP service; only the costs associated with providing an on-going operational service were proposed for inclusion in the SADIS inventory, as of 1 July 2005. With the proposed change, the management of the SADIS FTP service would become part of the tasks of the SADISOPSG, and the SADIS users would be in a position to influence the development of the SADIS FTP service.

8.5 In view of the above, and in order to formalize the role of the SADIS Internet-based FTP service, the meeting formulated the following draft conclusion for consideration by APANPIRG/15 meeting:

Draft Conclusion 8/19 - SADIS Internet-based FTP Service

That, in parallel with the satellite broadcast, the SADIS Provider State be invited, as of 1 July 2005, to make WAFS forecasts and OPMET data available, as a primary component of the SADIS service, in accordance with the *SADIS User Guide,* through the Internet-based FTP service.

Note 1.— The development and management of this service will be overseen by the SADISOPSG and its work programme will be amended accordingly.

Note 2.— The SADIS Cost Recovery Administrative Group (SCRAG) will be informed of the planned date of implementation.

8.6 The meeting noted the reservation expressed by the delegate from New Caledonia regarding the draft conclusion above.

8.7 The meeting reviewed the SADIS Strategic Assessment Tables prepared by the SADIS Provider State with entries regarding the current and projected data volumes during the years 2005-2008. Noting that 9-hour TAFs from a number of ASIA/PAC States will soon be included in the ROBEX scheme for regular exchange and thus will be relayed to London for uplink, the projected data volumes were slightly revised. The meeting agreed on the revised tables and formulated the following draft conclusion:

Draft Conclusion 8/20 - 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.

SADIS developments

8.8 The meeting noted the information regarding important recent developments of the SADIS and WAFS provided by the delegate from the UK, as described below.

Migration to SADIS 2G

8.9 The SADIS Provider State was nearing the completion of the trial of the prototype SADIS 2G system. This system involved a new type of data modulation and utilized internet protocol (IP) end-to-end. The system was engineered to make use of "off-the-shelf hardware", as opposed to the proprietary nature of the current first-generation (1G) system hardware. The difference in modulation schemes employed by the first and second generation broadcasts would require all SADIS users to purchase a new receiver that is compatible with the 2G broadcast.

8.10 SADISOPSG agreed that the dual operations of the SADIS 1G and SADIS 2G services should begin on 1 September 2004 and that the SADIS 1G should be terminated on 31 December 2008. This would allow a long enough transition period (i.e. more than four years) for all SADIS user States whilst it would minimize the additional costs related to the operation of a dual broadcast.

8.11 Further information was provided on the migration plan from 1G to 2G system. Notification on the implementation of 2G will be provided to all SADIS users via a SADIS administrative message and a posting on the SADIS web site. In addition, all SADIS user States will be informed of the implementation of the 2G service via an ICAO State letter. It was proposed that from the date when 2G service is declared operational, there should be no additional users of the 1G service and prospective new users should be asked to procure hardware that is compatible with the 2G service. The meeting felt that SADIS user States in the ASIA/PAC Region should be encouraged to start planning for the transition from SADIS 1G to 2G and formulated the following draft conclusion:

Draft Conclusion 8/21 - State's migration plans for the transition from 1G to 2G SADIS service

That, the SADIS user States in the ASIA/PAC Region be encouraged to commence planning for transition from SADIS 1G to 2G to ensure that it can be achieved well within the agreed time scale, i.e. before the termination of the 1G service on 31 December 2008.

8.12 The meeting was informed that currently three suppliers of 2G hardware have been identified and contact details for these companies were provided. The SADIS provider was of the opinion that additional manufacturers of the hardware could be easily found within the VSAT

marketplace but three suppliers were sufficient at the outset of this project. Users simply need to approach one or a number of these vendors to obtain competitive quotations with a view to procuring all of the necessary hardware. It was emphasized that the 2G hardware will be significantly cheaper than 1G.

8.13 It was emphasized that the migration from 1G to 2G SADIS in the ASIA/PAC States will be a very important undertaking in the WAFS implementation. It was necessary to monitor the migration process in the States in order to ensure that by the target date of 31 December 2008 all SADIS users obtain 2G systems. It was agreed that this task should be assigned to the WAFS Implementation Task Force and its work programme was amended as shown in the Decision in para.8.9.1 of this report.

Migration to GRIB and BUFR-coded WAFS forecasts

8.14 The meeting was informed of recent developments related to the migration to GRIB and BUFR-coded WAFS forecasts. It was recalled that the forthcoming cessation by the WAFCs of the T.4 products on 1 July 2005 will require all users to upgrade their visualization software so that they can utilize the GRIB and BUFR coded WAFS products.

8.15 The meeting noted in particular that:

- The two WAFCs were planning to start disseminating BUFR coded SWM data towards the end of 2004. The SWM BUFR bulletins would be distributed via SADIS on Port 1 PVC3. Users were advised that an update to BUFR visualization software will be required to utilize the data in these bulletins;

- The two WAFCs intended to implement the requirement for inclusion of vertical height information and crossing jets in WAFS SIGWX forecasts arising from Amendment 73 to ICAO Annex 3 in November 2004. The change would be included on the WAFS T.4 SIGWX charts (SWH and SWM), and in the BUFR coded SIGWX bulletin for jetstreams. Users were advised that an update to BUFR visualization software would be required to utilize the additional data in these bulletins.

Implementation of the ISCS

8.16 A transition to the TCP/IP successor ISCS network was being undertaken by the ISCS Provider State. On-site upgrade of the VSAT receivers and the network interface for supporting TCP/IP was conducted by MCI, the contractor of the new ISCS system, starting December 2003. The software required for the user system to receive the TCP/IP broadcast was made available to ISCS user States and the TCP/IP broadcast commenced in February 2004. The delegate from the US advised the meeting that the ISCS transition was nearing completion but the switch to TCP/IP only broadcast had not yet been accomplished since there had been a consistent loss of approximately 15% of the data transmitted over the IP protocol. The meeting was assured that the ISCS Provider will take all necessary action to resolve the residual problems with the TCP/IP broadcast. The ISCS Provider State has extended the dual broadcast of X.25 and TCP/IP protocols until 31 July 2004 and further extension was likely until the data loss issue has been fully resolved. The ISCS Provider State will notify ISCS users and ICAO at least two weeks prior to the cessation of the X.25 broadcast.

8.17 The meeting noted the latest information provided by the ISCS Provider State regarding the current status of the ISCS transition and expressed concern due to the fact that for a number of States in the ASIA/PAC Region the status was indicated as unknown. The meeting was further informed by the Secretariat that only 7 ISCS user States in the region responded to the query on the TCP/IP transition, which demonstrated the difficulties faced by the ISCS Provider State and the Secretariat to monitor the status of ISCS implementation. This was particularly difficult for the Pacific

States, for which the information available indicated serious problems with operating the previous generation ISCS with the STAR4 workstations.

8.18 The experts from Australia, New Zealand and Japan provided feedback on their experience with the ISCS transition from X.25 to TCP/IP. These States experienced some difficulties due to the specific set-up for receiving the ISCS transmission which did not involve the standard receiving equipment provided by the US. It was suggested that future changes to the system and the data broadcast should employ a more flexible design strategy to cater for a range of user set-ups and that all ISCS user States should be given complete technical information on such changes well in advance. The member from the US agreed with the recommendations regarding the need for provision by the ISCS Provider State of detailed technical information well in advance of planned changes in the ISCS service.

8.19 In view of the above discussion, the meeting recommended that a better mechanism for monitoring the ISCS implementation in the ASIA/PAC Region should be utilised. It was recalled in this regard that the still outstanding APANPIRG Conclusion 9/18, called for the conduct of a survey of the operational efficacy of the ISCS/2, and the ISCS Provider State had been invited by ICAO to review and consider this proposal. It was also recalled that the US supported this proposal, however in view of the planned changes of the ISCS service, it was proposed to postpone the implementation until the new generation ISCS became operational. Since this has been already achieved, the meeting proposed that regular annual surveys of the operational efficacy of the ISCS/2 should be conducted in a similar manner with those for the SADIS service. To facilitate the annual surveys and the coordination of ISCS operational matters, the meeting supported a proposal for each ISCS user State to nominate an operational personnel to act as an ISCS focal point. The member from the ISCS Provider State fully agreed with these proposals and the meeting formulated the following draft conclusion:

Draft Conclusion 8/22 - Annual Surveys of the Operational Efficacy of the ISCS/2 and Nomination of ISCS Focal Points

That,

a) the ISCS Provider State in coordination with ICAO Secretariat be invited to conduct annual surveys of the operational efficacy of the ISCS/2 in the ASIA/PAC Region starting 2004-2005 and report the results to the CNS/MET Sub-group meetings; and

b) ICAO invite the ISCS user States in the ASIA/PAC Region to nominate operational personnel to act as an ISCS focal point to facilitate coordination of ISCS related matters.

Notes:

(1) It is proposed that the format of the annual survey questionnaire and summary report will be similar to those for SADIS operational efficacy in order to allow inter comparison.

(2) The ICAO Regional Office will assist in circulating the survey questionnaire to the ISCS user States with copy to ISCS focal points and in collecting the responses to be analyzed by the ISCS Provider State.

Review of the WAFSOPSG/1 report

8.20 The meeting reviewed the executive summary of WAFSOPSG/1 held in November 2003 at ICAO Office, Lima, Peru. WAFSOPSG members from ASIA/PAC Region, Australia and China, presented at this meeting papers pertained to SIGWX lead time, icing forecasts for ETOPS operations, technical issues with BUFR migration, and more efficient operational WAFS.

Amendment to the Basic ANP and FASID

8.21 It was recalled that one of the tasks of the WAFSOPSG was to ensure the currency of WAFS-related procedures in the air navigation plans (BANP and FASID). Therefore the WAFSOPSG/1 meeting developed a draft proposal for amendment of the BANP and FASID procedures in order to harmonize these procedures between the ICAO regions since they were de facto global. The meeting was informed that this amendment proposal was already discussed at the CNS/MET SG/7 meeting and that only few editorial changes have been made after the WAFSOPSG/1 meeting.

Items related to GRIB and BUFR migration

8.22 The meeting noted the important outcome from the WAFSOPSG/1 meeting related to the GRIB and BUFR migration and, in particular:

- A suggestion for the continual provision of WAFS products in the T4 chart form through the Internet-based back-up services beyond Amendment 73 to Annex 3 was not supported;

- APANPIRG/14 Conclusion 14/31, which called for the WAFSOPSG to consider the requirement for automatic production of SIGWX charts for the standard ICAO chart areas from BUFR coded WAFS products to be included into the set of minimum requirements to be achieved by the WAFS workstation manufacturers was not supported. The reason was that the provision requiring the availability of WAFS forecasts for fixed areas of coverage would have to be addressed to Contracting States and it would not be possible to place specific requirements for the WAFS workstation manufacturers in Annex 3;

- Guidelines related to the depiction of meteorological and other features on WAFS forecast charts derived from the BUFR and GRIB data should be completed by the WAFC Provider States as a matter of urgency;

- Guidance for the elimination of “edge effects” by BUFR visualization software was formulated;

- A list of software vendors who meet the high-level criteria concerning the depiction of meteorological and other features on WAFS forecast charts derived from the BUFR and GRIB data should be developed by the WAFC Provider States, and should be placed on the WAFSOPSG website upon completion;

Other items:

- There is no need to introduce a new forecast in the T4 chart form with the area of coverage "L" to cover polar routes in view of the availability of global WAFS forecast in the GRIB and BUFR code forms;

- In response to APANPIRG/14 Conclusion 14/34, adequate notification procedures for significant changes to the WAFS operation will be developed by the WAFC Provider States;

- IATA reiterated no operational requirement for WAFS SWM forecasts;

- The depiction of SIGWX in the WAFS forecasts should be harmonized with every effort to minimize differences between the products issued by the two WAFCs;

- The feasibility and advisability of extending the lead time for issuance of SIGWX forecasts to 16 hours will be studied by the WAFC Provider States;

Issues in the migration to GRIB and BUFR

Regional preparedness

8.23 It was recalled that, based on the results of the ASIA/PAC GRIB/BUFR regional survey in 2003, 83% of ASIA/PAC States/Territories had yet to acquire the capability to operationally convert BUFR coded WAFS products into SIGWX charts and 69% of States/Territories had yet to acquire the capability to operationally convert GRIB coded WAFS products into Wind/Temp charts. In view of these results, APANPIRG/14 Conclusion 14/30 urged ASIA/PAC States to start the necessary preparations for the migration to the operational use of GRIB and BUFR coded WAFS products as a matter of urgency, if they had not already done so. Furthermore, States having difficulties in the migration to the operational use of GRIB and BUFR coded WAFS products were encouraged to urgently approach WMO for assistance under the WMO Voluntary Cooperation Programme (VCP). Notwithstanding a recent finding that many of the BUFR visualisation software packages continue to exhibit various non-compliant issues (see para. 8.26 below), most of the participants at the meeting indicated that their States/Territories will be ready for the operational use of GRIB and BUFR WAFS products by 1 July 2005, the scheduled date for the removal of T4 facsimile products from the satellite broadcast.

8.24 It was realized by the meeting that only 11½ months were left prior to the final migration to GRIB and BUFR coded WAFS products on 1 July 2005. Therefore, it was imperative for the States to *complete*, as a matter of urgency, the necessary preparations regarding the acquisition of appropriate equipment, workstations, software and training for the migration to the operational use of GRIB and BUFR coded WAFS products. The observer from WMO advised the meeting that, in view of the very short time left to the migration to the GRIB/BUFR coded WAFS products, any request for Voluntary Cooperation Programme (VCP) assistance should be submitted to WMO as soon as possible. The processing of such requests by WMO would be significantly facilitated if the States concerned could contact potential donors and subsequently inform WMO. The observer from WMO cautioned the group about the expected outcome; in view of the short time left before 1 July 2005, it would be unlikely that sufficient funds could be made available unless the WMO Permanent Representatives of the States concerned gave high priority to this issue and took appropriate action within WMO.

Current status of the visualization software

8.25 The meeting considered as one of the most important operational implications of the migration to BUFR-coded SIGWX forecasts the apparent need for the meteorological offices concerned to perform manual quality control and adjustments (e.g. to remove residual obscuration/overlapping of features) of SIGWX charts generated from BUFR. The extent of the manual operations required would likely depend on the functionalities of the specific visualization software package used (e.g. availability of automatic de-cluttering or auto-placement function).

8.26 In this connection, the delegate from the UK provided the results of the latest assessment of the SADIS visualization software packages conducted by the SADIS Provider State during February to March 2004. This assessment was based on the revised guidelines on the depiction of SIGWX features on WAFS forecast charts derived from BUFR developed by the WAFC Provider States and provided to software manufacturers in January 2004. The results (also available on the SADIS website http://www.metoffice.com/sadis/software/index.html), showed that only two of the evaluated BUFR visualization software packages were currently able to produce Annex 3 compliant WAFS SIGWX charts. The rest of the software packages continued to exhibit various non-compliant issues, some of which having flight safety implications, e.g. tropical cyclone symbol missing/obscured.

8.27 The meeting considered the situation described above as a serious obstacle for the successful completion of the migration to GRIB and BUFR coded WAFS products by the target date of 1 July 2005. The meeting noted that this issue had recently been discussed in SADISOPSG/9 and the SADISOPSG had formulated a conclusion (Conclusion 9/18) to invite the WAFSOPSG to consider the continuation of the issuance of WAFS SIGWX forecasts in a chart form, for a limited period of time with minimum cost implications, beyond 1 July 2005, to ensure that most WAFS users be prepared to receive BUFR-coded SIGWX forecasts. While an extension for a limited period of time would allow more time for States to complete the necessary preparations for the migration, the meeting was also aware that the 1 July 2005 was already an extension from the original date of 25 November 2004 on which Amendment 73 to Annex 3 would become applicable. Furthermore, concerns were raised that such extension might be misinterpreted by States to imply that further extensions might be possible and this could have a negative impact on States' preparation for the migration. Nevertheless, after considering the pros and cons, the meeting agreed to support the SADISOPSG Conclusion 9/18 and formulated the following draft conclusion:

Draft Conclusion 8/23 - Limited extension of the availability of WAFS forecasts in chart form beyond 1 July 2005

That, the WAFSOPSG be invited to consider, as a matter of urgency, the continuation of the issuance of WAFS SIGWX forecasts in a chart form, for a limited period of time after 1 July 2005 to ensure that the WAFS users be prepared to operationally use BUFR-coded WAFS products in SIGWX chart production.

Training

8.28 The delegates from the UK and US informed the meeting that as a follow-up of APANPIRG Conclusion 14/32 the SADIS and ISCS Provider States had kindly agreed to provide a conjoint training in the operational use of GRIB and BUFR coded WAFS products for both SADIS and ISCS user States in the ASIA/PAC Region tentatively schedule for January 2005. The meeting recalled that, in organizing the first training in the operational use of GRIB and BUFR coded WAFS products for the Asia and Pacific Regions in 2002, the SADIS Provider State provided financial assistance for a number of participants. The meeting was informed that the SADIS and ISCS Provider States were considering to provide similar assistance under the WMO VCP to facilitate participation

in the conjoint training which would be the last one of this kind for the regions prior to the final migration to GRIB and BUFR coded WAFS products. Both WAFCs stressed that in order for the training to be successful, States should send personnel directly involved in the operational production of WAFS forecast charts to the training.

8.29 In view of the above discussions, it was considered important that both SADIS and ISCS user States in the ASIA/PAC Region should be made aware of the evaluation results of the visualization software packages and make full use of the conjoint training on the operational use of GRIB and BUFR coded WAFS products. The meeting formulated the following draft conclusion regarding the actions that ASIA/PAC States have to take, as a matter of urgency, for the migration to the operational use of GRIB and BUFR coded WAFS products:

Draft Conclusion 8/24 – States' Actions for the Migration to the Operational Use of GRIB and BUFR Coded WAFS Products

That,

(a) States in the ASIA/PAC Region be urged to complete, as a matter of urgency, the necessary preparations for the migration to the operational use of GRIB and BUFR coded WAFS products, if they have not already done so, prior to target date for final migration to GRIB and BUFR-coded WAFS products, 1 July 2005;

Note: States having difficulties in the migration to the operational use of GRIB and BUFR coded WAFS products be reminded to urgently approach WMO for assistance under the WMO Voluntary Cooperation Programme (VCP). In order to expedite WMO consideration of VCP requests, States are encouraged to contact potential donors and subsequently inform WMO.

(b) be urged to review the GRIB and BUFR visualization software evaluation results available on the WAFSOPSG and SADIS websites and ensure that software packages capable of producing WAFS forecast charts fully compliant with Annex 3 are acquired;

(c) arrange for appropriate personnel to attend the training on the operational production of WAFS charts from GRIB and BUFR coded WAFS products provided conjointly for the SADIS and ISCS user States to be held in the ASIA/PAC Region in January 2005.

Automatic depiction of SIGWX forecast in chart form from BUFR-coded WAFS products

8.30 The meeting noted that WAFSOPSG/1 meeting did not support the APANPIRG Conclusion 14/31. The meeting recalled in this regard that the gist of APANPIRG Conclusion 14/31 was the automatic depiction of SIGWX forecast in chart form from BUFR-coded WAFS products for *at least* the standard ICAO areas which States would continue to be responsible to provide as part of flight documentation. This is to eliminate the need of human intervention (e.g. to perform manual de-cluttering of overlapped SIGWX features) in the generation of WAFS SIGWX charts compliant with Annex 3 requirements. Such human intervention was considered to be a step backward in providing efficient service as a number of States had automated the process of generating flight documentation from the existing T4 facsimile charts received from the WAFCs. The delegate from the UK advised the meeting that, subject to endorsement by the SADISOPSG, liaison with the BUFR visualisation

software manufacturers on the automatic depiction requirement and further evaluation of the software packages by the SADIS Provider State could be pursued as a matter of priority.

8.31 The meeting expressed strong support to the requirement for automatic generation of SIGWX charts from BUFR-coded WAFS products without the need for manual quality control and adjustments. It was stressed that the manual quality control, if needed in the future, would have serious operational and cost implications for the States' aeronautical meteorological services. In this connection, the meeting formulated the following draft conclusion:

Draft Conclusion 8/25 - Automatic Depiction of SIGWX Forecast In Chart Form from BUFR-coded WAFS Products

That, the WAFSOPSG and SADISOPSG be invited to consider, as a matter of urgency, the requirement for eliminating the need for human intervention with regard to the depiction of SIGWX forecast in chart form from BUFR-coded WAFS products.

Note: The SADIS Provider State should liaise with the WAFS workstation manufacturers with a view to carrying out a further evaluation of their software against this new requirement.

ASIA/PAC WAFS Implementation Plan

8.32 The WAFC Provider States provided to the meeting a number of updates to the ASIA/PAC WAFS Implementation Plan and Procedures maintained by the WAFS Implementation Task Force (WAFS/I TF) regarding contact details of the WAFCs, and the anticipated dates for the conjoint GRIB/BUFR training and the satellite distribution of SWM in BUFR format. The meeting reviewed the updates and formulated the following draft conclusion:

Draft Conclusion 8/26 - ASIA/PAC WAFS Implementation Plan and WAFS Implementation Task Force

That,

(a) the ASIA/PAC WAFS Implementation Plan and Procedures be amended as shown in Appendix O to the report to reflect the changes in the plans and schedules of the two WAFCs in the migration to GRIB and BUFR;

(b) the work programme of the WAFS Implementation Task Force be amended as given in Appendix P to this report

Other issues related to WAFS

8.33 The delegate from China provided feedback on a more efficient operational WAFS. The feedback touched upon the issues of frequent VSAT equipment upgrades, software updating methods, the use of PC as WAFS workstation, flexibility in design of the communications interface between the VSAT equipment and WAFS workstation, availability of BUFR encoding and decoding software, and GRIB/BUFR training. The delegates from the UK and US provided responses to the feedback indicating that the issues had either been addressed or taken into consideration by the WAFC Provider States in the implementation and further development of the SADIS and ISCS.

8.34 The expert from India provided information on the launch of a new satellite broadcast service for the dissemination of meteorological data and products with the potential for dissemination OPMET information including WAFS products. The system has been used domestically and there

were plans to extend the service to the neighbouring States, which were mostly least developed countries. While the meeting noted that the service could be a low-cost alternative for domestic and international users to receive meteorological data and products, the attention of the meeting was drawn to the "Guidelines for authorized access to the world area forecast system (WAFS) satellite broadcast" and the "Guidelines for access to aeronautical meteorological information" promulgated by ICAO. In particular, the telecommunication facilities for the international exchange of OPMET information (including the WAFS upper wind, humidity and temperature and significant weather forecasts and alphanumeric messages) should be the aeronautical fixed service (AFS), in accordance with Annex 3 and the regional air navigation plans.

8.35 The meeting was informed by the delegate from the US on the current availability of WAFS charts on the web site of the National Weather Service and that the US would continue to provide this information in some standard graphical format in the future. The delegate from UK added that the UK was giving serious consideration to the provision of the standard area SIGWX charts on the SADIS Internet-based FTP server, which was also available to ISCS authorised users, in some standard graphical format, e.g. "gif" or "png". The meeting was advised by the Secretariat that the use of Internet for provision of aeronautical information was still under study by an ICAO body and that the services described above should be considered as services outside the ICAO WAFS framework.

Agenda Item 9: Exchange of OPMET Information:

1) review of the report of OPMET/M TF/2 meeting
2) review of the regional guidance documents on OPMET

9.1 Under this agenda item the meeting addressed issues related to the exchange of OPMET information in the ASIA/PAC Region and to the interregional OPMET exchange.

Second meeting of the OPMET Management Task Force (OPMET/M TF/2)

9.2 The meeting recalled that the OPMET Exchange Task Force (OPMET/E TF) was established by Decision 13/28 of APANPIRG. The Seventh Meeting of the CNS/MET Sub-group, July 2003, reviewed the terms of reference and work programme of the OPMET Exchange Task Force and recognized that the OPMET exchange and the ROBEX scheme needed continuous management, therefore, the meeting proposed to assign some additional tasks to the group and to rename it to ASIA/PAC OPMET Management Task Force (OPMET/M TF).

9.3 The Second Meeting of the ASIA/PAC OPMET Management Task Force (OPMET/M TF/2) was held in Bangkok, Thailand from 10 to 13 February 2004.The meeting was attended by 15 experts from seven ASIA/PAC States, one expert from the Sultanate of Oman, representing the ICAO MID Region, and one expert from IATA.

9.4 The meeting reviewed the current status of the regional and inter-regional OPMET exchange. Results of OPMET data monitoring exercises conducted by Bangkok RODB and IATA were studied in order to identify OPMET data shortfalls. Improvements of the exchange have been also identified due to introduction of new OPMET bulletins by the States. The meeting reviewed the operations and content of the Regional OPMET Data Banks (RODB).

9.5 OPMET/M TF/2 meeting reviewed the draft new version of ROBEX Handbook (12th edition) and the ICD for OPMET DB access procedures. Both documents were updated as necessary and recommended for publication by ICAO.

9.6 The meeting considered the new requirements for the exchanges under the ROBEX scheme. It was agreed that the available 9 and 12-hour TAF from the ASIA/PAC States should be included in the exchange. The meeting stressed on the need to improve the exchange of AIREP, SIGMET and advisories and formulated corresponding action items. The meeting also considered the development of the OPMET management procedures, in particular, development of procedures for monitoring of the OPMET information, OPMET bulletins update procedure, procedures for SIGMET tests, and OPMET data banks quality control procedures.

9.7 OPMET/M TF/2 meeting updated the list of action items and assigned specific the main tasks to small project teams, namely, an AIREP Team and a SIGMET Team.

9.8 The meeting reviewed the updated TORs, work programme and composition of the OPMET/M Task Force and noted, in particular that Indonesia and Hong Kong, China expressed the wish to become members of the group. The meeting agreed on the proposals made by the OPMET/M TF/2 meeting and formulated the following draft decision:

Draft Decision 8/27 – Terms of reference and work programme of OPMET/M TF

That, the terms of reference, work programme and composition of the OPMET management Task Force be amended as shown in Appendix Q to the Report.

New edition of ROBEX Handbook and the ASIA/PAC ICD for access to the OPMET Data Banks

9.9 The meeting recalled that the ROBEX Handbook was the main guidance material providing detailed procedures for OPMET exchange in the ASIA/PAC and MID ICAO regions under the ROBEX scheme. The Handbook defined the responsibilities and procedures to be followed by the ROBEX centres, as well as the content and format of the ROBEX bulletins.

9.10 ROBEX Handbook was prepared and kept up-to-date by the ICAO Office, Bangkok in coordination with ICAO Office, Cairo. The current edition of the Handbook was the 11th edition published in August 1998. Since then a number of changes in the regional and inter-regional OPMET exchanges had taken place and the Handbook needed to be updated accordingly.

9.11 In preparing the new edition of the ROBEX Handbook, it had been fully revised and updated. OPMET/M TF/2 meeting reviewed the draft and provided comments for its finalization. The final draft of the 12th edition of ROBEX Handbook, 2004, is provided in Appendix R to this report.

9.12 The meeting noted the main changes introduced with the new 12th edition of the ROBEX Handbook as briefly outlined below:

- All OPMET data types were included in the ROBEX scheme;
- METAR and TAF tables were updated in consultation with the States;
- New tables were developed for FC TAF, SIGMET and VA and TC advisories;
- The structure of the scheme was amended; the new structure is presented in a diagram in the 12th edition;
- Responsibilities of the ROBEX centres, RODBs and IROGs have been updated;
- Obsolete material has been removed;
- New chapters have been introduced on the management of the ROBEX scheme and the OPMET exchange.

9.13 The meeting reviewed also the new edition of the ASIA/PAC ICD for access to the OPMET Data Banks. This document was also fully revised and restructured in accordance with the changes in the ROBEX Handbook. It was planned to develop a new part of the ICD, an ASIA/PAC OPMET data catalogue containing all available ASIA/PAC OPMET information.

9.14 In reviewing the draft ROBEX Handbook and ICD, the meeting provided some updates to the tables, which were noted. The meeting formulated the following draft conclusion:

Draft Conclusion 8/28 – 12th edition of the ROBEX Handbook and 3rd edition of the ASIA/PAC ICD

That, ICAO publish the new 12th edition of the ROBEX Handbook and the new 3rd edition of the ASIA/PAC Interface Control Document for Access to the Regional OPMET Data Banks (RODB), as shown in Appendix R and Appendix S to the report, in accordance with the established procedures.

Note: It is recommended that both documents be made available on the ICAO web site.

Issues related to the format of the METAR and TAF bulletins

9.15 The meeting noted with concern the findings of OPMET/M TF/2 that serious discrepancies in the format of METAR and TAF messages and bulletins existed in the region. This was illustrated by a number of examples provided by RODB Singapore to the OPMET/M TF/2 meeting. The meeting felt it necessary to urge the States to implement fully the ICAO and WMO provisions related to the format of the OPMET messages and bulletins and formulated the following draft conclusion:

Draft Conclusion 8/29 – Fostering the standardization of OPMET bulletins in the ASIA/PAC Region

That, the States in the ASIA/PAC Region be urged to fully implement the provisions related to the format of the METAR, SPECI and TAF messages and bulletins specified in the Annex 3 and in WMO Manual on Codes (WMO No. 306).

Note: OPMET/M TF will provide the States concerned with specific information regarding the observed discrepancies from the standard formats.

Issues related to AIREP exchange

9.16 The meeting noted the concern expressed by the OPMET/M TF/2 meeting regarding the lack of up-to-date information on the status of AIREP exchange in the Region. It was felt that a survey on AIREP exchange with the ASIA/PAC and MID States would be necessary in order to collect information on the availability and the usage of the AIREP bulletins, and to verify the adequacy of the ROBEX procedures on the AIREP exchange. OPMET/M TF was aware that the exchange of air-reports was a complex issue, therefore, a small sub-group, named AIREP Team was established to carry out the survey.

9.17 The AIREP Team developed a draft survey document, shown in Appendix T to the report, for circulation to all States in the ASIA/PAC and MID Regions. The States will be requested to provide updated information on the procedures utilized by the ATS units and MWOs, and by the ROBEX centres involved in collection and dissemination of AIREP messages/bulletins. It was proposed that the survey would encompass a 10-day sampling period during which all ROBEX centres will be requested to file all AIREP bulletins received and transmitted and to forward this information to the AIREP team for processing.

9.18 In order to assist in preparing the survey, RODB Brisbane and Singapore carried out preliminary tests on the availability of AIREP bulletins in their respective databases. The findings of this preliminary survey were as follows:

- Only a few ROBEX centres participate in the regular AIREP exchange with Singapore and Brisbane;
- The abbreviation “ARP” and “ARS”, which should be used in the beginning of each individual AIREP to identify AIREP and AIREP SPECIAL respectively, are not used by most of the issuing centres;
- The Annex 3 requirement for converting the position information to latitude/longitude value is not followed by a number of centres.

9.20 The meeting noted that currently WMO abbreviated heading for the AIREP message did not make any distinction between routine and special air-reports; the data type designator UA was used for both. However, the requirements for distribution of the routine (AIREP) and special air-reports (SPECIAL AIREP) reports were different. Taking into account that this matter should be addressed to WMO, the meeting formulated the following draft conclusion:

Draft Conclusion 8/30 - New data type designators for bulletins containing special air-reports

That, in order to facilitate the exchange of the special air-reports, WMO be invited to designate a new data type designators (T_1T_2) for the WMO abbreviated headings of the bulletins containing special air-reports and, in particular, for special air-reports for volcanic ash.

9.21 The meeting noted the information provided by the delegate from New Zealand regarding problems in the handling the MET block of the ADS messages (ADS MET) due to the absence of a published standard for their dissemination. In view of this, the form of the ADS MET messages transmitted to New Zealand MetService was the AIREP code. MetService forward meteorological information from the ADS and manual aircraft reports in the same routine hourly bulletins to the WAFCs via the WMO GTS. For assimilation into NWP models the ADS derived reports cannot be distinguished from manual AIREPs. This distinction is important as the manual AIREPs can have quite different error characteristics to the ADS derived reports. The delegate from New Zealand was of the view that to realize the full benefits of the ADS derived reports, and considering the increasing volume of the reports, there appears to be a need to distinguish them, and any compiled bulletins, from the conventional manual AIREPs with the inclusion of independent header information, report protocols and QA procedures. Such development required the technical guidance of the WAFCs and WMO. The issues related to the MET block of the ADS messages are further highlighted under agenda item 13.

Results of monitoring exercises by the RODBs

9.22 The meeting noted the results of two monitoring exercises conducted by RODB Singapore. In the first one the availability of “long” TAF and METAR bulletins was monitored. The results for the one-week monitoring showed availability of 92% and 93% of the full complement according to the reporting schedule in the ROBEX Handbook. The second trial was aimed at estimating the amount of requests to the RODB Singapore and to highlight the most frequent sources of such requests. Both exercises were appreciated by the meeting as very useful for the development of standard monitoring procedure, which was one of the tasks of the OPMET/M TF.

9.23 The RODB Bangkok presented to the meeting the newly developed software, which was developed especially for the purposes of OPMET monitoring as requested by the OPMET/M TF. The new software allows for fully automatic monitoring of all OPMET data types and provides user interface for creating different reports on availability by bulletin or station for an arbitrary period of time. Sample results of monitoring results produced by the software were presented. The meeting considered the development of the software product for automatic OPMET monitoring as a major contribution to the task of improving the OPMET availability and regularity from the ASIA/PAC Region.

Proposal for new TAF with extended period of validity

9.24 The delegate from IATA presented to the meeting new user requirements regarding the validity of the terminal aerodrome forecasts (TAF). With the current increased operational flight times, i.e. 18 hours or even more (e.g. SIN-JFK), the requirements for TAF validity period has changed. TAFs used for flight planning should cover the ETA +/-1hr of the operation, not only for the destination, but also for all alternate airports. For the very long haul operations 18-hour or 24-hour TAF were not sufficient for the flight planning phase. Some operators have indeed indicated a requirement for 30-hour TAFs. It was also stated by IATA that for flight planning purposes only, 18-hour, 24-hour or 30-hour TAFs were necessary as long as the lead-time for TAF issuance was not longer than one hour and an update procedure is established. These TAFs should be issued every 6 hours. If this was the case, it was stated that there would be no operational need for a 9-hour TAF.

9.25 The meeting considered these new user's requirements and expressed concern that this was a very significant change to the current provisions of Annex 3. As regards the eventual discontinuation of the "short" TAFs, the meeting felt that since in ASIA/PAC Region these TAFs were not yet required by the regional ANP, and just considered for inclusion in the ROBEX scheme, this group was not the appropriate body to consider the proposal by IATA.

9.26 Regarding the extension of the validity of the "long" TAF, the group was of the view that this issue should be given due consideration since it was invoked by the introduction of new very long haul operations operations, which were currently between Asia and the U.S. The group discussed in this regard some aspects of the extended TAFs. Concerns were expressed regarding the desired and achievable accuracy of the 30-hour forecast in comparison with the current 18 and 24-hour forecasts. The group expressed a general support to the need for studying the feasibility of changing the period of validity of the long TAFs and was aware that this was "global" rather than a regional issue. The group agreed in this regard, on the following Draft Conclusion:

Draft conclusion 8/31 - Feasibility of extending the validity of TAF to 30 hours

That, ICAO be invited to study in coordination with WMO the feasibility of the introduction of a new TAF with a period of validity of 30 hours in view of the emerging new requirements for very long haul flights.

9.27 The delegates from the U.S. and Singapore expressed their interest in conducting trials in the issuance of 30-hour TAF required by IATA. It was agreed that such trials would be evaluated on the basis of bi-lateral agreement between the two States in consultation with IATA regarding the operational requirements. The group was of the view that these trials would provide a very good basis for assessment of all issues related to the future introduction of longer range TAF as a result of the emerging user's requirements and expressed its appreciation to Singapore and the U.S. for their agreement in evaluating the feasibility of carrying out this new task.

Migration to BUFR-coded aeronautical meteorological messages (METAR/SPECI and TAF)

9.29 The meeting was informed that the Fourteenth World Meteorological Organization (WMO) Congress held in Geneva, Switzerland, from 5 to 23 May 2003 endorsed a plan for migration from the traditional alphanumeric codes (TACs) to the so-called table-driven code formats (TDCFs), i.e. BUFR and CREX code forms. The migration plan would allow the use of table-driven codes in parallel with alphanumeric codes as of the year 2007, and would require the exclusive use of table-driven codes around the year 2015.

9.30 It was recalled that, in accordance with *Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization* (Doc 7475), WMO was the organization responsible for the aeronautical meteorological codes. Since WMO had firm plans to migrate from all alphanumeric codes to the table-driven codes, with regard to aeronautical meteorological codes, there was no other option than to undertake the migration towards table-driven codes.

9.31 This was the first time that the attention of the CNS/MET SG was drawn to this issue in view of the need for an orderly migration to the TDCFs, which would require development of a detailed regional implementation plan involving MET and CNS experts. It is expected that the transition to the TDCFs for aeronautical meteorological messages would be a major undertaking and potentially expensive. Therefore, the PIRGs were urged to initiate work on this important issue as soon as possible.

9.32 The meeting was provided with a brief overview of the TDCFs and their benefits. It was clarified that only BUFR code should be considered for the aeronautical meteorological messages. It was noted that a number of meteorological related messages do not appear to be included in the transition programme. These include SIGMET, AIRMET, GAMET, Volcanic Ash Advisories and Tropical Cyclone Advisories.

9.33 The communication problems related to the transition to TDCFs were briefly outlined. WMO Transition plan was based on the World Weather Watch (WWW) in which it was assumed that products were disseminated over the Global Telecommunications System (GTS), the WMO global network. In the aviation domain this data was promulgated via the AFS. With the introduction of AMHS it would be expected that this traffic, currently, promulgated on AFTN, would be transferred to the AMHS, as AFTN cannot support binary data. It should be noted that according to the implementation plan most ASIA/PAC States would be ready for bit oriented data exchange for the identified transition period. However, in order to handle BUFR-coded OPMET data detailed information should be provided regarding the message headers, the detailed format of the messages and bulletins, etc. In addition to ATN and ATN-compatible networks, which would be able to carry the new message formats, some alternative ways were mentioned on which further study was necessary. These include: the use of the satellite distribution systems, SADIS and ISCS, which currently promulgate binary data and are part of the AFS; the use of the Internet; this subject is being discussed by the Aviation Use of the Public Internet Study Group (AUPISG); other possible solutions based on TCP/IP networks.

9.34 It was recalled that changes to aeronautical meteorological codes in the past, e.g., the major change of METAR/SPECI and TAF code in 1993, and the modification to these codes in 1996, created a lot of stress on national and international level. These were expensive undertakings requiring hardware and software changes, training of MET, COM, ATS and airline personnel, regional and inter-regional coordination etc. It was stressed that the transition to BUFR-coded aeronautical meteorological messages is a change of a larger scale than the previous changes. Therefore, the regional planning and implementation groups were requested to address the migration to the TDCFs as a matter of urgency despite the fact that the final target date was more than 10 years from now.

9.35 The meeting was informed that the SADIS provider State was in a very initial phase of evaluating the migration to TDCFs, however it was clear that it would be a challenging task and that significant cost implications were likely. This State was conducting additional studies and business cases to assess these implications and reevaluating the potential benefits of the said migration.

9.36 The meeting agreed that the task to address the migration to TDCFs should be assigned to the existing ATN Transition Task Force, which reports directly to APANPIRG, and to the OPMET Management Task Force, which reports to CNS/MET SG. Both groups should review the matter based on their specific expertise and coordinate a draft migration plan. In order to foster the coordination between the groups, it was envisaged that one of the next regular annual meetings of the ATN Transition TF and the OPMET/M TF should be held conjointly.

9.37 In view of the above discussion, the meeting formulated the following Draft Decision:

Draft Decision 8/32 – Planning for migration to BUFR-coded aeronautical meteorological messages

That,

a) the ATN Transition Task Force and the OPMET Management Task Force be tasked to address the issues related to the transition to BUFR-coded aeronautical meteorological messages by conduct studies, as necessary;

b) the two Task Forces develop in coordination a regional plan for migration to BUFR-coded aeronautical meteorological information.

Note: A conjoint meeting of the two Task Forces would be desirable to address the issues after completing studies in their respective areas.

Agenda Item 10: Review of the implementation of ICAO Warning Systems:

1) International Airways Volcano Watch (IAVW)
2) tropical cyclone watch

Progress in the implementation of the IAVW in the ASIA/PAC Region

10.1 The two main events related to the implementation of IAVW in the ASIA/PAC Region during the period after CNS/MET SG/7 meeting were the ASIA/PAC SIP on volcanic ash SIGMET and the first meeting of the IAVW Operations Group (IAVWOPSG/1).

Review of the outcome from the first meeting of IAVWOPSG

10.2 The meeting reviewed the executive summary of the first meeting of the IAVWOPSG/1 meeting, which was held in the ICAO Regional Office, Bangkok from 15 to 19 March 2004. It was recalled that the terms of reference of IAVWOPSG included *inter alia* that the group should ensure the currency of the IAVW-related procedures in the regional ANPs (BANP and FASID). Therefore, the PIRGs were expected to review the outcome of the IAVWOPSG meetings and identify any follow-up actions necessary at regional level. Similarly, issues related to IAVW planning raised by the PIRGs should be referred to the IAVWOPSG for consideration.

10.3 The meeting reviewed the IAVWOPSG/1 conclusions and decisions, which require follow-up action by the ICAO regions. In regard to Conclusion 1/1, Amendment to IAVW-related regional procedures in the Basic ANP and FASID, draft amendment proposals was developed by the Secretariat as shown in Appendix U (for the BANP) and Appendix V (for the FASID) to the report. It was noted that the amendment proposal needed some additional editorial processing before circulating to States, e.g., to rearrange the information for the ACCs, to which the VAACs were to send volcanic ash advisories. This information was necessary for the new format of FASID Table MET 3B, agreed by IAWOPSG/1.

10.4 The meeting noted IAVWOPSG Conclusion 1/13 regarding the development of a new table (FASID Table MET 3C) listing the State volcano observatories from which information was required by the ACCs, MWOs and VAACs. This conclusion was in response to the new provision in Amendment 73 to Annex 3 regarding the State volcano observatories. In order to assist the PIRGs, IAVWOPSG developed a set of principles, which would allow an equitable evaluation of State volcano observatories.

10.5 The meeting agreed that a survey with the ASIA/PAC States with active volcanoes should be conducted in order to designate the volcano observatories for inclusion in the new FASID Table MET 3C, following the principles developed by IAVWOPSG. The following Draft Conclusion was formulated:

Draft Conclusion 8/33 — Designation of State volcano observatories

That, ICAO Regional Office,

a) carry out a survey with the ASIA/PAC States, that maintain volcano observatories monitoring active volcanoes, in order to designate selected volcano observatories for inclusion in the ASIA/PAC Basic ANP and FASID (Doc 9673), following the principles formulated by the IAVWOPSG; and

b) Introduce a new FASID Table MET 3C listing the designated State volcano observatories required to provide direct notification of volcanic activity to ACCs, MWOs and VAACs.

10.6 The meeting noted IAVWOPSG Decision 1/15 regarding the upgrade of the status of the volcanic ash advisory to a "warning", which was considered not feasible in view of the far-reaching and legal implications that would emerge from such a change. Thus, the volcanic ash SIGMET issued by the MWOs should continue be regarded as the primary warning product for volcanic ash.

10.7 The meeting noted the serious concerns expressed by the members from the SADIS and ISCS provider States regarding the feasibility of implementing IAVWOPSG Conclusion 1/17, which called for uplinking of ASHTAM and NOTAM for volcanic ash on the ISCS and SADIS broadcasts. The task was considered very difficult and would require a lot of coordination with the AIS services providers. It was expected that the necessary changes to the SADIS Gateway in order to handle ASHTAM and NOTAM would have cost implications. The group was further informed that the IAVWOPSG had invited SADISOPSG to coordinate this task and that the Secretariat would develop the corresponding proposal for amendment of Annex 15, for consideration by IAVWOPSG/2 meeting.

Volcanic ash advisories and SIGMET issues

ASIA/PAC MET SIP on volcanic ash SIGMET

10.8 The meeting was informed of the ASIA/PAC MET Special Implementation Project (SIP) on volcanic ash SIGMET carried out by ICAO in 2003. The main objectives of the SIP were:

- to provide assistance to States' meteorological authorities in eliminating the deficiencies related to the provision of volcanic ash SIGMET;
- to assist in improving the coordination between the ATS units (ACC or FIC) and their associated meteorological watch offices (MWO), and the volcanological agencies, in order to ensure immediate response to the volcanic ash events in the States concerned;
- to assist in improving the coordination between the MWOs and the respective responsible Volcanic Ash Advisory Centres (VAAC).

10.9 The SIP was conducted through visits to five States in the ASIA/PAC Region with a large number of active volcanoes: Japan, the Philippines, the Russian Federation (visit coordinated with ICAO Office, Paris), Indonesia and Papua New Guinea. SIGMET-related procedures were presented during one-day seminars carried out in all States visited with representatives from MET, ATS and volcanological agencies.

10.10 The outcome of the SIP was in the form of five State mission reports containing a number of recommended and agreed actions in the MET, ATS and AIS fields. These are described in brief in Appendix W to this agenda item.

10.11 The meeting was briefed on the main findings, the feedback received from States and the proposed action for eliminating deficiencies related to the implementation of the IAVW formulated in the reports sent to the States visited. It was expected that the SIP would have very positive results in terms of improved availability of SIGMET for volcanic ash from the most active volcanic areas in the Region. The meeting expressed appreciation to ICAO for the successful completion of this important task.

Developments in VAAC Darwin

10.12 The meeting noted information on the continued effort by Australia to aid the development and dissemination of SIGMETs for volcanic ash in the region. Australia was considering a number of strategies, including, but not limited to, visits to MWOs and ACCs, the preparation of 'draft SIGMETs' by the Darwin VAAC for the MWOs in its area of responsibility, and regional test exercises. It was recognized that action along these lines should be done collaboratively in the region

and suggested that the Asia/Pacific VA/TC Implementation Task Force should coordinate these and similar actions.

Developments in VAAC Tokyo

10.13 The delegate from Japan informed the group that until November 2003, Tokyo VAAC had issued VA advisories only when a volcanic plume raised over 5,000m (17,000ft) above sea level, taking account that international flights normally use higher levels. The low-level VA advisories had been issued for the domestic flights only. To comply with the Annex 3 provisions, Tokyo VAAC removed the height threshold for VA advisories issued for the international exchange in November 2003 and has since been issuing VA advisories regardless of the height of the volcanic ash plume for all the volcanic eruptions within its area of responsibility. It was noted in this regard, that the forecast accuracy for the winds in low altitudes was lower because of the effect of topography, etc. Therefore, it was expected that the forecast of the location of volcanic ash clouds in the lower altitudes would be subject to larger errors.

10.14 Tokyo VAAC has been using the meso-scale Model (MSM) of JMA with 10 km horizontal resolution for forecasting volcanic ash dispersion since November 2003, which resulted in an improvement of both the spatial and temporal resolution of the forecasts for the area around Japan. The meeting was informed also of a CD-ROM entitled “Study report of Volcanic Ash Clouds on detection using meteorological satellite imagery”, which was produced by Tokyo VAAC and scheduled to be published and distributed to the VAACs and MWOs concerned later this year. Tokyo VAAC opened also a web site in English in December 2003 and it was planned that the VA advisories will be available on this site starting March 2005. (URL: http://www.jma.go.jp/JMA_HP/jma/jma-eng/jma-center/vaac/index.html)

Development of test procedures for VA and TC SIGMET

10.15 The meeting recalled Recommendation 1/12, Implementation of SIGMET requirements, formulated by the MET Divisional Meeting (2002) and, in particular, sub-item c) of this recommendation, calling for the relevant planning and implementation regional groups to conduct periodic tests of the issuance and reception of SIGMET messages for volcanic ash. The Rapporteur of the VA/TC Implementation TF presented in this regard draft procedures for conducting regional tests on the issuance and dissemination of VA and TC advisories and SIGMETs.

10.16 The meeting was aware that the MWOs, listed in FASID Table MET 3A under the area of responsibility of the TCACs, and in FASID Table MET 3B under the area of the responsibility of VAACs, should be prepared to issue SIGMET for TC and VA respectively, when necessary. However, due to the very rare occurrence of these phenomena, many MWOs were issuing such SIGMETs extremely rarely. The meeting recognized that, in order to maintain the IAVW and TC watch systems ready-for-action, regular exercises involving the advisory centres and the MWOs under their areas of responsibility should be performed.

10.17 The meeting reviewed the draft procedures for VA and TC SIGMET tests in the ASIA/PAC Region presented by the VA/TC Implementation Task Force, as shown in Appendix X to the report to this agenda item. Similar procedures for the EUR Region have been studied by the Task Force in preparing the ASIA/PAC procedures. The main purpose of the tests was to check the adequacy of the telecommunication procedures and the awareness of the participating MWOs regarding the requirements for the issuance and dissemination of VA and TC SIGMET.

10.18 The proposal for the SIGMET tests was fully supported by the meeting. Some members shared their experience with similar exercises that proved to be very informative in identifying deficiencies. It was felt that these procedures should be further developed in order to address concerns regarding possible disruptions of the normal SIGMET dissemination during the

tests. It was agreed that the procedures would be finalized by the VA/TC Implementation Task Force very soon to allow for the first test to be conducted by the end of 2004 or latest in early 2005.

10.19 The meeting stressed that in order for the tests to be successful it was extremely important that all TCAC and VAAC Provider States and all MWOs concerned in the ASIA/PAC Region should contribute actively to their implementation. Therefore, the meeting formulated the following Draft Conclusion:

Draft Conclusion 8/34 – Implementation of SIGMET tests in the ASIA/PAC Region

That, ICAO Regional office invite all TCAC and VAAC Provider States in the ASIA/PAC Region, and all ASIA/PAC States with MWOs responsible for issuance of SIGMET for volcanic ash and/or tropical cyclones, to take active part in the regular SIGMET tests to be carried out according to the agreed procedures.

Note: ICAO Regional Office will coordinate the tests and notify the participating States about their schedule and procedures.

Tropical cyclone advisories and SIGMET issues

Implementation of Tropical cyclone advisory centres (TCAC)

10.20 The meeting noted that TCACs Darwin, Nadi and Tokyo had implemented the correct ICAO format for TC advisories since the beginning of 2003 and TCACs Honolulu and Miami reported full compliance with Annex 3 since May 2003. The only TCAC in the ASIA/PAC Region that had not implemented the Annex 3 format for the TC advisories by the time of CNS/MET SG/7 meeting was TCAC New Delhi. Therefore, APANPIRG Conclusion 14/41 called for implementation, as a matter of urgency, of the requirements for issuance of TC advisories by TCAC New Delhi. Consequently, the non-implementation of TCAC New Delhi was included in the APANPIRG List of Air Navigation Deficiencies with urgent priority.

10.21 As a follow-up of the above conclusion an action plan was set up by India and the start of issuance of TC advisory by TCAC New Delhi had been scheduled for the beginning of 2004. The centre did start preparing TC advisories as scheduled, however, in the beginning they were not disseminated correctly, thus not received by users. After further consultation, TCAC New Delhi updated the AFTN addresses to which TC advisories were sent and the communication problem was solved.

10.22 Though some issues related to the correct format of the TC advisories by TCAC New Delhi still existed, the meeting considered that the main issue regarding the availability of advisory information was resolved and agreed to advise APANPIRG that the MET deficiency related to TCAC New Delhi, should be considered eliminated and removed from the List of Air Navigation Deficiencies. It should be noted with appreciation that the rapid elimination of this particular deficiency was possible due to the full support by the relevant Indian authorities.

Coordination with WMO on tropical cyclone issues

10.23 The meeting noted the information provided by the Secretariat on the on-going coordination with the WMO on the issues related to the implementation of TC advisories and SIGMETs. ICAO had recently attended as observer the 31st Session of the WMO/ESCAP Panel on Tropical Cyclones, where issues related to the implementation of the tropical cyclone watch in the Bay of Bengal and the Arabian Sea were coordinated with the Panel States.

Outstanding implementation issues

10.24 The meeting noted that while a significant improvement has been achieved in the implementation of the TC advisories by the TCACs, the issuance of SIGMETs for tropical cyclones by the MWOs, was still a serious implementation issue. This issue was addressed by means of a survey with the ASIA/PAC States on the use of the TC advisories in the issuance of TC SIGMET carried out by the VA/TC Implementation Task Force. The meeting reviewed the results of this survey, as presented in the Appendix Y to the report.

10.25 Based on the survey results obtained, the following points were highlighted by the meeting:

a) Many States use, as the source of information for the issuance of SIGMET for tropical cyclones, information other than TC advisories, issued by the TCACs; these other information sources were either States' own model data and forecasts, or warnings issued by the Joint Typhoon Warning Center (JTWC) of the U.S. It was identified that this situation may lead to inconsistency between TC advisories and TC SIGMETs;

b) Although JTWC was not an ICAO TCAC, many States depended on the warnings from this centre. Warnings of JTWC contain not only the parameters included in TC advisories, but also additional information such as wind gusts, radius of storm winds and remarks on actual and prognostic reasoning, which was considered useful by some States;

c) Some States expressed the need of more frequent update cycle for of TC advisories, e.g., every 3 hours, and of including a 6-hour forecast of the TC centre in the advisory; and

d) There were still some States indicating that they did not receive TC advisories. They use alternative information such as warnings in other format.

10.26 The meeting agreed that the results of the study revealed important weaknesses in the implementation of the TC watch for aviation in the region and noted the concerns expressed by different members on the availability and quality of the TC advisories by the designated TCACs in the ASIA/PAC Region. Some States were of the opinion that their own forecasting methods and experience would provide better basis for SIGMET and that all information available should be used in preparing the TC SIGMET. Some felt that the status of the TC advisory should be upgraded to a warning in order to ensure consistent information for tropical cyclone affecting more than one FIR. The meeting was informed by the Secretariat in this regard, that similar proposal for upgrading the volcanic ash advisories to the warning status was rejected by the IAVWOPSG due to a number of operational and regulatory implications. Changing the status of the advisories and SIGMETs for tropical cyclones was not considered feasible for the time being for the same reasons.

10.27 The meeting was advised by the Secretariat that Annex 3 stated clearly that the TC SIGMETs should be based on the advisories issued by the TCACs, designated in the regional ANP and that did not prevent the meteorological offices of using other sources of information available. The ICAO system of TC advisory centres was established in close cooperation with the WMO and the TCACs were selected amongst the WMO Regional Specialized Meteorological Centres (RSMC) for tropical cyclones. In view of this, it was felt necessary to improve the products of the established ICAO system of TCACs and MWOs, by means of better coordination between the centres and offices. The meeting formulated the following Draft Conclusion in this regard:

Draft Conclusion 8/35 - Improvement of issuance of SIGMET for tropical cyclones

That, State be urged

a) in preparing SIGMET for tropical cyclone to pay due attention to the TC advisories issued by the responsible TCACs ; and

b) to provide feedback on the availability and the quality of the TC advisories provided by the responsible TCACs in order to assist in eliminating any deficiencies.

Survey of the correctness of the format of the TC advisories

10.28 The meeting was informed by IATA of the study carried out to identify any discrepancies in the format of the TC advisories issued by TCACs. The study involved all TCACs with the exception of TCAC New Delhi. The results presented indicated that, in general, the format of the advisories has reached a very satisfactory level with some minor inconsistencies, which were pointed out for each individual TCAC. The meeting found the results of this study very helpful in eliminating any residual problems with the TC advisories format and appreciated the work done by IATA.

10.29 The delegate from IATA also presented a proposal for amendment of the TC advisory format, as shown in Appendix Z to the report. The meeting felt that this proposal needed thorough review and that since this was not a regional but “global” issue, the proposal should be addressed to ICAO for further study by an appropriate body. It was recalled in this regard that APANPIRG/14 had already addressed the need for further development of the provisions related to the TC advisories and SIGMETs (Conclusion 14/42 refers) and that as a follow-up of this conclusion a corresponding task has been set up in the Technical Work Programme of ICAO in the air navigation field. Therefore, it was agreed the proposal by IATA will be forwarded to ICAO Secretariat for review.

10.30 The member from Japan presented to the meeting recent developments in the TCAC Tokyo. The meeting noted some improvements achieved, in particular, the improvement of the cyclone tracks forecast, and changing the format of TCA messages in regard to the format of TC name in accordance with Annex 3. TCAC Tokyo was studying the operational procedure for inclusion of 18 hour forecast in the advisory, for which the content of current TC advisory is “NIL”. However, it was not possible to produce this forecast at present.

Agenda Item 11: Quality assurance in the MET field

11.1 Under this agenda item the meeting was provided with an update on the status of preparation of the ASIA/PAC seminar on Quality Management Systems for the aeronautical meteorological services (QMS seminar). It was recalled that the organization of a QMS seminar was a follow-up of APANPIRG Conclusion 13/32 and that WMO was invited to arrange, in coordination with ICAO, the said training seminar.

11.2 The meeting noted the work on drafting the programme of the QMS seminar carried out by Hong Kong, China, Australia and New Zealand in coordination with WMO and ICAO. The seminar was initially scheduled earlier for October 2004. However, the latest information received after the Session of WMO Executive Council was that a decision was taken to postpone all WMO training activities in the field of aeronautical meteorology, not funded under the WMO regular budget, until 2005. Therefore the QMS seminar had to be postponed for the second half of 2005, subject to further confirmation by WMO.

11.3 Notwithstanding the above postponement, the meeting expressed appreciation of the work done so far and expressed hope that the QMS seminar would be given highest priority by the WMO after the training activities are renewed in 2005. The expert from WMO confirmed that it was also the position of WMO that this seminar was of highest importance.

11.4 The meeting noted the information provided by the Secretariat that the Aviation Meteorological Office (AMO) of Korea Meteorological Administration, Republic of Korea, obtained ISO 9001:2000 certification for the implementation of a quality management system on the provision of the aviation meteorological services in October 2003.

Agenda Item 12: MET support for operations at aerodromes and terminal areas

Windshear and Turbulence Detection

12.1 The delegate from Hong Kong, China presented to the meeting recent developments in the windshear and turbulence developments at the Hong Kong International Airport.

Enhancement of the Anemometer-based system for windshear detection

12.2 In May 2004, a new anemometer-based automatic windshear detection and alerting algorithm, known as the Anemometer-based Windshear Alerting Rules – Enhanced (AWARE), was put into operational use, replacing LLWAS. In addition to the six airport anemometers, the new algorithm makes use of wind data from three weather buoys and an anemometer on an island within the airport approach and departure corridors to compute the magnitude of low-level windshear for issuing automatic alerts.

12.3 Performance of AWARE was evaluated through playback of past windshear cases and after tuning, AWARE proved to have superior performance over LLWAS. For instance, in a windshear episode which occurred in the afternoon of 14 January 2004, AWARE successfully captured the shear associated with convergence between the westerly sea breeze and background easterlies and generated headwind gain alerts of 15 knots for the western approach corridor of the northern runway. The shear computed by AWARE also agreed well with aircraft reports.

12.4 In view of the demonstrated better performance of AWARE, it has been integrated into HKO's operational automatic windshear alerting system to replace LLWAS in May 2004. Work is being undertaken to evaluate the benefits of the two additional weather buoys deployed in early 2004 with a view to incorporating them into AWARE.

Latest development in the use of a Doppler LIDAR system

12.5 The meeting was informed that the Hong Kong Observatory (HKO) operated a suite of weather sensors for windshear and turbulence detection at the Hong Kong International Airport (HKIA). These weather sensors include a terminal Doppler weather radar (TDWR), a network of 20+ anemometers and three wind profilers. This system has been enhanced by the installation of a pulsed Doppler LIDAR at HKIA for detection of windshear and turbulence detection in clear-air conditions. Since its installation, the LIDAR has captured many interesting windshear events in clear air and facilitated the monitoring of windshear by the forecasters. These include sea-breezes, gust front ahead of thunderstorms as well as complex wind flow behind hilly terrain.

12.6 The LIDAR has proved useful in supplementing the TDWR in windshear detection for a much wider range of weather conditions. In addition, LIDAR data collected in a turbulence episode during the passage of Typhoon Imbudo on 24 July 2003 suggested the possible application of LIDAR in low level turbulence detection.

Area of Responsibility of MWOs provided by the United States

12.7 The meeting was informed that the current MWO responsibility for the Oakland FIR was shared by three Meteorological Watch Offices (MWOs) provided by the United States:

- The Aviation Weather Center (KKCI) provides the meteorological watch and SIGMETs for the portion of the Oakland Oceanic FIR north of 30 north latitude, and the portion east of 140 west longitude which is between the equator and south of 30 north latitude;
- The MWO at the Weather Forecast Office (WFO) Honolulu (PHFO) is responsible for the Oakland Oceanic FIR north of the equator and south of 30 north latitude from 140 west to 160 east longitude; and

– The MWO at WFO Guam (PGUM) has responsibility for the Oakland Oceanic FIR west of 160 east longitude and north of the equator.

12.8 A decision has been made by the U.S. to realign responsibilities for the provision of aviation services in the Pacific. Beginning in late September 2004, WFO Guam will no longer have MWO responsibilities. The responsibility for the meteorological watch and provision of SIGMETs for the portion of the Oakland FIR currently provided by WFO Guam will move to MWO provided by the WFO in Honolulu.

12.9 Information regarding the changes above will be provided in due course to the ICAO Secretariat in order to amend the ASIA/PAC FASID Table 1B accordingly.

Provision of VOLMET service by the United States

12.10 The meeting was informed by the delegate from the U.S. of the VOLMET broadcasts provided by the U.S. on High Frequency (HF) voice and the intention to continue such broadcast in the foreseeable future. Currently, Islip Flight Service makes automated VOLMET broadcasts from antennas at Barnegat, New Jersey for the Atlantic and Caribbean. Honolulu Flight Service makes manual broadcasts for the Pacific and Gulf of Alaska.

12.11 The meeting was further informed on the ongoing work under the concept of 'HF regression' to reduce dependence on high frequency voice. VOLMET equipment was considered costly to maintain and might be unsupportable in the long term. VOLMET was an obvious target to reduce costs in the communications navigation surveillance/air traffic management infrastructure. However, even the large carriers and business jets were using VOLMET as a backup when other systems failed or were unavailable in certain areas. For smaller operators, VOLMET was often the only means of obtaining these safety critical updates. Therefore, the meeting was advised that the U.S. planned to continue the provision of the HF VOLMET Service in the future.

Augmentation of Meteorological Telecommunication Services at Indian Airports

12.12 The delegate from India informed the meeting that the Indian Meteorological department has recently replaced its earlier Automatic Messages Switching Systems (AMSS) at four Indian International airports namely New Delhi, Mumbai, Chennai and Kolkata with latest state-of-the-art AMSSs. These four AMSSs have additional features which were not available earlier. Amongst the new features, the meeting noted:

– OPMET Data Bank with remote automatic query from any AFTN centre;
– Reception of Meteorological data through AFTN as well as Global Telecommunication System (GTS) in WMO format;
– Automatic conversion of message format from GTS to AFTN and vice versa.
– Reception of SADIS data;
– GRIB and BUFR decoders for generating prognostic wind/temp charts, and SIGWX charts etc;
– Flightman workstation for briefing the pilots;
– Automatic generation of flight folders in electronic form for each flight at predefined schedule;
– Automatic dissemination of Meteorological data/flight folders to different users like airline offices through e-mail , Fax or FTP;
– Support for Current Weather Display Systems for ATC officers at all the required locations in ATC; etc.

Agenda Item 13: CNS/ATM systems implementation:
1) CNS
2) MET

Key Priorities

13.1 The meeting undertook a review of the list of Key Priorities for the CNS/ATM implementation updated and approved by APANPIRG/14. No additions to the list were proposed. It was emphasized that the efforts should be made on implementation. This was strongly supported by IATA. Experts of the Sub-group were encouraged to consider planning implementation of key priorities within the established target date. The updated list is at Appendix Z to the report on Agenda Item 13.

CNS/ATM Implementation Planning Matrix

13.2 The meeting reviewed and updated the CNS/ATM Implementation Planning Matrix. The Matrix contains the implementation status of CNS elements such as ATN, AIDC, CPDLC, GNSS and ADS. The Matrix was expected to be reviewed by APANPIRG and its Sub-Groups on a regular basis to assess progress of implementation. The updated Matrix is provided in Appendix A1 to the report on Agenda Item 13.

MET component of CNS/ATM

13.3 The chairman of METATM Task Force of the CNS/MET SG presented to the meeting the task force activities since the CNS/MET SG/7 meeting in July 2003.

13.4 As a follow-up of APANPIRG Conclusion 13/30**,** Regional survey on the current status and future plans of States to process the MET component of ADS reports, the TF has conducted the regional survey and the preliminary results of the survey were reported to the meeting, as follows.

13.5 The survey revealed:

- Seven (of 13) States indicated ADS was being used (2 on trial/test basis);
- One State currently has arrangements in place for MWO to receive, quality control and forward the MET block to WAFCs with a further three planning to have arrangements in place in the future;
- Successful trials of MET block extraction have been conducted in two other States.

13.6 A number of States indicated that ADS was not likely to be adopted in the near term due to adequate surveillance radar coverage. In this connection, the meeting recalled that this issue has been addressed by APANPIRG/14 (Conclusion 14/44) and forwarded to the METLINKSG for further study.

13.7 The only State currently utilizing the MET block of ADS operationally has noted a number of concerns regarding the quality control of the data and deficiencies in the AIREP code for distributing the data.

13.8 Several members of the group expressed concerns of the lack of operational procedures regarding the processing and use of the MET block of the ADS. Some members of the group felt that the issues related to ADS should be addressed and guidance should be provided to ensure that the MET block of ADS messages, which was not of practical use currently, would become viable MET information in the future.

13.9 In discussing this issue, the group noted that the current Annex 3 provisions were that automated routine air-reports (i.e. ADS reports) were required only at the WAFCs, and beyond the WAFCs these reports should be considered as basic MET data and therefore, by definition, a prerogative of WMO. Regarding issues of the quality of ADS reports, the meeting was informed that they were already being addressed by the WAFSOPSG.

Fostering of exchanges between MET and ATM

13.20 The Chairman of MET/ATM TF informed the meeting that as a follow-up of APANPIRG Conclusion 14/45 the TF had been involved in the organization of a MET/ATM coordination seminar and WMO has been approached regarding the availability of funds. The date and venue of the seminar have not yet been specified, however, the TF was developing a tentative programme for the seminar.

Promoting Communication Between the MET and ATM communities

13.21 Material was being prepared identifying areas of Annex 3 (Amendment 73), which dealt specifically with arrangements between meteorological authorities and air traffic services authorities. The TF expected this material to be very useful as a reference to MET and ATS Authorities and to facilitate discussion between MET and ATM communities and the development of new MET products in support of ATM. It would also provide input for the inclusion of ATM requirements in the CNS/ATM plan.

Future work of the TF

13.22 The meeting noted the TF plans to:

- further assist with the inclusion of ATM requirements for MET information in the CNS/ATM plan as a task of the CNS/MET SG;
- develop a range of sample products for MET information required in support of ATM for discussion between relevant MET and ATM authorities; and
- assist with the planning of a MET/ATM coordination seminar in ASIA/PAC Region.

Survey on pilot's requirements on uplinking of meteorological information

13.23 The expert from Hong Kong, China presented information on studies and trials on CNS/ATM systems. In respect to meteorological information uplink, Hong Kong, China conducted a survey in early 2004 to solicit views from pilots regarding their requirements of uplinking weather products. The meeting considered the results of the survey very interesting, therefore, they were reproduced as Appendix A2 to the report.

13.24 Based on the results of the survey above, Hong Kong Observatory developed a plan on the meteorological information uplink, taking into account several factors, such as: availability of products, product update frequency, presentation format of products, encoding of meteorological products and data link applications.

Agenda Item 14: Review of deficiencies in the CNS and MET fields
1) review report of DRTF/2 meeting
2) review and update the List of Deficiencies in CNS and MET fields

1) Deficiency Review Task Force

14.1 The Chairman of the Deficiency Review Task Force (DRTF) presented outcome of the process of the Task Force. The DTRF was established by APANPIRG/13 with the following Terms of Reference.

a) Review the current practices relating to the identification, assessment and reporting of air navigation deficiencies in the Asia/Pacific Region based on the Uniform Methodology;

b) Based on a) above, develop specific procedures related to various steps in dealing with deficiencies, such as: identification, collection and validation of information, safety assessment and prioritization, development of action plans, reporting and monitoring of the corrective actions; and

c) Based on the results from b) above, develop concise guidelines to be used by all concerned involved in the resolution of the air navigation deficiencies.

14.2 The DRTF met in July 2003 and again in May 2004. After the first meeting the task force presented the first draft of the 'Asia/Pacific Supplement to the Uniform Methodology for the Identification, Assessment and Reporting of Air Navigation Deficiencies' to APANPIRG/14. APANPIRG/14 requesting that the draft be circulated to States in the Asia/Pacific region for comments. APANPIRG/14 decided also that the DRTF should conduct a second meeting in order to finalize the regional procedures regarding the identification, assessment and reporting of air navigation deficiencies and to develop further guidelines to be included in the Asia/Pacific Supplement to the Uniform Methodology, taking into account comments received from States and Organizations concerned. The DRTF/2 meeting prepared the final draft of the Supplement that included a detailed flow-chart of the whole process of dealing with the air navigation deficiencies from their identification to the final elimination and removal from the APANPIRG List of Deficiencies. The Task Force has formulated a conclusion for APAIRG that the supplement be adopted. The TF also thought it would be useful for APANPIRG to have comments of its sub groups before it considered the draft conclusion.

14.3 The Task Force Chairman highlight the definition of a deficiency as a non compliance with an approved regional air navigation plan or non compliance with a standard or recommended practice that results in an impact of safety, regularity or efficiency of international civil aviation. Referring to the flow chart he illustrated the classification process as 'U' for items requiring urgent attention due to have a direct impact on safety, 'A' top priority items necessary for air navigation safety and 'B' immediate requirements necessary for air navigation regularity and efficiency. It was also stated that States are responsible for the correction of deficiencies and the role of the Regional Office was to work with States in identification, evaluation, classification and prioritisation of deficiencies. The Regional Office also maintains a list of deficiencies and reports to APANPIRG. APANPIRG and its Sub-Groups provide a higher focus on prioritization and monitoring of corrective actions taken by States and other bodies.

14.4 The meeting noted the information provided and discussed the process for reporting of deficiencies. Reports generally come from users through their international associations. In the first instance reports are expected to be dealt with State directly and if unresolved be referred to the regional deficiency list. Removal of an item from the deficiency list is accomplished by the State concerned informing the Regional Office of completion of remedial action and verification by the Regional Office with assistance on occasion by the original reporter.

14.5 The meeting noted the process and considered that it would provide a useful tool in the management of deficiency.

2) Review and update the List of deficiencies in the CNS and MET fields

14.6 The meeting noted that APANPIRG has been given high priority in dealing with air navigation deficiencies. Towards this end the ICAO Secretariat, Sub Groups and Task Force had also intensified their efforts in dealing with deficiencies to assist Stated in eliminating the deficiencies. It was noted that a State Letter was sent by ICAO Secretary General to Ministers responsible for Civil Aviation (State Letter M 6/1-02/79, dated 27 September 2002), attaching the list of deficiencies in the State concerned as identified by the APANPIRG, and requesting the Ministers to resolve the deficiencies through a plan of action and the allocation of the necessary financial and human resources.

14.7 Due to lack of satisfactory progress in resolving deficiencies the ICAO Council expressed serious concern in March 2004 that many deficiencies have persisted for a number of years posing a potential threat to the safety of civil aviation. A State Letter is issued lately to inform the civil aviation authorities the concern expressed by the council and to urge them to develop action plan to correct the deficiencies.

14.8 Review of the deficiencies in the CNS/MET fields indicate encouraging progress made in correcting the implementation problems as follows:

- As a result of actions taken by Bangladesh, India and the ICAO Regional Office and based on action plan developed by the COM Coordination Meeting held in 2003, the long standing deficiency of Dhaka/Kolkata AFTN circuit has been eliminated by implementing the AFTN circuit using 64 Kbps link effective 2 January 2004;

- As a hotline IDD services used for the Dhaka/Kolkata ATS direct speech circuit is meeting operational requirements. Furthermore the existing 64 Kbps link will soon be used for both AFTN and ATS DSC as telecom regulator in Bangladesh agreed to allow both data and voice on the leased channel;

- A high level mission was conducted to Myanmar. Urgent need to overcome the air-ground communication deficiency was brought to the attention of the higher authority in the government. An action plan was developed for implementation by the end of 2004. Action has been taken by the government to implement the action plan;

- A MET Special Implementation Project (SIP) was carried out in 2003 to assist States in eliminating deficiencies related to the provision of SIGMET for volcanic ash. Five States were visited under the SIP and assistance was provided in developing action plans to eliminate the deficiencies;

- A new version of the ASIA/PAC Regional SIGMET Guide was published by the ICAO Regional Office as part of the measure to resolve deficiencies related to SIGMET;

- Special consultations were carried out with India regarding the deficiency related to the issuance of TC advisories by TCAC New Delhi; as a result this deficiency was successfully resolved; and

- A State Letter was issued with MET deficiencies contained in the APANPIRG/14 meeting report in order to receive up-to-date information on the actions taken by States. The response to this letter has been poor, nevertheless it provided some input for updating the list.

14.9 In view of the above, the meeting updated the list of deficiencies as shown in Appendix A3. It was noted that inadequacy of VHF coverage in Dhaka FIR particularly, a small portion in the southern part of the FIR not covered by VHF was delegated to Kolkata ACC to provide ATC service. It was expected that after implementation of the planned RCAG sites to provide full VHF coverage in Dhaka FIR around 2006, Dhaka ACC will provide ATC service in the delegated airspace. Since the lack of VHF coverage was neither causing any operation problem nor had any adverse impact on safety. It was therefore agreed that after verification of the above by the respective administration it would be proposed to withdraw this deficiency from the list. The concerned administrations were requested to confirm the above arrangement by formal notifications to the Regional Office.

14.10 Based on the report received by the Secretariat it was brought to the attention of the meeting that the Mumbai VOLMET broadcast was deficient as it was not broadcasting regularly in the published frequencies. India confirmed that currently the Mumbai station is broadcasting on only one frequency due to transmitter problem. The old HF transmitter will be replaced with the new one within a short time and the required equipments were under installation. In view of the corrective action taken by the administration this item was not considered to be included in the list as deficiency.

14.11 IATA expressed concern on the prolong delay in correcting long standing of air-ground communication problem experienced by airlines in Yangon FIR. It was further stated that in view of unreliable communications, in flight broadcast procedure (IFBP) was introduced requiring pilots to transmit their positions to each other. It was stressed that the problem should be corrected as soon as possible. The Secretariat informed that the implementation of the action plan developed to correct the deficiency has been closely monitored and is followed up regularly.

Agenda Item 15: Future Work Programme

Terms of Reference and Subject/Tasks List of the CNS/MET Sub-Group

15.1 The meeting noted that of the 40 Tasks, 29 Tasks were completed and the completed Tasks were deleted from the List. The meeting reviewed and updated the List. In the updated List the meeting added a new task item 41 relating to the study of available air-ground data links and to develop near term and long-term strategy for the selection of data links for use in the ASIA/PAC region. The updated Tasks List is provided in Appendix A4.

In view of the foregoing the meeting formulated the Draft Decision as follows:

Draft Decision 8/36- Updated Subject/Tasks List of the CNS/MET Sub-Group

That, the updated Subject/Tasks List of the CNS/MET Sub-Group presented in Appendix A4 be adopted.

Agenda Item 16: Any other business

Meeting Documentations

16.1 Under this agenda item the meeting noted with appreciation that the meeting documents were made available in the ICAO website in a timely manner. Most States used the website and used the documents to prepare for the meeting. None of the States informed that they had difficulty in down loading the papers. The meeting encouraged States to submit papers for the next meeting in a timely manner to make it more beneficial to all the participants.

16.2 In order to simplify meeting documentations it was agreed that the CNS and MET papers should be compiled in separate packages for distribution to the participants.

Next Meeting

16.3 It was proposed that the Ninth Meeting of the CNS/MET Sub-Group be held in Bangkok from 11 to 15 July 2005.

ACTION TAKEN ON DECISIONS/CONCLUSIONS OF THE CNS/MET SG/7 IN THE CNS FIELD

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/1	C. 14/12	-	**Conclusion 14/12 - ASIA/PAC Interface Control Document (ICD) for ATN Router** That, the ASIA/PAC regional ICD for ATN Router be adopted and published.	Published in the website and States notified.	Completed
D. Concl. 7-10/2	C.14/13	-	**Conclusions 14/13 - ATN Documentation Tree** That, the updated ATN Documentation Tree be included in the Second Edition of the ATN Planning and Technical Document and forwarded to States.	Included in the Second Edition of ATN Planning Document and published and States notified.	Completed
D. Concl. 7-10/3	C.14/14	-	**Conclusion 14/14 -ASIA/PAC ATN Inter Domain Routing Policy (IDRP)** That, the ASIA/PAC ATN Inter Domain Routing Policy (IDRP) be adopted and distributed to States.	Published in the website and States notified.	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/4	C.14/15	-	**Conclusion 14/15 – Use of Public Internet to support AFTN** That, the guidance material for the use of Public Internet to support low speed AFTN circuits be adopted and circulated for States for use as an interim means pending the outcome of the result of Aviation Use of Public Internet Study Group.	- Provided to the Study Group; - Published in the website and State notified.	Completed
D. Deci. 7-10/5	C.14/16	-	**Decision 14/16 – Revision of the Subject/Tasks List of the ATN Transition Task Force** That, the updated Subject/Tasks List of the ATN Transition Task Force provided in Appendix A be adopted.	Task Force noted the changes made.	Completed
D. Concl. 7-10/6	C. 14/17		**Conclusion 14/17 - Use of SATCOM voice for ATS** That, a) SATCOM voice be used in compliance with existing SARPs; and b) ICAO develop a global policy for the use of SATCOM voice for ATS function.	The task has been assigned to ACP. ACP is looking for more details about the problem statement. State concerned has been advised to furnish details.	On going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
		ANC	*Noted the Conclusion and relevant provisions in Annex 10, and requested the Secretary General to consider developing, if necessary, additional procedures to address the use of SATCOM-voice for ATS.*		
D. Concl. 7-10/7	C.14/18	-	**Conclusion 14/18 - Inclusion of Seoul in MWARA NCA-3** That, the ASIA/PAC FASID be amended in accordance with the established procedure to specify requirement for an aeronautical station in Seoul to provide HF air-ground communication in the MWARA NCA-3 Network.	- A proposal for amendment to the Table CNS-2 of FASID was processed. - States notified of the adoption of the proposal.	Completed
D. Concl. 7-10/8	C.14/19	-	**Conclusion 14/19 – Updated Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region** That, the updated Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region provided in Appendices B and C respectively, to the report on Agenda Item 2.2 be adopted and provided to States.	The updated strategies were published in the website and States notified.	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/10	C. 14/20	-	**Conclusion 14/20 - Near term ADS-B data link selection** That, Mode S Extended Squitter (1090 ES) be used as the data link for ADS-B radar like services in the ASIA/PAC region in the near term.	Task Force is proceeding with the development of implementation plan based on 1090 ES as data link. AN-Conf/11 also endorsed this link for near-term use.	Completed
-	C.14/21	-	**Conclusion 14/21 - Target date of ADS-B Implementation** That States, where necessary to do so, be encouraged to implement "ADS-B out" for ground-based surveillance services in ASIA/PAC Region on a sub-region by sub-region basis with a target date of January 2006.	ADS-B Task Force developing plan for air-ground ADS-B implementation on a Sub-regional basis in an evolutionary manner.	On going
-	C.14/22	-	**Conclusion 14/22 - Needs for development of ICAO SARPs for ADS-B** That, in view of the progress made by States with operational trials for the implementation of ADS-B, ICAO be requested to give priority to: a) the inclusion of positional source data accuracy and integrity requirements for ADS-B services in the appropriate standards; and	ICAO HQ requested to take appropriate action with respect to the global provisions. The Surveillance and Conflict Resolution System Panel (SCRSP) and Separation Panel (SASP) are expected to take appropriate actions.	On going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
			b) development of separation standards for ADS-B surveillance.		
		ANC	*Noted the Conclusion and requested the Secretary General to consider including source data accuracy and integrity requirements in ADS-B standards and also develop separation standards for ADS-B surveillance.*		
D. Deci. 7-10/9	C. 14/23	-	**Decision 14/23 - Revision of the Terms of Reference of ADS-B Study and Implementation Task Force** That, the new Terms of Reference of the ADS-B Study and Implementation Task Force be adopted as shown in Appendix D.	Task Force noted the revised TOR.	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/11	C. 14/24		**Conclusion 14/24 - Preparation for World Radio Communication Conference 2007 (WRC-2007)** That, States, a) assign high priority to aeronautical spectrum management; b) participate in the development of States' position for WRCs at the national level to ensure support to the ICAO position; c) ensure, to the extent possible that, aviation representatives are included in States delegations to the Asia-Pacific Telecommunity (APT) Conference Preparatory Group) meetings and at WRCs; d) to nominate an ICAO designated focal point or contact person for aviation issues related to the WRC-07; and e) ensure participation of the designated focal point or contact person at the ICAO Regional Preparatory Group Meetings for WRC-07, APT Conference Preparatory Group Meetings for WRC-07, and at WRC-2007.	As a follow up action this Conclusion was presented to the 40th DGCA Conference. States have been urged to nominate focal point of contact.	On going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
		ANC	*Noted the Conclusion and requested the Secretary General to continue encouraging the States to participate at various levels in different fora to provide support for the ICAO position at the forthcoming WRC-2007 so as to protect aeronautical frequency spectrum.*		
D. Deci. 7-10/40	C. 14/43	-	**Decision 14/43 – Update Subject/Tasks List of the CNS/MET Sub-Group** That, the updated Subject/Tasks List of the CNS/MET Sub-Group presented in Appendix L be adopted.	Brought to the attention of the Sub-Group.	Completed
D. Deci. 7-10/39	C. 14/46	-	**Decision 14/46 – Amendment to the key priorities for implementation of the CNS/ATM systems for the ASIA/PAC Region** That, the amended list of Key Priorities for implementation of the CNS/ATM systems for the ASIA/PAC Region provided in Appendix B to the Report on Agenda Item 3 be adopted.	Brought to the attention of the Sub-Group.	Completed

ACTION TAKEN ON DECISIONS/CONCLUSIONS OF THE CNS/MET SG/7 IN THE MET FIELD

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/13	C. 14/25	*ANC*	**Conclusion 14/25 - Implementation of the SADIS second-generation system (SADIS 2G)** That, subject to the successful completion of the trials, the APANPIRG endorses the implementation of the SADIS second-generation broadcast (SADIS 2G) *Noted the conclusion and recognized that the transition to SADIS 2G would accrue benefits to States, although there would be an initial cost implication at the system level.*	The implementation of SADIS 2G has been endorsed.	Completed
D. Concl. 7-10/14	C. 14/26	*ANC*	**Conclusion 14/26 - Discontinuation of the current first-generation SADIS two-way VSAT programme** That, the APANPIRG notes the plan to discontinue the current SADIS two-way VSAT programme as of 1 January 2004. *Noted the conclusion and acknowledged that the discontinuation of the current SADIS two-way VSAT programme effective 1 January 2004 constituted and initial step for migration from first to second generation SADIS broadcast system.*	SADIS two-way VSAT programme discontinued 1 January 2004	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/15	C.14/27	-	**Conclusion 14/27 - SADIS strategic assessment tables** That, the ASIA/PAC SADIS strategic assessment tables, as given in Appendix F to the report on Agenda Item 2.2, be adopted and forwarded to the SADISOPSG for planning the future SADIS bandwidth requirements.	SADIS strategic assessment tables forwarded to the SADISOPSG.	Completed
D. Concl. 7-10/16	C. 14/28	-	**Conclusion 14/18 – Use of the SADIS Internet Back-up Service by ISCS User States** That, the ISCS user States be encouraged to consider the use of the SADIS internet-based ftp back-up service as an interim solution for reception of WAFS products and OPMET data in the event of difficulties in meeting the ISCS transition schedule. *Note: The use of the SADIS internet-based back-up service would require a software for visualization of the WAFS products.*	ISCS user States have been informed of the availability of the SADIS ftp back-up service.	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/17	C. 14/29		**Conclusion 14/29 – Cost Recovery for the utilization of WAFS by the States** That, ASIA/PAC States be encouraged to include the costs associated with the receipt and provision of WAFS products, in particular, the mandatory SADIS charges, the cost for the replacement or upgrade of WAFS workstations and software required for the transition to the GRIB and BUFR coded WAFS products, the upgrade and maintenance of the SADIS/ISCS VSAT equipment, in the cost recovery for the meteorological services provided in their territory via the air navigation service charges. *Note: The recovery of the costs should be in accordance with ICAO principles and policy on the air navigation service charges.*	States notified.	Completed
D. Concl. 7-10/18	C. 14/30	-	**Conclusion 14/30 – States' Actions for the Migration to the Operational Use of GRIB and BUFR coded WAFS Products** That, a) ASIA/PAC States be urged to start the necessary preparations for the migration to the operational use of GRIB and BUFR coded WAFS products as a matter of	States have been notified on a number of occasions on the need to upgrade their systems for receiving/processing WAFS data. The migration process is still to be finalized.	On-going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
			urgency, if they have not already done so; b) States having difficulties in the migration to the operational use of GRIB and BUFR coded WAFS products be encouraged to urgently approach WMO for assistance under the WMO Voluntary Cooperation Programme (VCP). *Note: In order to expedite WMO consideration of VCP requests, States are encouraged to contact potential donors and subsequently inform WMO.*		
D. Concl. 7-10/19	C. 14/31	-	**Conclusion 14/31 – Automatic Production of SIGWX Charts from BUFR Coded WAFS Products** That, the WAFSOPSG be invited to consider the requirement for automatic production of SIGWX charts for the standard ICAO chart areas from BUFR coded WAFS products to be included into the set of minimum requirements to be achieved by the WAFS workstation manufacturers.	The conclusion has been considered by the first meeting of the WAFS Operations Group (WAFSOPSG/1, Lima, September 2003)	Completed (Action has been overtaken by WAFSOPSG)

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/20	C. 14/32		**Conclusion 14/32 – GRIB/BUFR Training** That, the SADIS and ISCS provider States be invited to provide further training on the operational use of GRIB and BUFR coded WAFS products for the States in the ASIA/PAC Regions in coordination with ICAO and WMO. *Note: It is desirable that the above training is organized conjointly by the SADIS and ISCS provider States for both SADIS and ISCS user States in the ASIA/PAC Region in late 2004/early 2005.*	Consultations between SADIS and ISCS provider States carried out. Training event expected ~~December 2004~~. January 2005.	On-going
		C	*Noted the conclusion and requested the Secretary General to invite the SADIS and ISCS Provider States to arrange, in coordination with ICAO and WMO, training on the operational use of GRIB- and BUFR-coded WAFS products for the States in the Asia/Pacific Regions during 2004/2005.*		

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/22	C. 14/33		**Conclusion 14/33 – Amendment of regional procedures related to WAFS in the ASIA/PAC Basic ANP and FASID** That, the ASIA/PAC Basic ANP and FASID (Doc 9673) be amended as indicated in Appendix G to the report on Agenda Item 2.2.	Amendment proposal is being issued.	On-going
D. Concl. 7-10/23	C. 14/34	-	**Conclusion 14/34 – Notification for significant changes in the WAFS operation** That, WAFSOPSG be invited to develop adequate notification procedure for significant changes in the WAFS operation to ensure that all States/users concerned are informed with enough lead time to prepare for those changes.	WAFSOPSG/1 meeting adopted Conclusion 1/6 on the subject	Completed
D Concl. 7-10/25	C. 14/35	-	**Conclusion 14/35 – Inclusion of 9-hour TAF in the ROBEX exchange** That, the ASIA/PAC States who are issuing 9-hour TAF, be invited to include these bulletins into the regular exchange under the ROBEX scheme.	State letter issued. OPMET/M TF/2 meeting created a new ROBEX Table for the 9-hour TAF	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/27	C. 14/36	-	**Conclusion 14/36 – ASIA/PAC Regional SIGMET Guide** That, a) ICAO publish the new edition of the ASIA/PAC Regional SIGMET Guide in accordance with the established procedures; and b) based on the guidance provided in the ASIA/PAC Regional SIGMET Guide, the States be invited to review the operations of the designated MWOs and ensure that SIGMET messages are issued in full compliance with the Annex 3 provisions and the requirements stated in the ASIA/PAC Regional ANP.	SIGMET Guide published in September 2003 and sent to all States. The Guide is published on ICAO web site.	Completed
D. Concl. 7-10/28	C. 14/37		**Conclusion 14/37 – Amendments to the SIGMET format** That, ICAO be invited to consider amendments to the SIGMET format specified by Annex 3, in particular to the part of the SIGMET message related to the geographical location of the weather phenomenon, for which the SIGMET is issued, aimed at facilitating the preparation of SIGMET information and further standardization of the message format.	Task undertaken by the ICAO HQs	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
		ANC	*Note: Examples of proposed changes to the SIGMET format are shown in Appendix I to the report on Agenda Item 2.2.* *Noted the conclusion and requested the Secretary General to develop amendments to the SIGMET format specified by Annex 3, in particular to the part of the SIGMET message related to the geographical location of the weather phenomenon, aimed at further standardization of the message format.*		
D. Deci. 7-10/30	D. 14/38	-	**Decision 14/38 – Task Force on the implementation of volcanic ash and Tropical cyclone advisories and warnings (VA/TC Implementation TF)** That, a) the Volcanic Ash Task Force, established by Decision 13/31 of APANPIRG be disbanded; and b) a Task Force on the implementation of the volcanic ash and tropical cyclone advisories and SIGMETs in the ASIA/PAC Region (VA/TC Implementation TF) be established with terms of reference, work programme and composition as shown in Appendix J to the report on Agenda Item 2.2.	VA/TC Implementation TF established	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/31	C. 14/39	-	**Conclusion 14/39 – Harmonization of the format of volcanic ash and tropical cyclone advisories** That, IAVW Operations Group (IAVWOP SG) be invited to review the format of the volcanic ash and tropical cyclone advisories and propose changes aimed at harmonizing the format of those elements which are common for both types of advisory messages.	The subject has been addressed by the IAVWOPSG/1 meeting and	Completed
D. Concl. 7-10/32	C. 14/40	-	**Conclusion 14/40 – Amendment to FASID Table MET 1B in regard to the service provided by the meteorological watch office Wellington** That, FASID Table MET 1B be amended by adding a note for MWO Wellington, New Zealand, as shown in the Appendix K to the report on Agenda Item 2.2.	Amendment proposal issued	On-going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
D. Concl. 7-10/33	C. 14/41	-	**Conclusion 14/41 – Implementation of the requirement for TC advisories by TCAC New Delhi** That, India, as TCAC Provider State, be invited to implement, as a matter of urgency, the requirement for issuance of TC advisories by TCAC New Delhi as specified in the ASIA/PAC Basic ANP and FASID (Doc 9673), following the provisions of Annex 3, regarding the format of these advisories.	Communication with the Indian Meteorological Department carried out and the TCAC New Delhi started issuing TC advisories from the beginning of 2004	Completed
D. Concl. 7-10/34	C. 14/42	*ANC*	**Conclusion 14/42 – Further development of the ICAO provisions for the tropical cyclone advisories and SIGMETs** That, ICAO be invited to consider further development of the Annex 3 provisions related to the format and content of the tropical cyclone advisories issued by the Tropical Cyclone Advisory Centres (TCAC) and SIGMETs for tropical cyclones issued by the meteorological watch offices (MWO). *Noted the conclusion and requested the Secretary General to consider further development of the Annex 3 provisions related to the format and content of the tropical cyclone advisory centre and SIGMETs for tropical cyclones issued by the MWO*	Task undertaken by the ICAO HQs.	Completed

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
	C. 14/44		**Conclusion 14/44 – Application of Mode-S data link in automatic weather reporting** That, ICAO be invited to consider the application of the Mode-S data link in automatic air-reporting as an alternative to ADS over areas covered by surveillance radars and to consider ways to facilitate its implementation in the ASIA/PAC Region.	Task undertaken by ICAO HQs.	Completed
		ANC	*Noted the conclusion and called upon the Secretary General to consider the use of Mode-S data link in automatic air reporting.*		
D. Concl. 7-10/37	C. 14/45		**Conclusion 14/45 – Fostering of exchanges between MET and ATM** That, a) the MET Authorities/Providers of the States, be encouraged to continually assess with the corresponding ATM authorities the requirements for MET information with the aim of developing new products/information to support the ATM, bearing in mind the potential costs and benefits involved; and b) ICAO be invited, in coordination with WMO, to organize a MET/ATM coordination seminar in ASIA/PAC Region in 2004, to foster the exchanges between the MET and ATM experts in	Initial coordination with WMO undertaken	On-going

Report Ref. Deci./Concl. Of Sub-Group	Report Ref. Deci./Concl. No. APANPIRG	Action Taken by ANC/Council	Decision/Conclusion/ Action Taken	Action Taken by States/ICAO	Status
			order to facilitate further development of the MET component of the CNS/ATM systems in the ASIA/PAC Region. *Noted the conclusion and invited the Secretary General, in coordination with WMO, to organize a MET/ATM coordination semina in the ASIA/PAC Region during 2004.*		
		C			

OUTSTANDING CONCLUSIONS/DECISIONS IN THE CNS/MET FIELD

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
C 5/19	*C*	Need for technical assistance to support WAFS implementation in the ASIA/PAC Regions That, ICAO initiate action to provide technical assistance in terms of equipment and training of personnel under the Technical Co-operation Programme to those States that are in need of assistance to receive WAFS products by satellite broadcast. 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. –UK provided GRIB/BUFR training for SADIS User States in ASIA/PAC region in November 2002. Second GRIB/BUFR training for ISCS and SADIS Users is planned for late 2004	On-going 2005
C 9/18		Operational efficacy of OPMET messages That, ~~a)~~ICAO carry out a survey on the operational efficacy of the ISCS/2; and ~~b)~~Results of the survey be made available to the ISCS/2 provider Stat and reported to the COM/MET/NAV/SUR SG/3 Meeting.	–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.	2004-2005
C 10/23		Revision of the ROBEX Scheme That, in order to facilitate distribution of the ASIA/PAC OPMET information to the WAFC 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. Task to be carried out by OPMET/E TF. OPMET/E TF developed an action list in regard to the further optimization of ROBEX Scheme.	~~On-going~~ ~~2003~~ Completed
C 11/33		**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.	The SIP Project Proposal will be put forward for Council approval in 2001. The SIP Proposal is being revised in order to reduce the cost and will be put forward for Council approval in 2002.	~~On-going~~ ~~2003~~ Completed

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
	C	Noted the conclusion and that such project would be put forward for Council approval through established procedures.	The revised SIP was approved by the Council for implementation in 2003. Mission to Japan and Philippines completed by May 2003. SIP was conducted in 2003	
C 12/25		**Application of EUR OPMET update procedure in the ASIA/PAC Regions** That, the procedure similar to the EUR OPMET update procedure be developed and introduced in the ASIA/PAC Regions.	The procedure is to be developed by the OPMET Exchange Task Force. OPMET/M Task Force is working on developing appropriate update procedure for ASIA/PAC Region	On-going
C 12/26		**Tropical cyclone advisories with the data designator "FK"** That, the TCACs Honolulu, Miami, New Delhi, Darwin, Nadi and Tokyo, designated to provide the service in the ASIA/PAC Regions, issue the advisories using the data designator "FK" and ensure the routing of these bulletins to aviation users and London Centre for uplink to the SADIS broadcast. Note: Requirement for Honolulu TCAC in the ASIA/PAC Regions is covered by Conclusion 12/33 formulated by the meeting.	Implemented by Japan and USA. Other TCACs have been notified through WMO Tropical Cyclone regional bodies. The TC advisories with data designator "FK" and standard format awarding to Annex 3 have been implemented by all TCACs in ASIA/PAC except New Delhi. TCAC New Delhi introduced "FK" advisories in January 2004	~~On-going~~ Completed

Appendix A

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
C 12/32	*ANC*	**Volcanic Ash Advisory and SIGMET in graphical format** That, ICAO give consideration to further improvement of the format in which the graphical advisory should be issued by VAACs and development of proposals for the format of a graphical SIGMET for volcanic ash, including the necessary guidance regarding procedures for dissemination of information. *Noted the conclusion and requested the Secretary General to consider further improving the format of graphical advisories to be issued by VAACs and develop proposals for the graphical format of SIGMET messages for volcanic ash, including the necessary guidance regarding procedures for dissemination of information.*	The recommendation for BUFR-coded graphical volcanic ash advisories to be included in the Amendment proposal 73 to Annex 3. The task is undertaken by the IAVWOPSG	~~On going~~ Completed
C 13/12		**Need to monitor AFTN circuit performance** That, States concerned closely monitor performance of the following AFTN circuits and coordinate upgrading the circuits capacity, in accordance with the AFTN plan. 1. Colombo/Male 2. Colombo/Singapore 3. Mumbai/Colombo 4. Mumbai/Nairobi 5. Kuala Lumpur/Chennai 6. Tokyo/Singapore 7. Tokyo/Moscow	States concerned were requested to monitor loading condition and upgrade circuit capacity as specified in Table CNS-1A AFTN Plan. Consequently, - Colombo/Male – upgrading planned for 12/0~~3~~4 - Colombo/Singapore – upgraded to 9600bps 12May03 - Mumbai/Colombo – upgraded to 64 kbps 19Mar.03 -Mumbai/Nairobi – India is ready to upgrade. International coordination is being under taken. - Kuala Lumpur/Chennai – upgraded to 9600 bps in April 03. - Tokyo/Singapore – upgraded to 9600bps 15Jan03; - Tokyo/Moscow – States closely monitoring circuit loading. Coordination being carried out between States concerned for upgrading the circuit.	Ongoing

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
			Colombo/Male, Mumbai/Nairobi and Tokyo/Moscow are being monitored.	
C 13/14		**Conclusion: 13/14 - ATN Documentation Tree** That, the ATN Planning Document be published in a loose-leaf form to include future amendments to the Document; and the ATN Documentation Tree provided in Appendix B to the report on Agenda Item 2.2 be adopted and included in the ATN Planning Document.	Documentation tree was further updated by the Fifth ATN Transition Task Force meeting held in June 2003. It will be included in the ATN Planning Document in accordance with Conclusion XX of APANPIRG/14 Documentation tree further updated by the Sixth ATN Transition Task Force meeting held in April 2004 and posted on the ICAO APAC web site as a part of the ATN planning document.	~~To be completed in 2003~~ Completed
C 13/23		***Process of Review and Notification of Differences*** That, States establish a procedure with assistance of a database for review of SARPs and notification of differences to Annexes in a timely and comprehensive manner.	A possibility of conducting a special implementation programme (SIP) is being explored. SIP on the subject approved by the Council and will be conducted by the end of 2004	Ongoing

Appendix A

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
C 13/30		**Regional survey on the current status and future plans of States to process the MET component of ADS Reports** That, ICAO carry out a regional survey to assess the current status and future plans of the States in the ASIA/PAC Regions to process the MET component of the ADS message and forward the data to the WAFCs and to assess if the data is quality controlled.	The Survey is to be carried out by the end of 2003. The survey was conducted in May and June 2004	~~On-going~~ Completed
C 13/32	C	***QA MET seminar for ASIA/PAC Region*** That, ICAO, in coordination with WMO, organizes a seminar on the quality assurance in the provision of meteorological services to aviation in the ASIA/PAC Region during 2003. **Council:** *Noted the conclusion and recognizing that in accordance with the Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization (WMO) (Doc 7475) this conclusion should be addressed to WMO, requesting the Secretary General of WMO to arrange, in coordination with ICAO, training on quality assurance for provision of meteorological services to aviation in the ASIA/PAC Region after 2003.*	Action taken by the HQs. WMO has been invited to organize the seminar in coordination with ICAO. Hong Kong, China, proposed to host the seminar, subject to confirmation by WMO. WMO was invited to organize the QA seminar. Currently planned for October 2004 at Hong Kong Observatory.	On-going

Report Reference Concl./Dec. No.	Action by ANC/Council	Decision/Conclusion/ Action Taken	Action by States/ICAO	Status
C 13/35	ANC	**Amendment to the Statement of BORPC** That, ICAO is invited to consider amendment to the MET part of the Statement of BORPC, as shown in Appendix A to the Report on Agenda Item 2.4.	The task of revising the BORPC will be initiated immediately after the 11th Air Navigation Conference in October 2003 during which the ATM operational concept will be considered. Task is being carried out by the ICAO HQs	Completed ~~On-going~~
C 13/40		**Selection of GPS receiver standard for GNSS implementation** That States, ~~a)~~should give consideration for future GNSS operational approvals and associated operational implementation based on the TSO C145/146 receiver standard; and b) use of TSO C129 remains a valid standard but should not be considered as the basis for future implementation of GNSS.	The Conclusion was brought to the attention of States. States notified	~~On-going~~ Completed

AMHS NAMING REGISTRATION FORM

DOCUMENTATION OF AMHS MTA AND END-USER NAMES

Explanation of the Table 1

Legend:

ID:	Numbering scheme where each naming domain is assigned an ordinal number with each user on the MTA a sub-ordinate number.
AMHS Domain:	The ATN AMHS name prefix (management domain) as defined in ICAO Doc. 9705. There are two formats of the AMHS name prefix, XF and CAAS.
MTA Name:	The name of the MTA hosting the AMHS user.
AMHS User Name:	The 8-character user name.
Domain Type:	The format of the AMHS name used. Values are limited to XF or CAAS.
Description of User Name:	
Point of Contact:	The person or office to contact about further information about this entry.
Location:	The physical location of the system. This may be either an address or an AFTN location identifier.

ID	AMHS Domain	MTA Name	AMHS User Name	CAAS or XF	Description of User Name	Point of Contact	Location
1	C=XX, ADMD=ICAO, PRMD=K, O=AFTN,	kslcmta		XF		Hoang Tran	USA
1.1			KSLCATNX		AMHS Operator		
1.2							
1.3							
1.4							
1.5							
1.6							
1.7							
1.8							

Table 1 – Documentation of AMHS MTA and End-User Names

AMHS NAMING REGISTRATION FORM

DOCUMENTATION OF AMHS MTA

Explanation of the Table 2

Legend:

MTA ID:	Numbering scheme where each entry is assigned an ordinal number.
MTA Name:	This field is used to provide the MTA name used in AMHS BINDs.
Element ID:	This field is the linkage between Table 1 and Table 2 and is the ID field from Table 1.
NSAP:	This field is used to indicate the NSAP assigned to the MTA.
Point of Contact:	The person or office to contact about further information about this entry.

MTA ID	MTA Name	Element ID	NSAP	Capabilities	Point of Contact
1	kslcmta	1	47002781555341000101010101000002020203 01	Basic service	Hoang Tran
2					
3					
4					
5					
6					
7					

Table 2 – Documentation of AMHS MTA

International Civil Aviation Organization
Asia and Pacific Office

Asia/Pacific Regional ATN Implementation System Management Operational Procedures

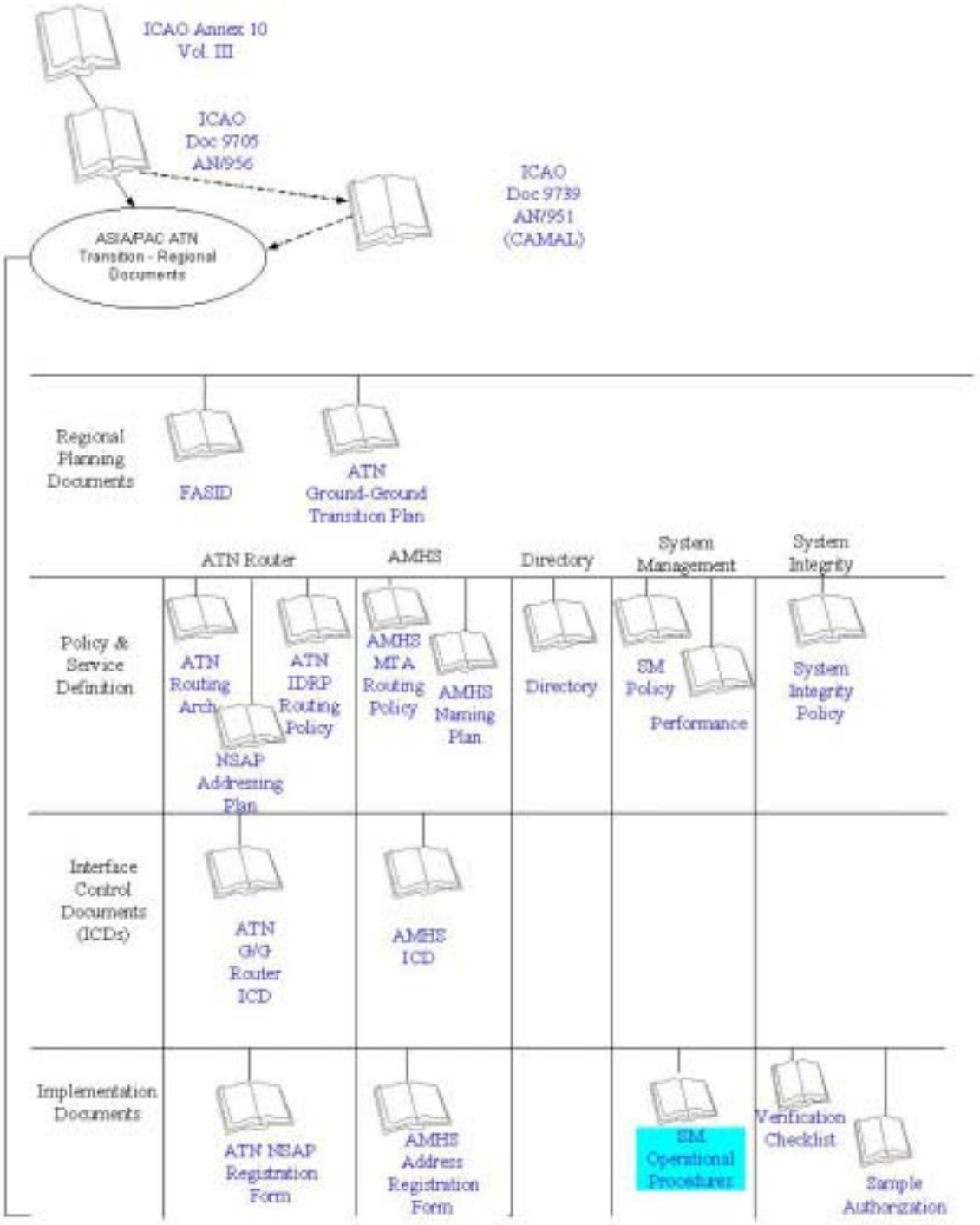
SUMMARY

This document is intended to provide initial direction and guidance in the identification, development, and selection of ATN administrative management tools, agreements and documents necessary to facilitate and continue operation required for transition from current systems and methods to the ATN.

Version 1 – April 2004

Table of Contents

1.0 Location in Documentation Tree



2. Introduction:

The Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) develops documents that will facilitate and guide the Asia and Pacific regions in the introduction and implementation of ATN in the region. This document is developed as a reference guideline for the introduction of necessary administrative ATN management guidelines and documents supporting the development, deployment, and administrative operation of the ATN/AMHS. In-depth technical provisions and specifications that support ATN management are referenced but not included and considered beyond the scope of this document.

ICAO SARPs, technical documentation and CAMALs effectively describe the technical requirements for ATN ***system*** management and ***system*** conceptual operations. It is the intent of this document to identify documents and policies that will facilitate the effective deployment and continued efficient operation of the ***service***.

2.1 Objectives

The objective of this document is the facilitation and establishment of ATN management practices that augment operational practices, policies, and procedures within the region.

2.2 Scope

Scope includes:

- Introduction of applicable management concepts
- Establishment of documents governing ATN ***service*** management
- Activities performed
- Definition of management information

2.3 References

References include:

- Manual of technical provisions for the ICAO ATN (Doc 9705-AN/956) Third Edition
- ICAO ATN CAMAL (Doc 9739-AN/961)
- ISO/IEC and ITU-T International standards for the OSI environment

2.4 Definitions for the purpose of this document:

- ***Administration*:**
  An entity that governs and controls most aspects associated with the support and operation of specific business functions.

- ***Application***
  A practical use of software (computer code) designed and written to achieve specific or multiple tasks employing physical elements to accomplish the direction.
  ***Authority*:**
  An ***Administration***, ***Institution***, or individual that has the weight to govern and direct compliance with guidelines and directives.
- ***Boundary device*:**
  A ***system*** element or device that is located logically between and used by multiple ATN ***system*** owners or operators**.** The efficient operation of the ***boundary device*** could effect the efficient operation of more than one ***domain***. Simply a device such as a router shared by multiple ***domains***.
- ***Domain*:**
  A set of resources under the control of a single entity.
- ***Institution*:**
  A single regional body having ultimate responsibility for operation and compliance of the Region. ***Institutions*** may delegate, by agreement, responsibility for actual ***administration***. This does not imply that ***Institutions*** are managers of a hierarchy of managers.
- ***Organization*:**
  An ***Administration*** that controls a set of resources that support, provide, and operate a ***service***, such as an ATN BIS router.
- ***Participant***:
  An ***Administration***, ***Institution***, ***system*** owner, ***system*** operator, or agency that connects and operates an ATN ***system*** in the global, or regional network environment, ATN ***system*** owners or operators.
- ***System*:**
  A union of physical and software elements designed and maintained to perform specific tasks and provide ***service***.
- ***Service*:**
  The overall result achieved from the consolidated interaction of ***applications,*** operational ***administrations***, and physical elements providing support of commerce, and safe and efficient air traffic management. What is provided to users and recipients of ATN systems by the operators and owners of the ATN those ***systems***.

3.0 General Requirements for ATN *Service* Management

Performance of the ATN depends on the effective and efficient exchange of ATN information derived from machine sources as well as the operational procedures and guidelines of those using, operating and maintaining the ATN ***systems***. To properly monitor and maintain the ATN to provide the necessary quality of ***service*** (QoS) general provisions of what is exchanged in what manner and when must be determined and agreed. General requirements for ***service*** management should be defined. There is a minimum set of ***systems*** management requirements which applies to each type of ATN

system (End ***System*** (ES), Boundary Intermediate ***System*** (BIS), Backbone Boundary Intermediate ***System*** (BBIS), Intermediate ***System*** (IS), etc.).

In general:

- ***System*** management events shall be logged locally for subsequent processing report generation and performance requirements.
- ***Systems*** shall have the capability of notifying local ***systems*** of relevant events to ***systems*** management ***subsystems***.
- ***Systems*** shall have the capability to share information among ***domains*** internally and externally to the administrative area.
- ***Systems*** management shall have the capability to manually and automatically configure ATN elements to optimise performance and mitigate failures.
    - This is a local matter for independent ***domains***.
    - Boundary intermediate ***systems*** (BIS) will require some designation of responsibility for configuration, monitoring, and intervention between independent ATN ***systems***.

4.0 Supporting Management and Implementation Agreements

These are agreements developed within and between ATN ***administrations*** that formalize the purpose of ICAO Standards and Recommended Practice concerning ***system*** management in the ATN Global environment.

4.1 ***Service*** Level Agreement (SLA) definition;

- Those documents developed between and internally among ATN ***system*** owners or operators (***domains***) that identify and commit the ATN ***system*** owners or operators to effective and efficient management and operation of the ATN once commissioned. These documents minimally will be bilateral and with the expansion of ATN expected to be multilateral.
- **See Example: Appendix A**

4.2 Memorandum of Agreement (MOA) definition;

- Documents developed between Authorities and other ATN ***system*** owners or operators governing requirements and commitments that promote the efficiency of the ***service*** and provide information necessary to achieve a mutually agreed objective or commitment.
- **See Example: Appendix B**

Recommendation: ATN ***system*** owners and operators shall develop Memorandum of Agreement to support efficient operation and maintenance of deployed and operational ATN elements. Critical points-of-contact and organizational roles and responsibilities should be defined and documented. Equipment should be described and methods of restoration, testing, and coordination clearly described, agreed and documented.

Recommendation: ATN ***system*** owners or operators shall develop and share ***Service*** Level Agreements between independent ***domains***, states, and ***service*** providers to facilitate performance and restoration.
Recommendation: SLA's shall be developed internally within ***domains*** to assure ***domain*** performance supports and makes possible the global ATN.
Recommendation: ***Service*** level agreements (SLA) should depict the ***domain*** responsible for configuration, monitoring, and intervention of shared ***boundary devices*** (routers) utilized by the entire ATN. This does not necessarily designate maintenance or repair responsibility only the operation and configuration in the dynamic in-***service*** environment.

4.3 Technical Memorandum of Cooperation (TMC) definition;

- Documents developed bilaterally, and multilaterally governing the commitment and responsibility of ATN ***system*** owners or operators during the development, implementation, and testing phases of the ATN deployment before operational commissioning. These documents will logically be replaced by SLA's and MOA's governing responsibility after operational integration and commissioning.

Recommendation: States and ***Organization***s that develop and deploy ATN ***systems*** in the Asia Pacific region should develop and publish TMC's that outline their activities and formalize their intent.
Recommendation: Achievements, problems, and lessons learned from activities associated with the TMC should be published and shared among interested parties

5.0 Managing Legacy *Systems*

To meet fully the requirements to provide distributed ***systems*** management across the full range of ATN ***systems*** that comprise the ATN; it is necessary to integrate the management of legacy (proprietary) ***systems***.

Legacy (proprietary) ***systems*** are characterized by their use of management ***systems*** based on non-conformant protocols and interfaces. Obsolescent legacy ***systems*** can fail to conform to ATN standards and practices, but transitionally they require consideration.

6.0 Informational Knowledge Base *System* Management Elements for ATN:

6.1 Information Objects: Objects refer to physical elements such as routers, hubs and switches and also includes administrative information such as telephone numbers, primary offices of responsibility, mailing addresses, and priorities of preemption. Many of these items can be maintained as Informational Objects in the Management Information Base (MIB), and Cross-***Domain*** MIB (CDMIB) of ***system*** management ***application***s. This information can be shared and distributed by cross-***domain*** distribution of Informational Objects.

ATN ***system*** owners or operators responsible for ATN management shall make available to other ATN ***administration***s these informational items.

- Points of Contact
- Offices of responsibility
- Generation of performance reports
- Publication of performance reports
- Distribution of performance reports

Recommendation: Principle and supporting ***Organization***s, businesses, and states should at a minimum gather, retain, and keep current the items identified as Basic Operational Knowledge Base Elements. Availability and currency of these items will facilitate repair, and efficient performance of the ATN ***service***.

7.0 Summary of Recommendations:

Recommendation: ATN ***system*** owners or operators will develop ***Service*** Level Agreements between independent ***domains***, states, and ***service*** providers to facilitate performance and restoration.

Recommendation: SLA's will be developed internally within ***domains*** to assure ***domain*** performance supports and makes possible the global ATN.

Recommendation: ***Service*** level agreements (SLA) should depict the ***domain*** responsible for configuration, monitoring, and intervention of shared ***boundary device***s utilized by the entire ATN. This does not necessarily designate maintenance or repair responsibility only the operation and configuration in the dynamic in-***service*** environment.

Recommendation: States and ***Organization***s that develop and deploy ATN ***systems*** in the Asia Pacific region should develop and publish TMC's that outline their activities and formalize their intent.

Recommendation: Achievements, problems, and lessons learned from activities associated with the TMC should be published and shared among interested parties

Recommendation: Participating states should develop Memorandum of Agreement to support efficient operation and maintenance of deployed and operational ATN elements. Critical points-of-contact and organizational roles and responsibilities should be defined and documented. Equipment should be described and methods of restoration, testing, and coordination clearly described, agreed and documented

Recommendation: Principle and supporting ***Organization***s, businesses, and states should at a minimum gather, retain, and keep current the items identified as Basic Operational Knowledge Base Elements. Availability and currency of these items will facilitate repair, and efficient performance of the ATN ***service***.

8.0. Examples of Management Procedural Agreements.

8.1. Example *Service* Level Agreement

Appendix A

Service level agreement

Table of Contents

***Service* Level Agreement:**

1 Purpose

This agreement is between **ATN LOCATION A and ATN LOCATION B** this document outlines ***service*** level roles, responsibilities, and objectives of **ATN LOCATION A and ATN LOCATION B** in support of the **ATN.**

1 Scope of *services*

Location A and Location B support the day-to-day operations of **ATN** through the maintenance and support of hardware and software elements, objects and ***application***s that comprise the **ATN** and the physical and operational interfaces between **ATN** individual ***domains*** that operate in an interdependent environment.

1.1 Service* offerings include*:

• ***Systems*** Operations	Access to and operation of a network data distribution environment for the ATN, including data handling, switching, routing, message handling, message and information distribution, backup, and recovery
• Backups	Provision for regular backups
• Recovery	All hardware and software problems will be covered by operational management agreements. Data recovery, when required, will be completed in accordance with ATN recommended standards and practices.
• Infrastructure	Shall be maintained and operated in accordance with ATN recommended standards and practices.
• First Level Support	Provisions for operational support of existing ***application*** software, and hardware to facilitate troubleshooting and correction of information management and information distribution problems
• Consulting	Provide expertise to support ATN operation and consult on operational requirements, performance objectives and planning needs

2 Performance goals

Performance guidelines and what are agreed to by the signatories of this agreement that will determine these goals.

3 Performance measures

Performance guidelines and what are agreed to by the signatories of this agreement that will determine these goals.

4 Constraints

Performance guidelines and what are agreed to by the signatories of this agreement that will determine these goals.

5 Maintenance schedules

- Routine posted and shared maintenance schedules
  - Hours of Operation
  - Hours of available technical support
- As scheduled and agreed in advance with affected units

6 Terms of agreement

The signatures of this document indicate agreement to its content, that it is valid, has achievable objectives, and represents the intent of the parties to meet the ***system*** needs, report performance, and achieve cooperative performance goals as identified above. This document is controlled by **Location A, responsible director and Location B, responsible director.** These directors or their duly authorized representatives are the primary signatories of this agreement. Any modifications to this agreement require the review and approval of both parties. Inputs relative to the content or distribution of this document should be forwarded to the director(s).

This document will remain in effect until replaced with an updated version. It will be reviewed annually for currency, accuracy, and completeness. The next review is scheduled for **(Month, day).**

7 Approval

Signature	(Print Name)	Date

Title/Position, ***Organization***, and location.

Signature	(Print Name)	Date

Title/Position, ***Organization***, and location.

8 Addendum A: Technical support availability schedule

Described here times, dates, hours, and offices that supports the operation of the ***service***. Preferred Points of Contact POC's are responsible offices and ***Organization***s rather than individuals.

9 Addendum B: Response and restoration commitments

Agreement between the parties in regard to mutually agreed response and restoration of failed elements or processes. This is the basic commitment of the parties regarding their obligation to respond and restore degraded operations or elements.

10 Addendum C: Critical reports

Described here the performance reports that will be produced by ATN ***system*** owners or operators, frequency, and distribution. How the reports will be delivered, to whom and in what manner, method or form.

11 Addendum D: Performance Measure

Described here the performance measures that the parties mutually agree to apply as a basis to determine effective operation of resources within the local ***administration*** and the resources shared to achieve the global goal.

12 Addendum E: Contact list

A list of hierarchical contacts, timeframes for contact nature of contact, and time to escalate to the next level for action.

8.2. Example Memorandum of Agreement

Appendix B

Organization A
Network Operations Center

And

Organization B
Network Operations Center

Memorandum of Agreement

Operational Procedures
For
ATN Network
Management, Operation, and Maintenance

Month, Day, Year

TABLE OF CONTENTS

Appendix A Primary Points of Contact.

Appendix B Escalation Points of Contact.

1.0 INTRODUCTION

Network management and operation ***services*** between ***Administration A*** and ***Administration B*** Network Operations Center (NOC) whether government, civilian, contractor, vendor, ***service*** provider, or others require coordination, information sharing and clearly defined responsibilities to ensure that ***services*** are effectively transported and maintained to meet user requirements. The recognized criticality regarding delivery of aviation related information insures safety and cost effective operation and the significance is vital. As part of this effort, the following memorandum of agreement outlines and describes the required coordination among the ***administration***s and the responsibilities of each ***administration***.

1.1 Purpose

This document establishes the division of responsibilities and required procedures between ***Administration A*** and ***Administration B*** for the management, operation, and maintenance of information and messages transported between each network. It is understood that any reference to ***Administration A*** or ***Administration B*** in the context of this document, shall include any agent (government, civilian, contractor, vendor, ***service*** provider, and others) designated by the ***Administration***s to act on their behalf for the purpose of fulfilling this agreement.

This document identifies whom, when, and under what conditions allowable actions can be taken. Typical actions include:

- Troubleshooting
- Trouble reporting
- Maintenance actions (preventive, routine scheduled, emergency)
- Division of maintenance authorization
- Coordination of maintenance activities
- Changes to the network
- Configuration of the network
- Failure or non-availability notification
- Monitoring of traffic loading
- ***System*** back-up procedures and the conditions under which they are to be invoked are also established in this document.

The actions described above require the existence of a single point of contact for ***Administration A*** and ***Administration B.*** ***XXXXXX*** shall be the single point of contact for provisioning maintenance and network ***services*** for ***Administration A.*** ***XXXXXX.*** ***YYYYYY*** shall be the ***Administration B*** single point of contact. ***XXXXXX*** coordinate activities with ***YYYYYY,*** vice-versa.

1.2 Scope

This document will describe the following, as they relate to ***Administration A*** and ***Administration B*** networks:

- Network Overview
- Maintenance and Trouble Reporting
- Network Security and Access
- Technical Assets

1.3 Reference Documents

- ICAO SARP's
- Technical Manuals
- Technical documentation related to the equipment and ***application***s in use by the ATN ***system*** owners or operators

2.0 *Administration* A Network Overview

The ***Administration A*** Network is a ***system*** of leased and owned transmission facilities connecting network equipment resources (Routers, Hubs, Switches, etc.). The network (equipment and telecommunication lines) has a mean time between failure (MTBF) of .9999 or better. The operational management ***system*** is **XXXXX version x.x.** The network is centrally managed at **LOCATION A and Alternate Location B (if provided).**

2.1 Transmission Facilities

The network nodes are linked together with a minimum of two trunks creating a diverse network.

2.2 Clocking Scheme

Clocking for the ***Administration*** A Network is as follows:

- Number of Master Clock Sources.
- Describe how the clocking is distributed.

2.3 Operational *Domains*

In order to maintain operational integrity, ***domain*** separation is implemented between nodes in a particular area or between networks. Firewalls allow seamless communications among the ***domains***, but prevents non-certified, authenticated, or authorized operators from accessing the other ***domains*** within the ATN Network, and total isolation between the ATN and non-ATN networks.

The capability should exist to allow inter-nodal and inter-***domain*** operator and maintenance access. This capability is negotiated between **ATN *Administration*s** and other non-ATN administrators as required supporting mission requirements while maintaining operational integrity concerns.

2.4 Preemption and Priority Scheme

With the use of routing algorithms, the ATN shall always attempt to place a call over a primary path first. A primary path is defined as the shortest route, with the least nodal hops. In the event, the primary path is not available; the network will place the call over an alternate route. Call routing on the ATN will be automatic,

requiring the establishment of a priority and preemption scheme. See Table 1a for the list of ATN priorities.

Table 1a.

ATN Network
Call Priority/Preemption Plan

Service Category	Priority/ Preemption	Types of ***Services***
Lowest priority = 0 Highest priority = n		
1. Critical (.99999 Availability, 6 second restoration)		
Priority 1 (Primary)	13	
Priority 1 (Backup)	12	
Priority 2 (Primary)	11	
Priority 2 (Backup)	10	
Priority 3 (Primary)	9	
Priority 3 (Backup)	8	
2. Essential (.999 Availability, 10 minute restoration)		
	7	
	6	
	5	
	4	
3. Routine (.99 Availability, 1.68 hour restoration)		
	3	
	2	
	1	
4. Network OT&E	0	Testing, temporary evaluation

References:

3.0 *Administration* B Network Overview

The ***Administration B*** Network is a ***system*** of leased and owned transmission facilities connecting network equipment resources (Routers, Hubs, Switches, etc.). The network (equipment and telecommunication lines) has a mean time between failure (MTBF) of .9999 or better. The operational management ***system*** is **XXXXX version x.x.** The network is centrally managed at **LOCATION A and Alternate Location B (if provided).**

3.1 Transmission Facilities

The network nodes are linked together with a minimum of two trunks creating a diverse network.

3.2 Clocking Scheme

Clocking for the ***Administration*** A Network is as follows:

- Number of Master Clock Sources.
- Describe how the clocking is distributed.

3.3 Operational *Domains*

In order to maintain operational integrity, ***domain*** separation is implemented between nodes in a particular area or between networks. Firewalls allow seamless communications among the ***domains***, but prevents non-certified, authenticated, or authorized operators from accessing the other ***domains*** within the ATN Network, and total isolation between the ATN and non-ATN networks.

The capability should exist to allow inter-nodal and inter-***domain*** operator and maintenance access. This capability is negotiated between **ATN *Administration*s** and other non-ATN administrators as required supporting mission requirements while maintaining operational integrity concerns.

3.4 Preemption and Priority Scheme

With the use of routing algorithms, the ATN shall always attempt to place a call over a primary path first. A primary path is defined as the shortest route, with the least nodal hops. In the event, the primary path is not available; the network will place the call over an alternate route. Call routing on the ATN will be automatic, requiring the establishment of a priority and preemption scheme. See Table 1a for the list of ATN priorities.

Table 1a.

ATN Network
Call Priority/Preemption Plan

Service Category	Priority/ Preemption	Types of ***Services***
Lowest priority = 0 Highest priority = n		
1. Critical (.99999 Availability, 6 second restoration)		
Priority 1 (Primary)	13	
Priority 1 (Backup)	12	
Priority 2 (Primary)	11	
Priority 2 (Backup)	10	
Priority 3 (Primary)	9	
Priority 3 (Backup)	8	
2. Essential (.999 Availability, 10 minute restoration)		
	7	
	6	
	5	
	4	
3. Routine (.99 Availability, 1.68 hour restoration)		
	3	
	2	
	1	
4. Network OT&E	0	Testing, temporary evaluation

References:

4.0 *ADMINISTRATION*S AND RESPONSIBILITIES

This section details the guidelines, structure, and duties of individuals and groups of the established ATN Network and ATN ***system*** owners or operators identified in this MOA. Contact person(s) for parties are identified.

4.1 *Administration* A network Operations Mission

Allocations of resources and responsibilities relating to ***services*** of the ATN Network are governed by the following guidelines:

- Simplify the Network operations while accommodating the general Air Traffic Control (ATC) operations and maintenance philosophy.

- Provide high responsiveness to end-users at all locations and central management to eliminate the need for 24-hour, local, on-site operation and maintenance dedication.
- Minimize the time for localization and correlation of failures in end-user equipment or individual transmission ***systems*** attached to the Network with the Network Management ***System*** (NMS) ability to aid in trouble localization.

4.1.1 *Administration* B network Operations Mission

Allocations of resources and responsibilities relating to ***services*** of the ATN Network are governed by the following guidelines:

- Simplify the Network operations while accommodating the general Air Traffic Control (ATC) operations and maintenance philosophy.
- Provide high responsiveness to end-users at all locations and central management to eliminate the need for 24-hour, local, on-site operation and maintenance dedication.
- Minimize the time for localization and correlation of failures in end-user equipment or individual transmission ***systems*** attached to the Network with the Network Management ***System*** (NMS) ability to aid in trouble localization.

4.2 Organizational Structure

This section describes the basic organizational construction of the ATN ***system*** owners or operators, and initial points of contact and offices of responsibility.

4.2.1 *Administration* A Structure

The structure of the ***Administration A's*** Network Management Group is designed to provide maximum response to the end user. The following Network Management ***administration***al structures are described in this section.

- ATN Engineering and Implementation Group
- ATN Configuration Management Group.
- ATN Network Operations Center(s)

4.2.1.1 ATN Engineering and Implementation Group

The ATN Engineering and Implementation Group structure consists of the following:

- International Telecommunications Office
- POC Phone # Office
- Program/Project Office
- POC Phone # Office
- Network Engineering Group
- POC Phone # Office

4.2.1.2 ATN Network Operations Center (NOC)

The ATN NOC structure consists of the following:

- Location A Network Center Manager
  - POC Phone # Office
- Location A Technical POC's
  - POC 1 Phone # Office
  - POC 2 Phone # Office

4.2.2 *Administration* B Structure

The structure of the ***Administration B's*** Network Management and ***Administration*** Groups is designed to provide maximum response to the end user. The following Network Management ***administration***al structures are described in this section.

- ATN Engineering and Implementation Group
- ATN Configuration Management Group
- ATN Network Operations Center(s)

4.2.2.1 ATN Engineering and Implementation Group

The ***Administration B*** Engineering and Implementation Group structure consists of the following:

- Engineering and Development Unit
  - POC 1, Phone #, Organizational Identifier
  - POC 2, Phone #, Organizational Identifier
  - POC n, Phone #, Organizational Identifier

4.2.2.2 ATN Operations POC

The ***Administration B*** Operations POC information is as follows:

- POC 1, Phone #, Organizational Identifier
- POC 2, Phone #, Organizational Identifier
- POC n, Phone #, Organizational Identifier

4.2.2.3 ATN Network Operations Center (NOC)

The ATN NOC structure consists of the following:

- Location B Network Center Manager
  - POC Phone # Office
- Location B Technical POC's
  - POC 1 Phone # Office
  - POC 2 Phone # Office

4.3 Organizational Responsibilities

This section describes the responsibilities of the ***administration***s and personnel involved in the networks. The ***Administration*** *A* NOC ensures that ***service***-related problems are resolved and works directly with the ***Administration*** *B* NOC as necessary.

4.3.1 Network Planning

Network planning is the responsibility of the network engineering group of each network and includes the following:

- Proposing recommendations regarding network configuration changes and increasing or decreasing infrastructure resources.
- Reviewing and recommending new and/or revised Management, Operational, and Maintenance procedures.
- Analyzing regional performance data.
- Providing recommendations for network improvements.

4.3.2 Network Analysis

Network analysis is the responsibility of the network engineering group of each ***administration*** and accomplishes the following:

- Evaluates data from the NOC and the NMS to identify network improvement areas.
- Analyzes reports on network events and usage, and distributes monthly reports via email to all ATN ***system*** owners or operators.
- Provides coordination for all network related activities
- Coordinates with other telecommunications ***service*** managers to ensure optimum performance.
- Examines the communications needs and the expandability of current configurations for integration into the network.
- Determines which circuits and ***services*** to implement on the network.

4.3.3 Network Operations Centers (NOC)

The NOC functionality as described in Section 4.3.2 provides the basic requirements of what is essentially required to operate and maintain a functional and efficient network operation. This basic functionality can be provided by participating states, Civil Aviation Authorities, or contract ***service Organization***s. It is essential that the functionality described herein be provided.

The Network Operations Center is required in order to ensure there is a central focus for network operations. The NOC is made up of network experts at one or more locations and is responsible for internal network operations and ***boundary device system*** elements. The NOC gathers information for future analysis and monitors network performance, security, and integrity.

The NOC is equipped with a Network Management ***System*** (NMS), which provides the network operators the capabilities to monitor performance and availability of the network, and the ability to control and test network elements and circuits as required.

Configuration of user circuits required for transmission to or from the network is coordinated according to procedures stated in this agreement. The NMS provides a real-time view of the network down to the card and port levels of the equipment. The NMS provides fault notification, isolation, and restoration capabilities to the Network Operators

The NOC operates 24 hours a day, 7 days a week with the following responsibilities:

- Provide a single point of contact for the Network
- Provide first-level ***service*** support.
- Perform operations and direct maintenance activities.
- Continuously monitor activities and utilization.
- Monitor and localize network problems.
- Maintain a Trouble Report ***System***.
- Ensure trouble resolution.
- Perform escalation.
- Report trouble status.
- Coordinate with points of contact.
- Coordinate maintenance activities.
- Coordinate ***service*** establishment.
- Implement configurations.
- Maintain logs.
- Manually route traffic, as required, to maintain network operations.
- Provide information for the development of monthly network traffic statistic reports.
- Provide configuration management.

The above bullets are expanded below in Paragraphs 4.3.2.1 through 4.3.2.17

4.3.3.1 Provide a Single Point of Contact for the ATN Network

The NOC is the central point of contact for all network-related issues. The NOC is the single point of contact for issues relating to the ATN Network. Telephone numbers, FAX numbers, and Email addresses for the NOC are provided in Table 1b.

Table 1b.

	TELEPHONE No.	**FAX No.**	**Email Address**
POC 1			
POC 2			
POC 3			
POC n			

4.3.3.2 Provide First-Level *Service* Suppo*rt*

The ATN NOC is the first level of ***service*** support for all ATN Network-related issues. This ***service*** support includes all Network-related equipment problems.

4.3.3.3 Perform Operations and Direct Maintenance Activities

The ATN NOC shall perform operations and coordinates the maintenance activities for the Network and all associated equipment with users that will be affected. The performance of operations and the direction of the maintenance activities will ensure that the ATN Network is as efficient as possible.

4.3.3.4 Continuously Monitor Activities and Utilization

The ATN NOC shall continuously monitor the utilization of the ATN Network and its related equipment. The NOC shall ensure that all ATN Network ***services*** are performing properly and all trunks are operating within specifications. The NOC also monitors all logged-on user activities.

4.3.3.5 Monitor and Localize Network Problems

The ATN NOC shall monitor the network for any trouble. Adjacent networks will assist in troubleshooting performance issues. Trouble(s) shall be localized and maintenance shall be coordinated where appropriate. Direction of maintenance will include calling the points of contact and the ***service*** providers.

4.3.3.6` Maintain the Trouble Report *System*

The ATN NOC shall maintain the trouble report ***system*** by recording network impairments reported by users or identified through the NMS. The NOC will ensure that trouble tickets are initiated properly, that the information is continuously updated, and the trouble tickets are properly closed. Once the trouble tickets have been closed, the NOC will notify all concerned parties of their resolution. Trouble reports shall be shared as required.

4.3.3.7 Ensure Trouble Resolution

The ATN NOC shall ensure that all identified troubles are resolved.

4.3.3.8 Perform Escalation

The ATN NOC shall perform all escalation procedures necessary for the resolution of network troubles

4.3.3.9 Report Trouble Status

The ATN NOC shall provide status reports of troubles reported to them relating to other points of contact in accordance with agreed schedules. For priority 1 troubles, the NOC, as well as all affected users, will be notified automatically when the trouble is detected, and again when the trouble is repaired and ***service*** restored.

4.3.3.10 Coordinate with Points of Contact

The ATN NOC shall coordinate with the proper points of contact for trouble resolution. The user points of contact shall contact the ATN NOC (as appropriate) as soon as network troubles are experienced.

4.3.3.11 Coordinate Maintenance Activities

The ATN NOC shall coordinate all ATN Network-related maintenance activities. These activities include preventive, routine, and emergency maintenance. The NOC shall initiate all requests for maintenance time periods, will ensure that all affected network sites are aware of the requests, and will ensure maintenance is completed.

4.3.3.12 Coordinate *Service* Establishment

The ATN NOC, in cooperation with the AFL POC, shall coordinate the establishment of all related inter-network ***services***. The ATN NOC will ensure that the ***service*** is operational and will update all their databases.

4.3.3.13 Implement Configurations

The NOC shall implement configurations as required. Coordination with users potentially impacted shall be done prior to any changes.

4.3.3.14 Maintain the Log

The ATN NOC shall maintain a log of all Network-related queries, by telephone, E-mail, or any other contact, unless a trouble ticket is generated. This information will be made available to those that require it once a request has been received.

4.3.3.15 Manually Route Traffic

The NOC shall manually route traffic, as required, to better utilize or to place traffic on a preferred path. This will be done only on a case-by-case basis, and in concert with affected users whenever possible.

4.3.3.16 Provide Monthly Network Traffic Statistic Reports

The ATN NOC shall provide monthly reports of ATN's BWM Network traffic statistics to users that need the information and have submitted a request. These reports are to be used to ensure that there is adequate bandwidth in the network.

4.3.3.17 Provide Configuration Management

To preserve the integrity of the ATN BWM Network, changes to hardware, software, or operational procedures shall first be presented in proposal form to the Engineering group at least 30 days in advance of the proposed implementation date. This will ensure that their impact on the network can be ascertained. Differences regarding the implementation of the proposed changes will be subject to negotiation between the ATN ***system*** owners or operators.

4.4 Specific Responsibilities for *Administration* A and *Administration* B POC's

4.4.1 ATN NOC

The ATN NOC is responsible for all activities relating to the network elements in their ***domain*** and all circuits that are connected to that network. They are also responsible for coordinating with other networks and users for problem resolution.

5.0 MAINTENANCE OBJECTIVES

A maintenance plan is critical to the successful operation of the ATN Network. This section describes the objectives, procedures, and priorities for maintaining the ATN Network. The maintenance objectives of the ATN Network are to accomplish the following:

- Provide a single point of contact for maintenance
- Control trouble localization from one point
- Provide procedures for maintenance activities
- Set priorities for accomplishing maintenance

The NOC is equipped with a Network Management ***System*** (NMS) that provides monitoring and control points for the network. The NMS provides a complete, real-time view of the network down to the trunk and ports. The NMS provides fault notification, isolation, and restoration capabilities to the BWM Network Operator. The NMS allows alarms to be prioritized to network severity and provides thresholds to meet the operational needs of the network.

The NOC has the primary responsibility for initiating, coordinating, and escalating the maintenance activities. It is the single point of contact for provisioning maintenance ***services***. The NOC is available 24 hours a day, 7 days a week.

5.1 Trouble Reporting

The network monitoring functions will alarm for events that happen on the ATN Network. However, any user of the Network, at the first sign of abnormal or unsatisfactory operations, should contact their responsible NOC.

5.2 Logging Calls

All informational and trouble calls related to the ATN Network shall be entered into the daily logs maintained at the NOC. All calls relating to unsatisfactory operation of the Network shall be entered into the daily log and, monthly reports will be prepared for exchange between ATN ***system*** owners or operators. The method of exchange shall be via e-mail, fax, or telephone, as appropriate.

The NOC has an automated trouble ticket ***system*** that provides a speedy and organized response to ***service*** disruption on the network.

5.3 Maintenance Priorities

5.3.1 ATN Maintenance Priorities

ATN ***system*** owners or operators as shown below will perform maintenance on a priority basis. Table 5-1 provides the action to be taken for each priority level.

Priority 1:

- Loss of critical ***service*** (critical user or trunk ***service***)
- Loss of 50 percent or more of the ***service*** at one location
- Failure of the NMS to function correctly.

Priority 2:

- Loss of essential ***service***
- Inability to clear alarms after troubles cease.

Priority 3:

- Troubles identified by trend analysis not covered in Priorities 1 or 2
- Single-incident quality trouble

Priority 4

- Request for monitoring
- Request for research

5.3.1.1 Repair Status

Reporting time for status of trouble calls shall be based on priority shown in Table 5-1. All clearances on the trouble calls associated with Table 5-1 shall be within 4 hours from escalation. Trouble reports on all non-cleared ***service***-affecting faults should be exchanged among network managers on an hourly (at a minimum) basis until the fault is cleared. Trouble reports on all other non-***service***-affecting faults should be exchanged among network managers at four (4) hour intervals.

Table 5-1 Reporting Time for Trouble Calls

Priority[1]	**Action**
1	Within 30 minutes Every 30 minutes thereafter
2	Within 1 hour Every 1 hour thereafter
3	Within 4 hours Daily status update will be given
4	Within 24 hours Daily status update will be give

NOTE 1: The Priority definitions are identified in paragraph 5.3.1.

5.3.1.2 Escalation

The NOC shall perform escalations as necessary in concert with other networks and users affected. Faults detected and isolated will be escalated after the elapsed time exceeds twice the initial response time in according to the levels shown in Table 5-1. Points of Contact for the escalation process are listed in Appendix 2. Further, all faults detected will be relayed to the respective network managers as follows:

- All ***system*** faults within 1 hour from detection
- All major trunk faults within 30 minutes from detection

Standard escalation procedures will require trouble tickets to be escalated according to the following levels:

Table 5-2. Standard Escalation Levels

Level	Standard Escalation Levels
First	NOC
Second	NOC Supervisor
Third	TBD
Fourth	TBD
Fifth	TBD

5.3.1.3 Back-up Procedures in the Event of a Total Node Failure

Back-up procedures shall be in accordance with those outlined in the contingency plans for the facility.

5.3.1.4 Node-to-Node Trunk Failures

In case of node-to-node trunk failure, all network traffic shall be automatically re-routed and restored by the Network to the non-failed trunk within four (4) to six (6) seconds of failure detection. Bandwidth contention shall be resolved via a preempt/priority scheme to assure delivery of the highest priority messages.

If there is insufficient bandwidth available to re-route the traffic without interrupting other ***service***, bandwidth shall be made available automatically based on the priority ***services*** in accordance with the pre-empt priority scheme, to be considered at a later date, until the trunk becomes available again.

5.4 Configuration Changes

Whenever a configuration change is made to a primary ATN/AMHS element, the configuration of any standby element must also be updated.
Configuration that may effect other ATN ***system*** owners or operators must be communicated and shared between ATN ***system*** owners or operators.

6.0 TECHNICAL ASSETS

To assist with the operation and maintenance of the ATN Network, the following tools should be available:

- Network Management ***System*** (NMS)
- Trouble Management ***System*** (TMS) with Trouble Ticket Tools
- Standard Network Test Equipment that is already in the inventory
- Reports

6.1 Network Management *System* (NMS)

The NOC uses a Network Management ***System*** (NMS) to monitor the health and status of the elements and devices installed in the network. The NMS provides a graphical user interface that incorporates all elements of the Network into a user-friendly platform that provides clear access to the operational status of the network.

The workstation gives the NMS operators a graphical display of each Network. The NMS will constantly monitor the operational status of the network and provide real time display updates. Operational updates include changes to ***system*** alarms and failures as well as changes in configuration.

In case of a performance degradation, or loss of a trunk or an entire site, the Network will automatically switch to a different trunk to go around the effected element, independent of the NMS. The loss of an NMS will not affect the operation of the Network; the Network will operate independently of the NMS.

6.2 Trouble Management *System*

The Trouble Management ***System*** (TMS), which includes a Trouble Ticket Tool, is an automated trouble ticket handling ***system*** with a centralized database. The NOC uses the TMS for efficient and timely trouble handling. The NOC records certain information obtained from the user into the TMS. This information includes:

- The name and callback number of the individual reporting the trouble
- Contact name and number at the trouble site location
- Network circuit or channel number
- Failed device or element
- Time of initial degradation or ***service*** disruption
- Description of ***service*** impairment and current status
- Release for circuit testing

All entries made in a TMS trouble ticket are required to be computer stamped with the date, time, and initials of the operator making the update. TMS shall play a major role in trouble handling by providing a means to:

- Record Network impairments reported by users or identified through the NMS.
- Assign the proper priority and trouble codes for timely resolution of the impairment.
- Refer the reported impairment to the appropriate Network operations location for resolution.

- Provide regional central points where corrective actions can be progressively followed and resolution status is maintained.
- Provide a computerized database of trouble histories for trend analysis.

6.3 Network Testing

Because of the disruptive nature of network testing, the Network operators and users shall employ stringent coordination procedures prior to initiating network tests.

6.3.1 Standard Test Equipment

No unique test equipment will be required to maintain the ATN Network.

7.0 AGREEMENT

This agreement constitutes the entire Agreement between the parties and supersedes all previous statements or representations, whether oral or written, with respect to the subject matter of the Agreement. Any change or modification must be in writing and signed by duly authorized representatives or both parties hereto.

6.1 *Authority*

WITNESS that the parties have read this Agreement, including the attached schedules, and agree to be bound by its terms and have therefore caused this agreement to be executed by their duly authorized representative as set forth below.

***Administration* A**	***Administration* B**
By: _____	By: _____
Printed Name: _____	Printed Name: _____
Title: _____	Title: _____
Date: _____	Date: _____
Witness: _____	Witness: _____
Printed Name: _____	Printed Name: _____
Date: _____	Date: _____
_____	_____
Company Stamp	Company Stamp

APPENDIX 1: Points of Contact

Location	POC	Telephone No.	FAX No.	Email Address

APPENDIX 2: Escalation Level POCs

***Administration* A Escalation Level POCs**

	Location	POC	Telephone No.	FAX No.	Email Address
1					
2					
3					

***Administration* B Escalation Level POCs**

	Location	POC	Telephone No.	FAX No.	Email Address
1					
2					
3					

TABLE CNS-1D

ATS INTER-FACILITY DATA COMMUNICATION (AIDC)

IMPLEMENTATION PLAN

Explanation of the Table

Column

1 Administration – the name of the Administration, State or Organization responsible for management of the AIDC;

2 Location of AIDC end system – the location of the AIDC end system under the supervision of Administration identified in column 1;

3 AIDC Pair – the correspondent AIDC end system;

Location – location of the correspondent AIDC end system

Administration – the name of the administration, State or Organization responsible for management of the correspondent AIDC end system

4 AIDC standard used – the AIDC standard adopted for the AIDC connection between the corresponding AIDC pair, AFTN/AMHS or ATN;

5 Target Date of Implementation – date of implementation of the AIDC end system;

6 Remarks – any additional information describing the AIDC end system or the AIDC service between the corresponding AIDC pair.

TABLE CNS-1D **Appendix E to the Report**

ATS INTERFACILITY DATA COMMUNICATION (AIDC) ROUTING PLAN

Administration	Location of AIDC end system	AIDC Pair		AIDC standard used	Target date of Implementation	Remarks
		Correspondent location	Correspondent Administration			
1	2	3		4	5	6
Australia						
Bangladesh						
Bhutan						
Brunei Darussalam						
Cambodia						
China						
Hong Kong, China						
Macao, China						
Cook Islands						
Democratic People's Republic of Korea						
Fiji						
India						
Indonesia	Jakarta		Australia			
			Singapore			
	Makassar		Australia			
Japan						
Kiribati						
Lao People's Democratic Republic						
Malaysia						
Maldives						
Marshall Islands						

TABLE CNS-1D
ATS INTERFACILITY DATA COMMUNICATION (AIDC) ROUTING PLAN

Administration	Location of AIDC end system	AIDC Pair		AIDC standard used	Target date of Implementation	Remarks
		Correspondent location	Correspondent Administration			
1	2	3		4	5	6
Micronesia (Federated States of)						
Mongolia						
Myanmar						
Nauru						
Nepal						
New Zealand						
Palau						
Papua New Guinea						
Philippines						
Republic of Korea						
Samoa						
Singapore						
Solomon Islands						
Sri Lanka						
Thailand	Bangkok	Phnom Penh	Cambodia	ATN	2005	
		Vientiane	Laos	ATN	2005	
		Kuala Lumpur	Malaysia	ATN	2005	
		Yangon	Myanmar	ATN	2005	
		Hochiminh	Viet Nam	ATN	2005	
Tonga						
Vanuatu						
Viet Nam						

TABLE CNS-1C

ATS MESSAGE HANDLING SERVICE (ATSMHS)

IMPLEMENTATION PLAN

Explanation of the Table

Column

1	Administration – the name of the Administration, State or Organization responsible for management of the facility
2	Location of Facility
3	Facility Type: AMHS UA (Location of AMHS)
4	Target Date of Implementation – date of implementation of the ATSMHS
5	Remarks

AMHS – ATS Message Handling System which may include Message Transfer Agents and AFTN/AMHS gateways services.

TABLE CNS-1C ATS MESSAGE HANDLING SERVICE (ATSMHS) IMPLEMENTATION PLAN

Administration	Location of Facility	Facility Type	Target Date of Implementation	Remarks
American Samoa	Pago Pago	UA (Salt Lake City)	2005	
Australia	Brisbane	AMHS	2006	
Bangladesh	Dhaka	AMHS	2005	
Bhutan	Paro	UA (Mumbai)	2008	
Brunei Darussalam	Brunei	AMHS	2006	
Cambodia	Phnom Penh	AMHS	2005	
China	Beijing	AMHS	2005	
	Taibei	AMHS	2005	
Hong Kong, China	Hong Kong	AMHS	2005	
Macau, China	Macau	AMHS	2005	
Cook Island	Rarotonga	UA (Christchurch)	2006	
Timor Leste	Dili	UA (Brisbane)	2006	Under construction
DPR Korea	Pyongyang	AMHS	2005	
Fiji	Nadi	AMHS	2005	
French Polynesia	Papeete	UA (Christchurch)	2006	
India	Mumbai	AMHS	2005	
Indonesia	Jakarta	AMHS	2006	
	Ujung Pandang	AMHS	2006	
Japan	Tokyo	AMHS	2004	
Kiribati	Tarawa	UA (Nadi)	2005	

TABLE CNS-1C ATS MESSAGE HANDLING SERVICE (ATSMHS) IMPLEMENTATION PLAN

Administration	Location of Facility	Facility Type	Target Date of Implementation	Remarks
Lao PDR	Vientiane	AMHS	2005	
Malaysia	Kuala Lumpur	AMHS	2005	
Maldives	Male	AMHS	2005	
Marshall Island	Majuro	UA (Salt Lake City)	2005	
Micronesia Federated State of	Chuuk	UA (Salt Lake City)	2005	
	Kosrai	UA (Salt Lake City)	2005	
	Ponapei	UA (Salt Lake City)	2005	
	Yap	UA (Salt Lake City)	2005	
Mongolia	Ulaanbaatar	AMHS	2006	
Myanmar	Yangon	AMHS	2005	
Nauru	Nauru	UA (Brisbane)	2006	
Nepal	Kathmandu	AMHS	2005	
New Caledonia	Noumea	UA (Nadi)	2005	
New Zealand	Christchurch	AMHS	2006	
Niue Is	Niue	UA (Christchurch)	2006	
Pakistan	Karachi	AMHS	2006	
Palau	Koror	UA (Salt Lake City)	2005	
Papua New Guinea	Port Moresby	UA (Brisbane)	2006	
Philippines	Manila	AMHS	2005	
Republic of Korea	Seoul	AMHS	2005	
Samoa	Faleolo	UA (Christchurch)	2006	

TABLE CNS-1C ATS MESSAGE HANDLING SERVICE (ATSMHS) IMPLEMENTATION PLAN

Administration	Location of Facility	Facility Type	Target Date of Implementation	Remarks
Singapore	Singapore	AMHS	2005	
Solomon Is	Honiara	UA (Brisbane)	2006	
Sri Lanka	Colombo	AMHS	2005	
Thailand	Bangkok	AMHS	2005	
Timor Leste	Dili	UA (Brisbane)	2006	
Tonga	Tongatapu	UA (Christchurch)	2006	
Tuvalu	Funafuti	UA (Nadi)	2005	
United States	Salt Lake City	AMHS	2004	
Vanuatu	Port Vila	UA (Brisbane)	2006	
Viet Nam	Hanoi	AMHS	2005	
Wallis Is.	Wallis	UA (Nadi)	2005	

TABLE CNS 1B – ATN ROUTER PLAN

Explanation of the Table

Column

1	Administration – the name of the Administration, State or Organization responsible for management of the router
2	Location of Router
3	Type of Router: BBIS - Backbone Boundary Intermediate System BIS - Boundary Intermediate System
4	Type of Interconnection: Inter – Regional Intra – Regional Sub – Regional
5	Interconnection, Connected to router of: name of the location of the correspondent router
6	Link Speed – Speed requirements of the interconnecting link
7	Link Protocol – Protocol requirements for the interconnecting link
8	Target Date of Implementation – date of implementation of the router
9	Remarks

TABLE CNS-1B – ATN ROUTER PLAN

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
American Samoa	Pago Pago			United States	9600bps	X.25		Intra-domain
Australia	Brisbane			Timor Leste	9600 bps	X.25		Intra-domain
		BBIS	Sub-Regional	Fiji	19200 bps	X.25	2006	
		BIS	Sub-Regional	Indonesia	9600bps	X.25	2006	
		BBIS	Intra-Regional	Japan	64000bps	X.25	2007	
				Nauru	9600bps	X.25		Intra-domain
		BIS	Sub-Regional	New Zealand	9600bps	X.25	2006	
				Papua New Guinea	9600bps	X.25		Intra-domain
		BBIS	Intra-Regional	Singapore	64000bps	X.25	2006	
				Solomon Islands	9600bps	X.25		Intra-domain
		BBIS	Inter-Regional	United States	64000bps	X.25	2006	
				Vanuatu	9600bps	X.25		Intra-domain
Bangladesh	Dhaka	BIS	Sub-Regional	India	9600bps	X.25	2005	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
Bhutan	Paro	BIS	Sub-Regional	India	9600bps	X.25	2008	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Brunei Darussalam	Brunei	BIS	Sub-Regional	Malaysia	9600bps	X.25	2006	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2006	
Cambodia	Phnom Penh	BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
China	Beijing	BIS	Sub-Regional	DPR Korea	9600bps	X.25	2005	
		BBIS	Intra-Regional	Hong Kong, China	64000bps	X.25	2005	
		BBIS	Intra-Regional	India	64000bps	X.25	2005	
		BBIS	Intra-Regional	Japan	64000bps	X.25	2005	
		BBIS	Inter-Regional	Kuwait	64000bps	X.25	2006	
		BIS	Sub-Regional	Macau, China	9600bps	X.25	2005	
		BIS	Sub-Regional	Mongolia	9600bps	X.25	2005	
		BIS	Sub-Regional	Myanmar	9600bps	X.25	2005	
		BIS	Sub-Regional	Nepal	9600bps	X.25	2005	
		BIS	Sub-Regional	Pakistan	9600bps	X.25	2006	
		BIS	Sub-Regional	Republic of Korea	9600bps	X.25	2005	
		BBIS	Inter-Regional	Russian Federation	19200bps	X.25	2005	
		BIS	Sub-Regional	Taibei	9600bps	X.25	2005	
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2005	
	Taibei	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2005	
		BIS	Sub-Regional	Japan	9600bps	X.25	2007	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Hong Kong, China	Hong Kong	BBIS	Intra-Regional	China	64000bps	X.25	2005	
		BIS	Sub-Regional	Macau, China	9600bps	X.25	2005	
		BBIS	Intra-Regional	Japan	64000bps	X.25	2005	
		BIS	Sub-Regional	Philippines	9600bps	X.25	2005	
		BIS	Sub-Regional	Taibei	9600bps	X.25	2005	
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2004	
		BIS	Sub-Regional	Viet Nam	9600bps	X.25	2005	
Macau, China	Macau	BIS	Sub-Regional	China	9600bps	X.25	2005	
		BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2005	
Cook Islands	Rarotonga			New Zealand	9600bps	X.25		Intra-domain
DPR Korea	Pyongyang	BIS	Sub-Regional	China	9600bps	X.25	2005	
Fiji	Nadi	BBIS	Intra-Regional	Australia	19200 bps	X.25	2006	
		BIS	Sub-Regional	Kiribati	9600bps	X.25	2006	
		BIS	Sub-Regional	New Caledonia	9600bps	X.25	2006	
		BIS	Sub-Regional	Tuvalu	9600bps	X.25	2006	
		BBIS	Inter-Regional	United States	19200 bps	X.25	2005	
		BIS	Sub-Regional	Wallis Islands	9600bps	X.25	2006	
		BIS	Sub-Regional	New Zealand	9600 bps	X.25	2006	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
French Polynesia	Papeete			New Zealand	9600bps	X.25		Intra-domain
India	Mumbai	BIS	Sub-Regional	Bangladesh	9600bps	X.25	2005	
		BIS	Sub-Regional	Bhutan	9600bps	X.25	2008	
		BBIS	Intra-Regional	China	64000bps	X.25	2005	
		BBIS	Inter-Regional	Kenya	19200bps	X.25	2005	
		BIS	Sub-Regional	Nepal	9600bps	X.25	2005	
		BBIS	Inter-Regional	Oman	19200bps	X.25	2005	
		BIS	Sub-Regional	Pakistan	9600bps	X.25	2006	
		BBIS	Intra-Regional	Singapore	64000bps	X.25	2005	
		BIS	Sub-Regional	Sri Lanka	9600bps	X.25	2005	
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2005	
Indonesia	Jakarta	BIS	Sub-Regional	Australia	9600bps	X.25	2006	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2005	
Japan	Tokyo	BBIS	Intra-Regional	Australia	64000bps	X.25	2006	
		BBIS	Intra-Regional	China	64000bps	X.25	2005	
		BBIS	Intra-Regional	Hong Kong, China	64000bps	X.25	2005	
		BBIS	Inter-Regional	Europe	64000bps	X.25	2005	
		BIS	Sub-Regional	Republic of Korea	9600bps	X.25	2005	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Japan (Cont'd)	Tokyo	BBIS	Inter-Regional	Russia Federation	64000bps	X.25	2005	
		BBIS	Intra-Regional	Singapore	64000bps	X.25	2005	
		BIS	Sub-Regional	Taibei	9600bps	X.25	2007	
		BBIS	Inter-Regional	United States	64000bps	X.25	2004	
Kiribati	Tarawa	BIS	Sub-Regional	Fiji	9600bps	X.25	2005	
Lao PDR	Vientiane	BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
		BIS	Sub-Regional	Viet Nam	9600bps	X.25	2005	
Malaysia	Kuala Lumpur	BIS	Sub-Regional	Brunei	9600bps	X.25	2006	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2005	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
Maldives	Male	BIS	Sub-Regional	Sri Lanka	9600bps	X.25	2005	
Marshall Islands	Majuro			United States	9600bps	X.25		Intra-domain
Micronesia Federated State of	Chuuk			United States	9600bps	X.25		Intra-domain
	Kosrae			United States	9600bps	X.25		Intra-domain
	Ponapei			United States	9600bps	X.25		Intra-domain
	Yap			United States	9600bps	X.25		Intra-domain
Mongolia	Ulaanbaatar	BIS	Sub-Regional	China	9600bps	X.25	2005	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Myanmar	Yangon	BIS	Sub-Regional	China	9600bps	X.25	2005	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
Nauru	Nauru			Australia	9600bps	X.25		Intra-domain
Nepal	Kathmandu	BIS	Sub-Regional	China	9600bps	X.25	2005	
		BIS	Sub-Regional	India	9600bps	X.25	2005	
New Caledonia	Noumea	BIS	Sub-Regional	Fiji	9600bps	X.25	2005	
New Zealand	Christchurch	BIS	Sub-Regional	Australia	9600bps	X.25	2006	
				Cook Is	9600bps	X.25		Intra-domain
		BIS	Sub-Regional	Fiji	9600bps	X.25	2006	
				French Polynesia	9600bps	X.25		Intra-domain
				Niue	9600bps	X.25		Intra-domain
				Samoa	9600bps	X.25		Intra-domain
				Tonga	9600bps	X.25		Intra-domain
Niue Islands	Niue			New Zealand	9600bps	X.25		Intra-domain
Pakistan	Karachi	BIS	Sub-Regional	China	9600bps	X.25	2006	
		BIS	Sub-Regional	India	9600bps	X.25	2006	
Palau	Koror			United States	9600bps	X.25		Intra-domain
Papua New Guinea	Port Moresby			Australia	9600bps	X.25		Intra-domain

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Philippines	Manila	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2005	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2005	
Republic of Korea	Seoul	BIS	Sub-Regional	China	9600bps	X.25	2005	
		BIS	Sub-Regional	Japan	9600bps	X.25	2005	
Samoa	Faleolo			New Zealand	9600 bps	X.25		Intra-domain
Singapore	Singapore	BBIS	Intra-Regional	Australia	64000bps	X.25	2006	
		BBIS	Inter-Regional	Bahrain	64000 bps	X.25	2005	
		BIS	Sub-Regional	Brunei	9600bps	X.25	2006	
		BBIS	Intra-Regional	India	64000bps	X.25	2005	
		BIS	Sub-Regional	Indonesia	9600bps	X.25	2005	
		BBIS	Intra-Regional	Japan	64000bps	X.25	2005	
		BIS	Sub-Regional	Malaysia	9600bps	X.25	2005	
		BIS	Sub-Regional	Philippines	9600bps	X.25	2005	
		BIS	Sub-Regional	Sri Lanka	9600bps	X.25	2005	
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2005	
		BBIS	Inter-Regional	United Kingdom	64000 bps	X.25	2005	
		BIS	Sub-Regional	Viet Nam	9600bps	X.25	2005	
Solomon Islands	Honiara			Australia	9600bps	X.25		Intra-Domain

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Sri Lanka	Colombo	BIS	Sub-Regional	India	64000 bps	X.25	2005	
		BIS	Sub-Regional	Maldives	9600bps	X.25	2005	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2005	
Thailand	Bangkok	BIS	Sub-Regional	Bangladesh	9600bps	X.25	2005	
		BIS	Sub-Regional	Cambodia	9600bps	X.25	2005	
		BBIS	Intra-Regional	China	64000bps	X.25	2005	
		BBIS	Intra-Regional	Hong Kong, China	64000bps	X.25	2004	
		BBIS	Intra-Regional	India	64000bps	X.25	2005	
		BBIS	Inter-Regional	Italy	19200bps	X.25	2005	
		BIS	Sub-Regional	Lao PDR	9600bps	X.25	2005	
		BIS	Sub-Regional	Malaysia	9600bps	X.25	2005	
		BIS	Sub-Regional	Myanmar	9600bps	X.25	2005	
		BBIS	Intra-Regional	Singapore	64000bps	X.25	2005	
		BIS	Sub-Regional	Viet Nam	9600bps	X.25	2005	
Timor Leste	Dili			Australia	9600bps	X.25		Intra-domain
Tonga	Tongatapu			New Zealand	9600bps	X.25		Intra-domain
Tuvalu	Funafuti	BIS	Sub-Regional	Fiji	9600bps	X.25	2005	
United States	Salt Lake City			American Samoa	9600bps	X.25		Intra-domain

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
United States (Cont'd)	Salt Lake City	BBIS	Inter-Regional	Australia	64000 bps	X.25	2005	
		BBIS	Inter-Regional	Fiji	19200 bps	X.25	2005	
		BBIS	Inter-Regional	Japan	64000bps	X.25	2004	
				Marshall Islands	9600bps	X.25		Intra-domain
				Micronesia, Federated State of	9600bps	X.25		Intra-domain
				Palau	9600bps	X.25		Intra-domain
Vanuatu	Port Vila			Australia	9600bps	X.25		Intra-domain
Viet Nam	Hanoi	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2005	
		BIS	Sub-Regional	Lao PDR	9600bps	X.25	2005	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2005	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2005	
Wallis Islands	Wallis	BIS	Sub-Regional	Fiji	9600bps	X.25	2005	

TABLE CNS-1A - AFTN PLAN

Explanation of the Table

Column

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

2 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).

3 and 7 Type of circuit provided:

HF RTT	High frequency radio teletype
LTT	landline teletypewriter
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 hubs in the circuit: Also use/a for analogue or/d for digital appropriate to the tail circuit.

4 and 8 Circuit signalling speed, current or planned.

5 and 9 Circuit protocols, current or planned.

COP-B	Character oriented data link control procedure – System Category - B
X. 25	X.25 protocol

6 and 10 Data transfer code (syntax), current or planned.

ITA-2	International Telegraph Alphabet No. 2 (Baudot code)
IA-5	International Alphabet No. 5 (7 - unit code)

11 Target date of implementation

12 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.

Table CNS-1A AFTN PLAN

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	LDD/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/AGGC	S					LTT	75 baud	None	IA-5		Internet as interim measure
Jakarta/WIII	S	SAT/d	9600 bps	X.25	IA-5						Note 1,2
Nadi/NFFN	M	LDD/d	2400 bps	X.25	IA-5						Note 2
Nauru/ANAU	S					SAT/d	2400 bps	X.25	IA-5		Internet as interim measure
Port Moresby/AYPM	S	SAT/d	9600 bps	X.25	IA-5						Note 2
Port Vila/NVVV	S	LTT	300 baud	None	ITA-2						Internet as interim measure
Santiago/SCSC	M					LDD/d	2400 bps	X.25	IA-5	12/05	Current routing via USA
Singapore/WSSS	M	LDD/d	2400 bps	X.25	IA-5						
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						
Johannesburg	M	SAT/d	64 Kbps	X.25	IA-5						
BANGLADESH											
DHAKA - S/VGZR											
Bangkok/VTBB	S	SAT/d	300 baud	None	IA-5						
Kolkata/VECC	S	LDD/d	64 Kbps	X.25	IA-5						
BHUTAN											
PARO - S/VQPR											
Mumbai/VABB	S	SAT/a	300 baud	None	ITA-2						Dial up
BRUNEI DARUSSALAM											
BRUNEI - S/WBSB											
Singapore/WSSS	S	LDD/d	2400 bps	X.25	IA-5						
Kuala Lumpur/WMKK	S	LTT	2400 bps	None	IAT-2	LDD/d	9600 bps	X.25	IA-5	12/05	Note 1,2
CAMBODIA											
PHNOM PENH - S/VDPP											
Bangkok/VTBB	S	SAT/d	300 baud	None	IA-5						Note 2
CHINA											
BEIJING - M/ZBBB											
Guangzhou/ZGGG	S	LDD/d	9600 bps	X.25	IA-5						
Karachi/OPKC	M	LTT	50 baud	None	ITA-2	LDD/a		None	IA-5	12/04	
Kathmandu/VNKT	S	SAT/d	300 baud	None	IA-5						
Russian Fedration/UHHH	M	SAT/d	2400 bps	None	IA-5						(Khabarovsk)
Pyongyang/ZKKK	S	SAT/d	300 baud	None	IA-5						
Seoul/RKSS	S	SAT/d	9600 bps	X.25	IA-5						

Table CNS-1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
Ulaan Baatar/ZMUB	S	SAT/d	300 baud	None	IA-5						Note 2
Yangon/VYY\	S	SAT/d	300 baud	None	IA-5						
GUANGZHOU-M/ZGGG											
Beijing/ZBBB	M	LDD/d	9600 bps	X.25	IA-5						
Hanoi/VVNB	S	SAT/d	2400 bps	None	IA-5						
Hong Kong/VHHH	M	LDD/d	2400 bps	None	IA-5						Note 1
Macau/VMMC	S	LDD/d	2400 bps	None	IA-5						
Sanya/ZJSY	S	LDD/d	2400 bps	None	IA-5						
SANYA-S/ZJSY											
Guangzhou/ZGGG	S	LDD/d	2400 bps	None	IA-5						
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5						
TAIBEI - S/RCTP											
Hong Kong/VHHH	S	LDD/d	4800 bps	X.25	IA-5						
Manila/RPLL	S	LDD/d	300 bps	None	ITA-2						Note 1, 2
Naha/ROAH	S	LDD/d	4800 bps	X.25	IA-5						
HONG KONG, CHINA											
HONG KONG-M/VHHH											
Bangkok/VTBB	M	LDD/d	64 Kbps	X.25	IA-5						ATN link carrying AFTN Traffic
Guangzhou/ZGGG	S	LDD/d	2400 bps	None	IA-5						Note 1
Ho-Chi-Minh/VVTS	S	SAT/d	2400 bps	None	IA-5						
Macau/VMMC	S	LDD/d	2400 bps	None	IA-5						
Manila/RPLL	S	LDD/d	300 baud	None	ITA-2						
Sanya/ZJSY	S	LDD/d	2400 bps	None	IA-5						Note 1
Taibei/RCTP	S	LDD/d	4800 bps	X.25	IA-5						
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
MACAU, CHINA											
MACAU - S/VMMC											
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5						
Guangzhou/ZGGG	S	LDD/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						

Table CNS-1A AFTN PLAN

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
FIJI											
NADI - M/NFFN											
Brisbane/YBBB	M	LDD/d	2400 bps	X.25	IA-5						Note 2
Christchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5						Note 2
Funafuti/NGFU	S					LDD/d	2400 bps	None	IA-5	12/05	Dial-up
Noumea/NWWW	S	LDD/d	2400 bps	X.25	IA-5						Note 2
Tarawa/NGTT	S	LDD/d	2400 bps	None	IA-5						
United States/KSLC	M	SAT/d	2400 bps	X.25	IA-5						Note 2
Wallis Is./NLWW	S					LDD/a	2400 bps	None	IA-5	when traffic justifies	Current routing via Noumea
FRENCH POLYNESIA (FRANCE)											
PAPEETE/NTAA											
Christchurch/NZCH	S	LDD/d	2400 bps	X.24	IA-5						
INDIA											
MUMBAI - M/VABB											
Bangkok/VTBB	M	LDD/d	2400 bps	X.25	IA-5						
Kolkata/VECC	S	LDD/d	9600 bps	X.25	IA-5						
Colombo/VCCC	M	LDD/d	64 Kbps	X.25	IA-5						
Karachi/OPKC	M	SAT/d	2400 bps	None	IA-5						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	300 baud	None	ITA-2						Dial up
KOLKATA - S/VECC											
Dhaka/VGZR	S	LDD/d	64 Kbps	X.25	IA-5						
Mumbai/VABB	S	LDD/d	9600 bps	X.25	IA-5						
DELHI - S/VIDD											
Tashkent/UTTT	S	SAT/a	50 baud	None	ITA-2						
CHENNAI - S/VOMM											
Kuala Lumpur/WMKK	S	LDD/d	9600 bps	X.25	IA-5						Note 1, 2
INDONESIA											
JAKARTA - S/WIII											
Brisbane/YBBB	S	SAT/d	9600 bps	X.25	IA-5						Note1,2
Singapore/WSSS	S	SAT/d	2400 bps	X.25	IA-5						Note 2

Table CNS-1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
JAPAN											
TOKYO - M/RJAA											
Beijing/ZBBB	M	LDD/d	9600 bps	X.25	IA-5						
Hong Kong/VHHH	M	LDD/d	9600 bps	X.25	IA-5						
Russian Federation/UHHH	M	LTT	2400 bps	None	IA-5						(Khabarovsk)
Russian Federation/UUUU	M	LTT	200 baud	None	IA-5	LDD	2400 bps	None	IA-5		Coordination with Russian Federation in progress
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/d	9600 bps	X.25	IA-5						
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	LDD/d	2400 bps	None	IA-5						
LAO PDR											
VIENTIANE - S/VLVT											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Hanoi/VVNB	S	SAT/d	9600 bps	None	IA-5						
MALAYSIA											
KUALA LUMPUR-S/WMKK											
Bangkok/VTBB	S	SAT/d	2400 bps	X.25	IA-5						Note 1, 2
Brunei/WBSB	S	LTT	2400 bps	None	ITA-2	LDD/d	9600 bps	X.25	IA-5	12/05	Note 1, 2
Chennai/VOMM	S	LDD/d	9600 bps	X.25	IA-5						Note 1, 2
Singapore/WSSS	S	SAT/d	1200 bps	X.25	IA-5						Note 2
MALDIVES											
MALE - S/VRMM											
Colombo/VCCC	S	LTT	50 baud	None	ITA-2	SAT/d	9600 bps	X.25	IA-5	12/04	Note 2
MARSHALL ISLAND											
MAJURO - S/PKMJ											
United States/KSLC	S	SAT/d	1200 bps	X.25	IA-5						

Table CNS-1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
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						
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	300 baud	None	IA-5						Note 2
Russian Federation/UII	S	LTT	50 baud	None	ITA-2						(Irkutsk)
MYANMAR											
YANGON - S/VYYY											
Bangkok/VTBB	S	SAT/d	300 baud	COP-B	IA-5						Note 2
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5						Note 1,2
NAURU											
NAURU - S/ANAU											
Brisbane/YBBB	S					SAT/d	2400 bps	X.25	IA-5		Internet as interium measur
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	LDD/d	2400 bps	X.25	IA-5						Note 2

Table CNS-1A AFTN PLAN

State/Station	Cat.	CURRENT				PLANNED				Target date of implementation	Remarks
		Type	Signalling Speed	Protocol	Code	Type	Signalling Speed	Protocol	Code		
1	2	3	4	5	6	7	8	9	10	11	12
NEW ZEALAND											
CHRISTCHURCH-T/NZCH											
Faleolo/NSFA	S	LDD/d	2400	X.25	IA-5						
Brisbane/YBBB	T	LDD/d	2400 bps	X.25	IA-5						Note 2
Nadi/NFFN	S	LDD/d	2400 bps	X.25	IA-5						Note 1, 2
Niue/NIUE	S										Currently by FAX
Papeete/NTAA	S	SAT/d	2400 bps	X.25	IA-5						
Rarotonga/NCRG	S	LDD/d	2400 bps	None	IA-5						
Tongatapu/NFTF	S	LDD/d	2400 bps	None	IA-5						
USA/KSLC	S	LDD/d	9600 bps	X.25	IA-5						
NIUE IS											
NIUE - S/NIUE											
Christchurch/NZCH	S										Currently by FAX
PAKISTAN											
KARACHI - M/OPKC											
Beijing/ZBBB	M	LTT	50 baud	None	ITA-2	LDD/a	64Kbps	None	IA-5	12/04	
Mumbai/VABB	M	SAT/d	2400 bps	None	IA-5						Note 2
Kabul/OAKB	S	SAT/d	300 baud	None	IA-5						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	LDD/d	300 baud	None	ITA-2						Note 2
Singapore/WSSS	S	LDD/d	300 baud	None	ITA-2				IA-5		Note 1, 2
Taibei/RCTP	S	LTT	75 baud	None	ITA-2	LDD/d	300 baud	None	IA-5		Note 1, 2
REPUBLIC OF KOREA											
SEOUL - S/RKSS											
Beijing/ZBBB	S	SAT/d	9600 bps	X.25	IA-5						
Tokyo/RJAA	S	LDD/d	9600 bps	X.25	IA-5						Note 2
SAMOA											
FALEOLO - S/NSFA											
Chistchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5						

Table CNS-1A AFTN PLAN

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
SINGAPORE											
SINGAPORE-M/WSSS											
Bahrain/OBBI	M	LTT	200 baud	None	ITA-2	LDD/d	96000 bps	None	IA-5	09/04	
Bangkok/VTBB	M	LDD/d	9600 bps	X.25	IA-5						Note 2
Brisbane/YBBB	M	LDD/d	2400 bps	X.25	IA-5						
Brunei/WBSB	S	LDD/d	2400 bps	X.25	IA-5						
Colombo/VCCC	M	LDD/d	9600 bps	X.25	IA-5						
Ho-Chi-Minh/VVTS	S	SAT/a	300 baud	None	IA-5						
Jakarta/WIII	S	SAT/d	2400 bps	X.25	IA-5						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	LDD/d	300 baud	None	ITA-2				IA-5		
Tokyo/RJAA	M	LDD/d	9600 bps	X.25	IA-5						
SOLOMON IS.											
HONIARA - S/AGGG											
Brisbane/YBBB	S					LTT	75 baud	None	IA-5		Internet as intermedium measur
SRI LANKA											
COLOMBO - M/VCCC											
Mumbai/VABB	M	LDD/d	64 kbps	X.25	IA-5						
Male/VRMM	S	LTT	50 baud	None	ITA-2	SAT/d	9600 bps	X.25	IA-5	12/04	Note2
Singapore/WSSS	M	LDD/d	9600 bps	X.25	IA-5						
THAILAND											
BANGKOK - M/VTBB											
Mumbai/VABB	M	LDD/d	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						
Hong Kong/VHHH	M	LDD/d	64 Kbps	X.25	IA-5						ATN link carrying AFTN Traffic
Kuala Lumpur/WMKK	S	SAT/d	2400 bps	X.25	IA-5						Note 1, 2
Phnom Penh/VDPP	S	SAT/d	300 baud	None	IA-5						Note 2
Rome/LII	M	LDD/d	2400 bps	X.25	IA-5						
Singapore/WSSS	M	LDD/d	9600 bps	X.25	IA-5						Note 2
Vientiane/VLVT	S	SAT/d	300 baud	COP-B	IA-5						
Yangon/VYYY	S	SAT/d	300 baud	COP-B	IA-5						Note 2
TONGA											
TONGATAPU - S/NFTF	S										
Cristchurch/NZCH		LDD/d	2400 bps	None	IA-5						
TUVALU											
FUNAFUTI - S/NGFU											
Nadi/NFFN	S					LDD/d	2400 bps	None	IA-5	12/05	Dial-up

Table CNS-1A AFTN PLAN

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
UNITED STATES											
USA-M/KSLC											
Brisbane/YBBB	M	SAT/d	2400 bps	X.25	IA-5						
Christchurch	S	LDD/d	9600 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						Internet as interim measure
VIET NAM											
HANOI-S/VVNB											
Vientiane/VLVT	S	SAT/d	9600 bps	None	IA-5						
Ho-Chi-Minh/VVTS	S	SAT/d	9600 bps	None	IA-5						
Guangzhou/ZGGG	S	SAT/d	2400 bps	None	IA-5						
HO-CHI-MINH - S/VVTS											
Bangkok/VTBB	S	SAT/d	2400 bps	None	IA-5						
Hanoi/VVNB		SAT/d	9600 bps	None	IA-5						
Hong Kong/VHHH	S	SAT/d	2400 bps	None	IA-5						
Singapore/WSSS	S	SAT/a	300 baud	None	IA-5						
WALLIS IS. (FRANCE)											
WALLIS - S/NLWW											
Nadi/NFFN	S					LDD/A	2400 bps	None	IA-5		Current routing via Noumea Circuit will be implemented when traffic justifies.

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.		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.	Completed
3		Subject: ATN major elements. Task: Provide performance and functional requirements of ATN.	A	1) Develop ATN Technical Documents. ~~- Security~~ System integrity - Performance - System Management	~~2004~~ (2005 Monitor development in ACP) ~~2004~~ 2005 ~~2004~~ Completed
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 Completed

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
5		Subject: Planning and implementation information in ANP. Task: Develop G/G part of the CNS FASID.	A	Development of detail description for the existing tables and Charts for the G/G part of the CNS FASID.	
				1) Table CNS 1B – ATN Router Plan 2) Table CNS 1C – ATS MHS 3) Table CNS 1D – AIDC Routing Plan	Completed ~~2004~~ Completed 2005
6		Subject: ATN Documentation Task: Development of ATN Routing Documentations and ICDs.	A	Development of ATN Documents: 1) A Router ICD 2) A Routing policy for IDRP 3) A Routing policy for MTA 4) Directory of Service 5) An AMHS ICD 6) An AIDC ICD	 Completed Completed ~~2004~~ 2005 ~~2004~~ 2005 Completed ~~2004~~ 2005
7		Subject: Use of the public Internet Task: Develop guidance material for the use of the public internet technology to support AFTN, where required.	A	Study the possibility of using the public Internet and develop guidance material for its use to support low speed AFTN stations, as an interim measure, with particular emphasis on security and reliability.	Completed
8		Subject: Use of IP Task: Develop guidance material for the use of IP as a Sub-Network for ATN	B	In accordance with the work being performed by ACP, develop guidance material for the support of IP as a Sub-Network of the ATN, with particular emphasis on system compatibility between adjacent centers and security.	(2005 Monitor development in ACP)

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
9		Subject: AMHS Naming Registration Task: Develop registration forms for assigning AMHS address for the region	A	To develop an AMHS Naming Registration Planning Document for registering the AMHS naming conventions and assignments to be used within the region. To develop procedures for completing the Form.	~~2004~~ Completed 2005
10		Subject: AFTN/AMHS Transitional/Operational Procedures Tasks: Revise and develop transitional/operational procedures applicable to the use of the AMHS.	A	To review existing AFTN transitional/operational procedures and develop a new transitional and operational procedures applicable to the operation and use of the AMHS.	~~2004~~ (2005 Monitor development in ACP)

CNS/MET WORKING GROUP ON AMS DATA LINK STUDY

Term of Reference

Develop regional strategies for the provision of AMS communications data links for the near-term and long-term for consideration by CNS/MET SG/9 meeting to held 11-15 July 2005.

Membership

The Working Group will consist of members from Australia; China (to be confirmed), Hong Kong, China; India, Japan (to be confirmed); USA; SITA, ARINC (to be contacted) and IATA (to be confirmed).

Facilitator:
Member from Australia will act as facilitator until a Rapporteur is appointed by the Working Group

The Working Group will consult air navigation services providers, airlines, communications service providers, aircraft and avionics manufacturers.

Considerations:

- Statement of the operations requirement
- SARPs compliant technology
- Ability to meet the performance requirement
- Commonality with AOC data communications
- Market place availability of technology
- Existing and planned fitment
- Global interoperability
- Inclusive of all levels of operators
- Acquisition and operational costs
- The form and style of existing regional strategies

Working method:
by electronic correspondence initially between members.

Target date for completion:
31 May 2005

UPDATED STRATEGY FOR THE PROVISION OF PRECISION APPROACH AND LANDING GUIDANCE SYSTEMS

Considering:

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

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

c) the availability of ICAO SARPs and guidance material for GNSS with augmentation to support Cat I precision approach and approach and landing with vertical guidance (APV);

d) the knowledge that APV operations may be conducted using GNSS with augmentation as required or barometric vertical guidance and GNSS or DME/DME RNAV lateral guidance;

e) APV operations provide enhanced safety and generally lower operational minima as compared to non-precision approaches;

~~d)~~ f) the knowledge that GNSS without augmentation can support non-precision approaches and that augmented GNSS- based systems is expected to be available to support Category I operations by year ~~2006~~ 2009.This date may be brought forward with the lunch of another navigation satellite constellation.

~~e)~~ g) GNSS with augmentation to support category II and III operations is expected to be available in 2010-2015 time frame;

~~f)~~ h MLS Cat I is operational and ground and airborne Cat III B certification is in progress? (contact UK for status of certification);

~~g)~~ i a multi-modal airborne approach and landing capability is necessary and expected to be available;

~~h)~~ j the definition of Required Navigation Performance for approach, landing and departure operations;

~~i)~~k 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 aircraft equipage.

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

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

b) Implement GNSS with augmentation as required for APV and ~~to support~~ Category I ~~and APV~~ operations where operationally required and economically beneficial;

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

d) Introduce applicable Required Navigation Performance (RNP) for approach, landing and departure operations in accordance with ICAO provisions;

e) Conduct necessary on-going GNSS and RNP education and training for operational personnel to ensure safe operations;

f) Implement MLS where operational requirements cannot be satisfied by implementation of ILS or GNSS;

g) Protect radio frequency spectrum of ILS, MLS and GNSS since the transition from ILS to GNSS and /or MLS will be evolutionary and will take some time.

h) Promote the use of APV operations, particularly those using GNSS vertical guidance, to enhance safety and accessibility.

UPDATED STRATEGY FOR THE IMPLEMENTATION OF GNSS NAVIGATION CAPABILITY IN THE ASIA/PAC 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 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 system performance;

6) Airworthiness and operational approvals allowing the current GNSS to be used 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 systems;

8) Regional augmentation systems include both satellite-based (SBAS) and ground-based systems (GBAS);

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

10) The vulnerability of GNSS to radio interference and adverse effect of ionosphere;

~~10)~~ 11) The regional navigation requirements are:

(a) RNP10/RNP4 for en-route;
(b) RNP4 for *transition to* terminal phase of flight;
(c) RNP1 for terminal phase of flight;
(d) NPA/APV for approaches and departures; and
(e) Precision approaches at selected airports.

The general strategy for the implementation of GNSS in the ASIA/PAC Region is detailed below:

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 Air Navigation Plan for CNS/ATM Systems;

3) During transition to GNSS, sufficient ground infrastructure for current navigation systems must remain available. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip with GNSS to attain equivalent navigation service;

4) Implementation shall be in full compliance with ICAO SARPs and PANS;

5) Introduce the use of GNSS for en-route, terminal and approach navigation;

6) States are encouraged to implement future GNSS approvals based on TSO C145/146 receiver standards or equivalents;

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, taking due consideration of the need of State aircraft.

9) As GNSS is introduced for en-route navigation, States~~/Regions~~ should coordinate to ensure that harmonized separation standards and procedures are developed and introduced concurrently in all flight information regions along major traffic flows to allow for a seamless transition to GNSS-based navigation.

10) The introduction of GNSS offers the possibility to remove conventional ground-based navigation aids. However States should approach this with caution to ensure that safety is not compromised, such as by performance of safety assessment and consultation with users through regional air navigation planning process.

~~9)~~ 11) States undertake a co-coordinated R & D programme on GNSS implementation and operation;

~~10)~~ 12) ICAO and States should undertake education and training to provide necessary knowledge in GNSS theory and operational application, including RNP, and

~~11)~~ 13) 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.

Note1: Identified SBAS systems are EGNOS, MSAS and WAAS. The MSAS is expected to be available for providing augmentation for the ASIA/PAC region.

SUBJECT/TASK LISTS OF THE ADS-B STUDY AND IMPLEMENTATION TASK FORCE

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
1	APANPIRG Concl.13/19 TOR	Subject: Selection of links for near term and long term. Task: 1) Select near term link; 2) Select long tern link.	A	1) SSR Mode S 1090 ES has been selected for the near term; 2) Additional data links may be specified as necessary.	Completed TBD
2	APANPIRG Concl. 14/21	Subject: Guidance material for implementation of ADS-B in ASIA/PAC region. Task: Develop a guidance package	A	1) Sample Business case component; 2) Based on OPLINK Concept of use and other ICAO Docs for ADS-B air-ground surveillance service.	2005
3	APANPIRG Concl. 14/21	Subject: Report of ADS-B problem. Task: Establish a problem reporting system	A	Develop a database and a form of report	2004 /Australia
4		Subject: Draft amendment proposal to SUPPs 7030 Regional Supplemental Procedures Task: Prepare a draft for consideration by ATM/AIS/SAR Sub-Group of APANPIRG.	B	Prepare a draft for amendment to Doc7030 for implementation of ADS-B in the ASIA/PAC region pending separation criteria developed by relevant ICAO Panel.	2005/ICAO Regional Office

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
5	APANPIRG Concl. 14/21	Subject: ASIA/PAC ADS-B operational manual Task: Develop operational procedure manual for using ADS-B.	A	Develop a draft operational manual (include material on NOTAM and available manual data)	2005 New Zealand/ USA
6	APANPIRG Concl. 14/21	Subject: Coordination between States at planning level Task: Coordination for timing of implementation and designate focal point of contact, points of contact for regulators, airframes & ground systems.	A	1) Develop an coordinated implementation plan by city pairs; 2) Inform ICAO regional office names of designated focal point of contact.	2005/States concerned 2004/States
7	APANPIRG Concl. 14/21	Subject: Regional implementation plan Task: Develop a Regional implementation plan taking into account the individual national plans in accordance with a coordinated plan between city pairs.	B	1) States present their ADS-B plans (including any necessary associated air ground voice communication) as WPs to ADS-B study and implementation Task Force; 2) Implementation date, sites being considered and plans for mandates (if any) should be specified; 3) Develop optimal regional plan based on State inputs.	2005

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
8		Subject: Number of airframes fitted Task: Report on number of airframes fitted	A	Collect and report to the Task Force information on types, operators (numbers of each) and NUC (NIC/NAC/SIL)	2005/USA

SADIS STRATEGIC ASSESSMENT TABLES
CURRENT AND PROJECTED DATA VOLUMES 2005-2008

Note 1: 1 octet = 1 byte = 1 character;

Note 2: low-level (SWL) <FL100; medium level (SWM): FL100 – FL250; high-level (SWH): >FL250.

Table 1. ASIA— OPMET data volumes

Main routing(s): AFTN, direct line (GTS)

OPMET data	*Current 2004*	*Projected 2005*	*Projected 2006*	*Projected 2007*	*Projected 2008*
ALPHANUMERIC DATA					
Number of **FC bulletins** issued per day	34	38	44	50	55
Average number of stations per FC bulletin	4	4	4	4	4
Number of **FT bulletins** issued per day	165	170	175	180	185
Average number of stations per FT bulletin	4	4	4	4	4
Number of **SA bulletins** issued per day	872	875	880	885	890
Average number of stations per SA bulletin	4	4	4	4	4
Number of **SP bulletins** issued per day	24	25	30	35	40
Number of **SIGMET** bulletins issued per day	13	15	15	20	20
Number of **FK/FV bulletins** issued per day	0	1	1	1	1
BINARY DATA					
Number of other bulletins issued per day	0	0	0	2	2
(please specify header(s))					
Average number of stations per bulletin	-	-	-	1	1
TOTALS					
Total number of OPMET bulletins per day	1109	1121	1141	1166	1186
Average size of OPMET bulletin (bytes)	350	350	350	350	350
Total estimated OPMET data volume per day (bytes)	388K	392K	399K	408K	415K

Note: Provision is made for the potential distribution of binary (BUFR) encoded volcanic ash SIGMETs during years 2007 and 2008.

Table 2. ASIA — BUFR data volumes

Main routing(s): GTS

BUFR SIGWX messages	*Current 2004*	*Projected 2005*	*Projected 2006*	*Projected 2007*	*Projected 2008*
WMO Header				N/A	N/A
Time(s) of issue of data (UTC)	-	-	-	Misc	Misc
Average size of message (bytes)	-	-	-	20K	20K
Data level (e.g. FL range or low (SWL)/medium (SWM) level)	-	-	-	Misc	Misc
Validity time(s) of data VT (UTC)	-	-	-	Misc	Misc
TOTALS					
Total number of BUFR messages per day	0	0	0	2	2
Average size of messages (bytes)	-	-	-	20K	20K
Total estimated volume of BUFR messages per day (bytes)	0	0	0	40K	40K

Note: Provision is made for the potential distribution of BUFR encoded VAGs during years 2007 and 2008.

Table 3. ASIA — AIS data volumes

Main routing(s): AFTN

AIS (Subject to statement of an operational requirement)	*Current 2004*	*Projected 2005*	*Projected 2006*	*Projected 2007*	*Projected 2008*
ALPHANUMERIC AIS DATA (e.g. NOTAMs, ASHTAMs)	**ASHTAMS and NOTAMS related to volcanic ash**				
Bulletin type	-	No requirement	ASHTAM	ASHTAM	ASHTAM
Number of bulletins issued per day			2	2	2
Average size of each bulletin (bytes)			5K	5K	5K
Bulletin type			NOTAM	NOTAM	NOTAM
Number of bulletins issued per day			2	2	2
Average size of each bulletin (bytes)			5K	5K	5K
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	0		4	4	4
Average size of AIS bulletin (byte)	-		5K	5K	5K
Total number of AIS charts issued per day	0		0	0	0
Average size of AIS chart (byte)	-		-	-	-
Total estimated volume of AIS data per day (bytes)	0		10K	10K	10K

Note: Provision is made for the distribution of ASHTAMS and NOTAMS related to volcanic ash during years 2206, 2007 and 2008.

— — — — — — — —

ASIA/PAC WAFS Implementation Plan and Procedures

~~6~~7th Edition - July 200~~3~~4

ASIA/PAC WAFS Implementation Plan and Procedures

~~6~~7th Edition - July 200~~4~~3

Introduction

1. The Asia/Pacific WAFS Implementation Plan and Procedures has been revised to take account of progress already made and in recognition of the impact of the migration to GRIB and BUFR.

The Implementation of WAFS

2. This plan is based on the understanding that the implementation of WAFS in the Asia/Pacific Regions involves:

a. Production and dissemination by the WAFCs of global forecast winds, temperatures, tropopause height, tropopause temperature and humidity in GRIB format.

b. The transfer of responsibility for the production for SWH from RAFCs to the two WAFCs, and hence the closing down of the RAFCs.

c. The implementation of a communication system/s for the distribution of WAFS products in the Asia/Pacific Regions, to all the States that require the products in support of international air navigation. This will be achieved via satellite broadcast (SADIS and ISCS/2). States may need to use an alternative distribution system.

d. The production and distribution (via satellite broadcast) by the WAFCs, of Global, quality controlled SWH (FL 250 - 630) in BUFR format.

e. The production and distribution (via satellite broadcast) by the WAFCs of quality controlled SWM (FL 100 - 250) in BUFR format over limited geographical areas where required by PIRGs.

f. The capability of States to convert BUFR and GRIB messages to graphical products on an operational basis.

SIGWX Charts

3. The table below shows the status of the SIGWX charts and responsible WAFCs.

Chart area & responsible WAFC
G London (SWH)
K London (SWH)
D London (SWH)
J Washington (SWH)
E London (SWH)

F Washington (SWH)

I	Washington (SWH)
M	Washington (SWH)

4. There will be an ongoing requirement for NMSs to monitor the quality of WAFC products.

5. Action required to be taken by States to adhere to the provision of Annex 3 to ensure the relevant advisories for tropical cyclones, volcanic ash, the accidental release of radio active material and SIGMETs are made available to the WAFCs in a timely manner.

6. The SIGWX charts produced by WAFC Washington are also available on the US NWS Aviation Weather Center Internet site at: http://www.nws.noaa.gov/iscs. All WAFC London products are available on a password controlled internet-based FTP site, together with appropriate GRIB and BUFR decoding facilities.

7. States are encouraged to send comments to the WAFCs about the quality and accuracy of SIGWX on a frequent and regular basis. Contact details for comments are:

WAFC Washington

i. NWS/Aviation Weather Center
Attention: Mr Mike Campbell
7220 NW 101st Terrace
Kansas City, Missouri
USA 64153-2371
ii. E-mail addressed to: mike.campbell@noaa.gov
iii. Fax number: 1 816 880 0650

WAFC London

i. The Met. Office
Attention: Mr. Nigel Gait
International Aviation Manager
Fitzroy Road
Exeter
Devon EX1 3PB
United Kingdom
~~Civil Aviation Branch~~
~~Sutton House~~
~~London Road~~ ~~Bracknell~~
~~Berkshire RG12 2SY, United Kingdom~~
ii. E-mail addressed to: nigel.gait@metoffice.com
iii. Fax number: +44 (1392~~44~~) 885 681~~54 156~~

Distribution of WAFS Products

8. Most States in the Asia/Pacific Regions are receiving wind, temperature and humidity forecasts in GRIB, and SIGWX in T4 facsimile format from the two WAFCs by VSAT, either SADIS or ISCS/2. A range of WAFS products are available via the Internet and through bilateral arrangements with neighbouring national meteorological services.

9. The two WAFCs will distribute by satellite broadcast Global, quality controlled SWH and quality controlled SWM for limited geographical areas (Note: WAFC London started the operational distribution of Global, quality controlled SWH by satellite broadcast in June 2003) . Once suitable decoding and visualization software has been acquired by States in the Asia/Pacific Regions, to provide them with the ability to operationally 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.

Indicative Timetable for Achieving the Final Phase of WAFS

10. The table given in Attachment 1 provides an indicative timetable for the implementation of WAFS within the Asia/Pacific Regions.

Volcanic Ash Advisory Centres (VAACs)

11. The VAACs will have an ongoing role of monitoring WAFS SIGWX charts that cover their areas of responsibility, and advising the appropriate WAFC to ensure the accurate inclusion of the volcanic ash symbol.

Tropical Cyclone Advisory Centres (TCAC)

12. The TCACs will have an ongoing role of monitoring WAFS SIGWX charts that cover their areas of responsibility, and advising the appropriate WAFC to ensure the accurate inclusion of the tropical cyclone symbol.

Attachment

ASIA/PAC WAFS Implementation Plan and Procedures

Indicative Timetable for Implementation of WAFS

Item	Task/Stage of Implementation of WAFS	Anticipated Date
1	WAFC London products on access controlled internet site	completed
2	The establishment of back-up distribution arrangements for WAFS products	completed
3	Training in the operational conversion of GRIB forecasts to Wind / Temp charts	late 2002 (SADIS) ~~late 2004 / early~~January 2005 (ISCS)
4	All states that receive GRIB products capable of converting GRIB forecasts to Wind / Temp charts	early 2005
5	Removal of T4 Facsimile Wind / Temp charts from the satellite broadcast	1 July 2005
6	Training in the operational conversion of BUFR to SIGWX charts	late 2002 (SADIS) ~~late 2004 / early~~January 2005 (ISCS)
7	States having the ability to operate the decoding software to convert BUFR SIGWX messages into graphical format	early 2005
8	The satellite distribution by the two WAFCs of global SWH and of SWM for limited geographical areas in BUFR format	June 2003 (SADIS SWH) late 2004 (SADIS SWM) ~~September~~late 2004~~3~~ (ISCS SWH & SWM)
9	Removal of T4 Facsimile SIGWX products from the satellite broadcast	1 July 2005

— — — — — — — —

ASIA/PAC WAFS IMPLEMENTATION TASK FORCE

1. Terms of Reference

Expedite the implementation of the World Area Forecast System (WAFS) in the Asia and Pacific Regions.

2. Work Programme

The work to be addressed by the ASIA/PAC WAFS Implementation Task Force (WAFS/I TF) includes:

(a) Coordinating the replacement of Wind/Temp charts in T4 facsimile format by GRIB encoded products in the Asia and Pacific Regions.

(b) Coordinating the replacement of SIGWX charts in T4 facsimile format by BUFR encoded products in the Asia and Pacific Regions.

(c) Coordinating the migration of SADIS 1G service to 2G service in the Asia and Pacific Regions.

(d) Coordinating the provision of assistance to States to ensure that WAFS can be effectively implemented in the Asia and Pacific Regions.

(e) Providing inputs (via the CNS/MET SG) to APANPIRG on the regional planning and development of WAFS for coordination with the WAFSOPSG.

(f) Keeping the ASIA/PAC WAFS Implementation Plan and Procedures up to date.

The work is expected to be carried out primarily by correspondence.

3. Composition

The Task Force is composed by experts from:

Australia; Hong Kong, China (Chairman); India; Japan; New Zealand; Singapore; Thailand; United Kingdom; United States and IATA.

— — — — — — — —

TERMS OF REFERENCE OF ASIA/PAC OPMET MANAGEMENT TASK FORCE

ASIA/PAC OPMET MANAGEMENT TASK FORCE (OPMET/M TF)

1. Terms of Reference

- Review the OPMET exchange schemes in the ASIA/PAC and MID Region and develop proposals for their optimization taking into account the ~~current trends~~ requirements by the aviation users and the current trends for~~in the~~ global OPMET exchange;

- Develop monitoring and management procedures related to ~~the~~ ROBEX exchange and other exchanges of OPMET information;

- ~~Keep up to date~~Regularly update the regional guidance material related to OPMET exchange;

- Liaise with ~~similar~~ other groups dealing with communication and/or management aspects of the OPMET exchange in ASIA/PAC and ~~in~~ other ICAO Regions (ASIA/PAC ATN Transition TF, BMG EUR Region, CNS/MET SG MID Region, etc.).

2. Work Programme

The work to be addressed by the ASIA/PAC OPMET ~~Exchange~~ Management Task Force includes:

(a) to examine the existing ~~requirements~~ and any new requirements for ~~the~~ OPMET exchange in ASIA/PAC and MID regions and ~~to~~ assess the feasibility of satisfying these requirements, taking into account the availability of the data;

(b) to keep under review the ROBEX scheme and other OPMET exchange schemes and ~~based on this review to~~ prepare proposal for updating and optimizing of the schemes;

(c) to review and update the procedures for interregional OPMET exchange and ~~for~~ ensure ~~transmission~~ the availability of the required ~~regional~~ ASIA/PAC and MID OPMET data ~~to~~ for the AFS satellite broadcasts ~~providers~~ (ISCS and SADIS);

(d) to keep under review and provide timely amendments of the regional guidance materials on the OPMET exchange; to ensure that guidance material ~~and to include~~covers procedures for the exchange of all required OPMET ~~message~~ data types: SA, SP, FC, FT, WS, WC, WV, FK, FV, UA;

(e) to conduct trials and develop procedures for monitoring and management of the OPMET ~~information~~exchange; to foster implementation of quality management of OPMET data by the ROBEX centres and the RODBs~~, based on the procedures used at the OPMET data banks~~;

Note: It is recommended that the EUR OPMET ~~update~~ quality control and management procedures ~~to~~ be reviewed and utilized~~used as the bases for~~ in ~~development~~ developing~~of~~ similar procedure for the ASIA/PAC and MID Regions.

3. Composition

(a) The Task Force is composed by experts from:

Australia (Rapporteur)~~,~~; China~~,~~; Fiji~~,~~; Japan~~,~~; Hong Kong, China; Indonesia, Singapore~~,~~; Thailand~~,~~; United Kingdom and United States; ~~.~~

(b) ~~IATA~~Representatives of IATA, EUR BMG and MID OPMET Bulletin Board are ~~is~~ invited to participate in the work of the Task Force

— — — — — — — —

INTERNATIONAL CIVIL AVIATION ORGANIZATION

DRAFT

ROBEX HANDBOOK

Twelfth Edition — 2004

Prepared by the ICAO Asia and Pacific Office
and Published under the Authority of the Secretary General

TABLE OF CONTENTS

List of Appendices:

Note: The full text of the draft 12th edition of the ROBEX Handbook is available on ICAO web site with the URL:

http://www.icao.int/cgi/goto_m_apac.pl?/apac/meetings.htm

(Select Eighth meeting of the CNS/MET Sub-group and after that select WP/22 from the list of working and information papers)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

DRAFT

ASIA/PACIFIC REGIONAL INTERFACE CONTROL DOCUMENT OPMET DATA BANK ACCESS PROCEDURES

2004

TABLE OF CONTENTS

Note: The full text of the draft 3rd edition of the ASIA/PACIFIC REGIONAL INTERFACE CONTROL DOCUMENT - OPMET DATA BANK ACCESS PROCEDURES is available on ICAO web site with the URL:

http://www.icao.int/cgi/goto_m_apac.pl?/apac/meetings.htm

(Select Eighth meeting of the CNS/MET Sub-group and after that select WP/23 from the list of working and information papers)

— — — — — — — —

ASIA/PAC OPMET Management Task Force (OPMET/M TF/2) of CNS/MET Sub-group of APANPIRG

AIREP Survey

(AIREP Team comprising Singapore and Australia –assisted by RODB's and ROBEX)

1. Introduction

1.1 The Second Meeting of ASIA/PAC OPMET Management Task Force reviewed the ROBEX Handbook and a draft new version (12th edition) has been created. The meeting could not update Chapter 9 of the Handbook, AIREP Exchange, due to the lack of up-to-date information regarding the AIREP exchange carried out by the States in the ASIA/PAC and MID Regions. Therefore, it was decided that a survey with the ASIA/PAC and MID States on AIREP exchange should be conducted in order to verify the current AIREP exchange procedures, as well as to receive feed-back on the availability and the usage of the AIREP bulletins.

1.2 OPMET/M TF/2 meeting agreed that a small sub-group, named AIREP Team, should carry out a survey on the current status of AIREP exchange in the ASIA/PAC and MID regions. The AIREP Team developed a questionnaire to be circulated to all ROBEX centres involved in collection and dissemination of AIREP messages/bulletins. The survey would be carried out over a 10-day sampling period during which all ROBEX centres will be invited to file the AIREP bulletins received/transmitted and to forward this information to the AIREP team for processing.

1.3 In their response to the survey States should take into account the Annex 3 provisions for air-reporting and the regional requirements, which are reflected in the ROBEX Handbook.

1.4 It is expected that based on the results of the survey, the regional procedures for AIREP exchange will be updated and brought in line with the current ICAO requirements set in the Annex 3 and the related documents.

2. Objective and expected goals

2.1 The main objective of this survey is to provide information on the existing procedures for the collection and dissemination of AIREP messages and bulletins and the availability of AIREP information in the ASIA/PAC and MID regions under the requirements specified in the regional guidance material (ROBEX Handbook), in order to develop updated procedures for the AIREP exchange compliant with the Annex 3 requirements.

2.2 The main goals to be achieved are:

- To assess if the procedures used by the States for collection and dissemination of AIREP are in line with the Annex 3 requirements;
- To assess if the procedures in use ensure the transmission of all required AIREP information to the WAFCs;
- To check the procedures used by the ROBEX centres and the availability of AIREP bulletins based on a 10-day sampling period
- To show the availability of special air-reports;
- To check the correctness of the format of the AIREP messages and bulletins;
- To allow the OPMET/TF to assess the adequacy of the AIREP exchange under the ROBEX scheme and make any proposal thereupon.

-

3. Survey Procedures

3.1 The States are requested to provide information on the procedures used by their ATS units and MWOs in collecting and disseminating AIREP messages by answering the questions in the questionnaire provided in the **Appendix A**.

3.2 ROBEX centres are requested to carry out a 10-day sampling period for the AIREP bulletins and to provide summaries and/or filed information, as follows:

3.2.1 Participating ROBEX centres

All ASIA/PAC and MID RODBs and ROBEX centres are invited to participate in the AIREP survey. Each centre is requested to advise the AIREP team if they are unable to take part in the survey by advising the AIREP team prior to the commencement of the sampling period.

ROBEX Centres:

ASIA/PAC Regions

Beijing	Colombo	Delhi	Hong Kong	Jakarta
Karachi	Kolkata	Kuala Lumpur	Mumbai	Port Moresby

MID Region

Baghdad	Bahrain	Beirut	Jeddah	Tehran

RODB:

Bangkok	Brisbane	Nadi	Singapore	Tokyo

3.2.2 AIREP Bulletin Sampling

3.2.2.1 To ensure that comprehensive sampling is carried out, a 10 day AIREP bulletin sampling period has been selected. The sampling period will last from 0000 UTC on 1 October until 2359 UTC on 10 October 2004. All participating centres should make arrangements that the required information is stored during the sampling period.

3.2.2.2 The survey will involve two separate components:

- AIREP Bulletin information received or collected by the centre; and
- AIREP Bulletin information compiled and disseminated by the centre

3.2.2.3 The following information is to be recorded or notated

For AIREP bulletins received or collected by the centre
1. Collection Date
2. Number of daily AIREP (UA) Bulletins received at ROBEX Centre via AFTN
3. UA bulletin Header (TTAAii CCCC) sent by MWOs
4. Originator of the UA bulletin
5. Number of AIREP messages in the bulletin (if available)
6. Any Special Air-Reports (ARS) received; type of ARS (volcanic activity etc.).
7. Remarks or comments, including information on the correctness of the bulletin/message format in accordance with ICAO Annex 3

For AIREP bulletins compiled and/or disseminated by the centre
1. Collection Date
2. Number of daily UA bulletins compiled, generated and distributed via AFTN
3. UA bulletin Header (TTAAii CCCC) used on the generated bulletin
4. AFTN address/s used to distribute the bulletin, including WAFC address/s used to distribute AIREP
5. Number of AIREP messages in the bulletin (if available)
6. Any Special Air-Reports (ARS) generated; type of ARS (volcanic activity etc.)
7. Remarks or comments, including information on the correctness of the bulletin/message format in accordance with ICAO Annex 3

3.3 Format of the data

3.3.1 The data sampled by the ROBEX centres and RODBs should be summarized and the summaries presented in the table format using the forms provided herewith in the **Appendix A** and **Appendix B**. Some examples of AIREP bulletins are provided in the **Appendix C**.

3.3.2 If the ROBEX centre is not capable of doing the summary, it is requested that the sampled "raw" data is sent to the AIREP team for processing. In any case, it is desirable that all AIREP bulletins collected during the sampling period are stored and send to the AIREP team for further processing, as necessary. An example of some sample survey information has been included as Attachment C.

3.3.3 For ROBEX centres that currently do not handle AIRMET information it is requested to provide a simple message describing the reasons for which AIRMET is not collected/distributed and any future plans thereupon.

3.4 Submitting completed forms or compiled information

3.4.1 At the end of the sampling period, completed forms or compiled sampling information is to be forwarded to the AIREP collection point as soon as practicable and no later than **22 October 2004.**

3.4.2 Participating ROBEX centres/RODBs can **either**:

- Forward an electronic copy of all AIREP information collected during the sample period to the following email address: aidan.cooley@airservicesaustralia.com ; or
- Complete and forward the attached AIREP Sampling Sheets (Attachment A and B) by electronic mail to aidan.cooley@airservicesaustralia.com or
- Post any materials/results to:
  Aidan Cooley (AIREP REPORT)
  Locked Bag 747, Eagle Farm QLD 4009
  Australia

4. Coordination

4.1 If any centre has any questions or requires assistance to participate in this important AIREP survey please contact the AIREP team:

Mr. Aidan COOLEY Data Administrator Airservices Australia Locked Bag 747 Eagle Farm Brisbane QLD 4009 Tel: +61 (7) 38663762 Fax: +61 (7) 38663553 e-mail: aidan.cooley@airservicesaustralia.com	**Ms. CHUA Guat Mui** Supervisor, Main Meteorological Office Meteorological Services Division National Environment Agency Singapore Changi Airport P.O. Box 8 Singapore 918141 Tel: +65 65422861 Fax: +65 65425026 e-mail: chua_guat_mui@nea.gov.sg

Appendices:

Appendix A – QUESTIONNAIRE – GENERAL INFORMATION ON AIREP
Appendix B – Information on AIREP bulletin exchange by the ROBEX centres
Appendix C – Sample AIREP Bulletins

APPENDIX A
QUESTIONNAIRE – GENERAL INFORMATION ON AIREP

(*Place X in box where applicable*)

The purpose of this questionnaire is:

1) to acquire basic information on the State's procedures regarding the AIREP exchange ; and
2) to collect views for future development of the regional procedures for AIREP exchange.

DEFINITION: The term AIREP Exchange is used here to cover the collection, dissemination and exchange of routine and special air-reports as described in Annex 3, Chapter 5, *Aircraft Observations and Reports*.

Q1. State: _____

1.1 Name and address of the administration unit to which AIREP exchange related issues should be addressed

_____

_____

_____

Note: Collection and dissemination of AIREP requires cooperation between the ATS units and the Meteorological Watch Offices (MWO). If necessary, list both administrations that may be concerned with AIREP.

Q2. Is/are the Meteorological Watch Office/s (MWO) in your State tasked to collect air-reports as per Annex 3, Chapter 5? Yes_____No_____

Q3. Describe in brief the procedures in place for relaying air-reports by the ATS unit(s) to the associated MWO(s):

_____

_____

_____

Q4. Describe in brief the procedures used by MWO(s) for handling air-reports, in particular:

A) coding procedures:

_____

_____

B) AIREP bulletin preparation:

_____

_____

C) transmission of AIREP bulletins to WAFCs:

_____

_____

D) transmission of AIREP bulletins to responsible ROBEX centre:

_____

_____

E) procedures for handling special air-reports (ARS):

_____

_____

Q5. Comments and/or requirements on future development of the regional procedures for AIREP exchange:

_____

_____

_____

_____

_____

_____

Please return completed questionnaire to ICAO Asia and Pacific Office by ……..
(e-mail: icao_apac@bangkok.icao.int / facsimile: +66 (2) 537 8199)

— — — — — — — —

APPENDIX B

INFORMATION ON AIREP BULLETIN EXCHANGE BY THE ROBEX CENTRES

ROBEX Centre Name_____

Name of the administration unit to which AIREP related issued should be addressed _____

Name of a contact person _____
Tel:_____
Fax:_____
E-mail Address:_____

Form for Recording AIREP Information Received or Collected by the Centre						
Date (YYMMDD)	**Number of Bulletins received**	UA AIREP Bulletin Headers **(TTAAii CCCC)**	**Originator of Bulletin (AFTN address)**	**Number of AIREP messages in the bulletin (if available)**	**Any Special Air-Reports (ARS) generated; type of ARS (volcanic activity etc.)**	**Remarks or comments. Correctness of the bulletin/message format in accordance with ICAO Annex 3**

Form for Recording AIREP Information Compiled and Generated by the Centre						
Date (YYMMDD)	**Number of Bulletins Generated**	**UA AIREP Bulletin Headers (TTAAii CCCC)**	**AFTN address/s used to distribute the bulletin, including WAFC address/s if used**	**Number of AIREP messages in the bulletin (if available)**	**Any Special Air-Reports (ARS) generated; type of ARS (volcanic activity etc.)**	**Remarks or comments. Correctness of the bulletin/message format in accordance with ICAO Annex 3**

— — — — — — — —

APPENDIX C

Sample AIREP Bulletins

Some examples of AIREP (UA) bulletins as currently exchanged under the ROBEX scheme are provided below:

301840 VCCCYPYX
UASB31 VCCC 301840
CPA748 KADAP1817 FL370 T MS48 SPOT 085/35=
(Above bulletin contain 1 ARP but is not in the correct Annex 3 format – Positions should be reported as Latitude/Longitude)

210014 RJAAYPYX
UAFE31 RJTD 210000
JAL601 4144N 14813E 2312 F340 MS39 280/65=
JAL640 4144N 14813E 2322 F320 MS33 270/65=
FDX87 4900N 16001E 2321 F380 MS55 320/47=
NWA907 4223N 14729E 2328 F360 MS47 265/60=
NCA103 4223N 14729E 2330 F370 MS47 275/55=
FDX79 4144N 14813E 2341 F340 MS40 280/60=
JAL606 4144N 14813E 0002 F360 MS44 280/65=
NWA78 2100N 14259E 0006 F360 MS46 050/37KT=
NWA912 2835N 13349E 0011 F290 MS25 230/15KT=
(Above bulletin contain 9 ARP and is in the correct Annex 3 format - Positions reported as Latitude/Longitude)

290355 VHHHYPYX
UAHK31 VHHH 290300
CAL652 1702N 11341E 0326 F320 MS37 190/12KT=
CAL652 1814N 11433E 0337 F320 MS36 180/06KT=
(Above bulletin contain 2 ARP and is in the correct Annex 3 format - Positions reported as Latitude/Longitude)

302350 YBBBZEZX
UAAU31 YBBN 302350
VHFNY KAGUX 2256 F350 ROSEY 2322 MS47 245/65=
ANZ123 MIKEL 2325 F360 GEMAC 0012 MS60 193/44=
PAO855 OLREL 2250 F380 MAGDA 2343 180/68 MS66=
PBI42 PLUGA 2320 F390 SASRO 0020 MS66 160/40=
ANZ123 SASRO 2249 F360 MIKEL 2325 MS60 188/80=
(Above bulletin contain 5 ARP but is not in the correct Annex 3 format - Positions should be reported as Latitude/Longitude)

— END —

PART VI
METEOROLOGY (MET)

…

6. SIGMET and AIRMET information
(FASID Tables MET 3A and MET 3B)

6.1 The period of validity of SIGMET messages should not exceed 4 hours. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, the validity period may be extended up to 6 hours and an outlook should be added giving information for an additional period of up to 12 hours concerning the trajectory of the volcanic ash cloud and positions of the centre of the tropical cyclone respectively.
~~[ASIA/PAC/3 Rec. 8/16]~~
[IAVWOPSG/1 Conclusion 1/1]

...

6.3 In order to assist MWOs in the preparation of the outlook included in SIGMET messages for volcanic ash, Volcanic Ash Advisory Centres Anchorage, Darwin, Tokyo, Washington and Wellington have been designated to prepare the required advisory information and send it to MWOs concerned in the Asia and Pacific Regions following notification/detection of the ash cloud. FASID Table MET 3B sets out the areas of responsibility of the volcanic ash advisory centres and the MWOs and ACCs to which the advisory information should be sent.
~~[ASIA/PAC/3 Rec. 8/9, Rec. 8/16]~~
~~[APANPIRG/4 Concl. 4/36]~~
[IAVWOPSG/1 Conclusion 1/1]

6.4 In order for ~~volcanic ash advisory centres~~ the VAACs to initiate the monitoring of volcanic ash from satellite data and the forecast of volcanic ash trajectories, MWOs should notify the relevant volcanic ash advisory centre immediately on receipt of information that a volcanic eruption has occurred or volcanic ash has been observed in the FIR for which they are responsible. In particular, any special air-reports of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud, received by MWOs should be transmitted without delay to the VAAC concerned.
~~[ASIA/PAC/3 Rec. 8/16]~~
[IAVWOPSG/1 Conclusion 1/1]

...

— — — — — — — —

ASIA/PAC FASID **6-0-1**

PART VI

METEOROLOGY (MET)

...

5. VOLCANIC ASH ADVISORY CENTRES (FASID Table MET 3B, FASID Chart MET 3)

5.1 The areas of responsibility of the designated Volcanic Ash Advisory Centres (VAACs) Anchorage, Darwin, Tokyo, Washington and Wellington, and the MWOs to which the advisory information should be sent by the Centres VAACs are contained in FASID Table MET 3B. The areas of responsibility of the designated VAACs in all regions are shown on FASID Chart MET 3.

Note 1. — Operational procedures to be used for the dissemination of information on volcanic eruptions and associated ash clouds in areas which could effect routes used by international flights and necessary pre-eruption arrangements as well as the list of operational contact points are provided in the document entitled Handbook on the International Airways Volcano Watch (IAVW) - Operational Procedures and Contact List *(Doc 9766). This Handbook is published by ICAO. The Handbook is available on the ICAO web site: http://www.icao.int/cgi/goto_anb.pl?met and "click" on "International Airways Volcano Watch".*

Note 2. — The Additional information in particular on the problem of volcanic ash and the guidance regarding what each of the parties in the IAVW is expected to do and why, are contained in the Manual on Volcanic Ash, radioactive materials and toxic clouds *(Doc 9691). This document is prepared by ICAO Secretariat with assistance of the Volcanic Ash Warning Study Group (VAWSG).*

Note 3. —"Volcanic Ash and Aircraft Operations ASIA/ PAC Regional Handbook" *addresses the danger of airborne volcanic ash, procedures for notifying ash occurrences and provides assistance to pilots in avoiding actual ash encounters. The Handbook has been published as a single volume reference for both ground and air crews to assist coordination between the two in the event of an encounter with volcanic ash. The Handbook is published by the ICAO Asia and Pacific Office, Bangkok.*

...

FASID Table MET 3B
VOLCANIC ASH ADVISORY CENTRES

EXPLANATION OF THE TABLE

Column

1 Location of the volcanic ash advisory centre (VAAC).

2 Area of responsibility for the preparation of advisory information on volcanic ash by the VAAC in Column 1.

3 MWOs to which the advisory information on volcanic ash should be sent.

4 ACC to which the advisory information on volcanic ash should be sent.

5 ICAO location indicator assigned to the ACC in Column 4.

Note. — ICAO location indicators for MWOs are shown in FASID Table MET 1B.

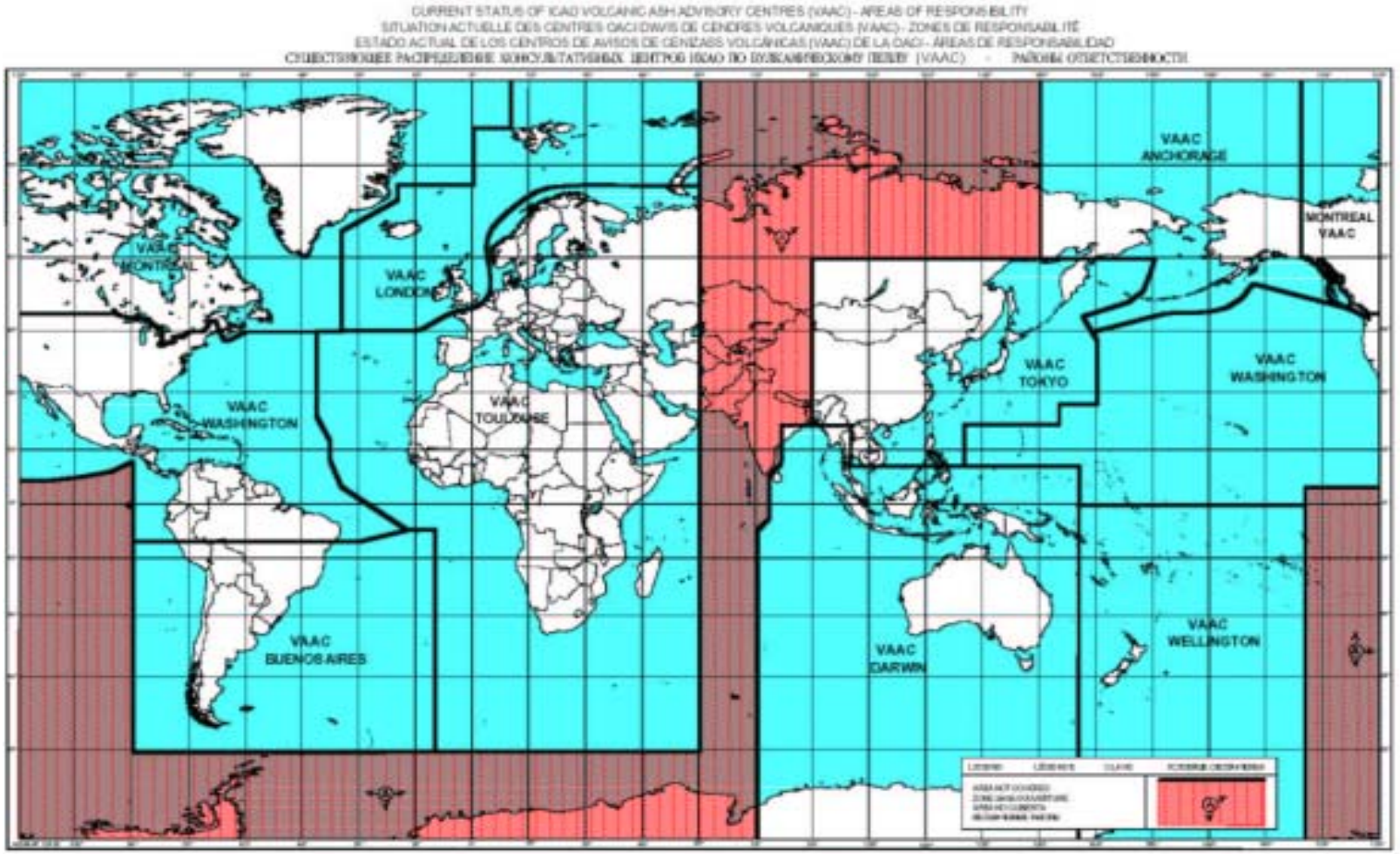
Volcanic ash advisory centre	Area ofresponsibility	MWO to which advisory information is to be sent	ACC to which advisory information is to be sent	
1	2	3	Name	ICAO loc. Ind.
			4	5
Anchorage (United States)	Anchorage Oceanic Anchorage Continental Anchorage Arctic and west to E150, north of N60	Anadyr Anchorage Chaybukha Chersky Chokurdakh Kelowna Mys Shmidta Pevek Seymchan Provideniya Bay Tilichiki Tiksi Tokyo Zyryanka	Anadyr Anchorage Boston Chaybukha Chersky Chicago Chokurdakh Cleveland Denver Fairbanks Minneapolis Mys Shmidta New York Pevek Salt Lake Seattle Seymchan Tiksi Tokyo Washington Zyryanka	UHMA PAZA KZBW UHMG UESS KZAU UESO KZOB KZDV PAFA KZMP UHMI KZNY UHMP KZLC KZSE UHMS UEST RJTI KCFC UESU
Darwin (Australia)	Southward from N10 and from E100 to E160, and the Perth FIR between E100 and E75, Colombo FIR, and those parts of the Kuala Lumpur, Bangkok, Chennai, Yangon and Calcutta FIRs lying within N10 E100 to N20 E100 to N20 E82 to N10 E82 to N6 E78 to S2 E78 to E6 E75	Adelaide Bangkok Biak Brisbane Chennai Darwin Denpasar Gia Lam Guam Hobart Honiara Jakarta Kota Kinabalu Kuala Lumpur Manila Melbourne Perth Port Moresby Singapore Sydney Townsville Ujung Pandang Yangon	Adelaide Bali Bangkok Brisbane Cairns Chennai Darwin Ho-Chi-Minh Honiara Jakarta Kota Kinabalu Kuala Lumpur Manila Medan Melbourne Perth Port Moresby Singapore Sydney Townsville Ujung Pandang Washington	FAAD WRRZ VTBB YBBN YBCS VOMF YPDN VVTS AGGH WIIZ WBKK WMFC RPHI WIMZ YMMM YPPH AYPM WSJC YSSY YBTL WAAZ KCFC
Tokyo (Japan)	N60 to N10 – and from E90 to Oakland Oceanic and Anchorage Oceanic and Continental FIR boundaries	Bangkok Blagobeschenk Beijing Bratsk Chita Gia Lam Guangzhou Hong Kong Irkutsk Khabarovsk Kirensk Kunming Lanzhou	Bangkok Blagoveschenk Beijing Bratsk Changsha Chengdu Chongqing Chita Daegu Dalian Fukuoka Guangzhou Guilin Haikou	VTBB UHBB ZBPE UIBB ZGCS ZUDS ZUCK UIAA RKTT ZYTL RJDG ZGZU ZGKL ZJHK

Volcanic ash advisory centre	Area ofresponsibility	MWO to which advisory information is to be sent	ACC to which advisory information is to be sent	
1	2	3	Name	ICAO loc. Ind.
			4	5
		Magadan Magdagachi Manila Naha Nikolayevsk- na-Amure Okha Okhotsk Petropavlovsk- Kamchatsky Phnom-Penh Pyongyang Seoul Shanghai Shenyang Taibei Tokyo Ulan-Bator Urumqi Vientiane Vladivostok Wuhan Yuznosakhalinsk	Hanoi Harbin Hefei Ho-Chi-Minh Hong Kong Huhhot Irkutsk Jinan Khabarovsk Kirensk Kunming Lanzhou Manila Magadan Magdagachi Naha Nanchang Nanjing Nanning Nikolayevsk- na-Amure Okha Okhotsk Osaka Petropavlovsk- Kamchatsky Phnom-Penh Pyongyang Qingdao Sanya Shanghai Shenyang Taibei Taiyuan Tokyo Ulan-Bator Urumqi Vladivostok Washington Wuhan Xiamen Xi'an Yuzno-Sakhalinsk	 ZYHB ZSOF VVTS VHHH ZBHH UIII JSTN UHHH UIKK ZPKM ZLAN RPHI UHMM UHBI ROAH ZSCN ZSNJ ZGNN UHNN UHSH UHOO RJOO UHPP VDPP ZKKK RCMQ ZJSA ZSHA ZYSH RCTP ZBYN RJTI ZMUB ZWWW UHWW KZDC ZHWH ZSAM ZLSN UHSS

Volcanic ash advisory centre	Area ofresponsibility	MWO to which advisory information is to be sent	ACC to which advisory information is to be sent	
1	2	3	Name	ICAO loc. Ind.
			4	5
Washington (United States)	New York Oceanic Oakland Oceanic and United States Continental FIRs, CAR Region, SAM Region north of S10	Belem Bogotá Caracas Cayenne Darwin Gander Georgetown Guam Guayaquil Habana Honolulu Kansas City Kingston Lima-Callao Manaus Mexico Nassau Panama Port-au-Prince Port of Spain Recife San Francisco San Juan, Puerto Rico Santo Domingo Tegucigalpa Tokyo Willemstad Zandery	Albuquerque Atlanta Barranquilla Belem Bogotá Boston Chicago Cleveland Curaçao Denver Fort Worth Georgetown Guayaquil Habana Honolulu Houston Indianapolis Jacksonville Kansas City Kingston Lima Los Angeles Maiquetia Manaus Mazatlán Menphis Mérida México Minneapolis Monterrey Nassau New York Oakland Panamá Paramaribo Piarco Port-au-Prince Porto Velho Recife Rochambeau Salt Lake City San Juan, Puerto Rico Santo Domingo Seattle Tegucigalpa Washington	KZAB KZTL SKEC SBBL SKED KZBW KZAU KZOB TNCF KZDV KZFW SYGC SEGU MUFH PHZH KZHU KZID KZJX KZKC MKJK SPIM SPLI SVZM SBMU MMZT MMMZ MMID MMEX KZMP MMTY MYNA KZNY KZOA MPZL SMPM TTPP MTEG SBPH SBRE SOOO KZLC TJZS MDSD KZSE MHTG KCFC
Wellington[1] (New Zealand)	Southward from the Equator and from E160 to W140	Darwin Fiji Honiara Honolulu Nauru Tahiti Wellington	Auckland Brisbane Christchurch Darwin Honolulu Nadi Tahiti Washington	NZAA YBBB NZZC YPDN PHZH NFFF NTAA KZDC

[1]New Zealand is currently providing the advisory service from the equator up to S60.

FASID CHART MET 3



SUMMARY
of the outcome of
ASIA/PAC Special Implementation Project
on Volcanic Ash SIGMET – 2003

1. Introduction

1.1 The ASIA/PAC SIP on volcanic ash (VA) SIGMET was conducted in two stages. During the first stage held between April and September 2003, three States in the area of responsibility of VAAC Tokyo were visited: Japan, the Philippines and the Russian Federation. The second stage, which covered parts of the area of responsibility of VAAC Darwin, was held in November and December 2003 and included visits to Indonesia and Papua New Guinea, as well as a short coordination meeting with the Bureau of Meteorology, Australia.

1.2 The outcome of the SIP is in the form of five State mission reports containing a number of recommended actions, aimed at improving the implementation of the ICAO IAVW provisions in the MET, ATS and AIS fields. A final report summarizing these recommendations is under preparation and will be disseminated to all States in the ASIA/PAC Region concerned with volcanic ash.

1.3 A summary of the findings and recommendations made by the SIP missions to States is provided in the following paragraphs.

2. Improvement of the institutional arrangements

2.1 In most of the States visited the coordination between the MWOs, the associated ACCs, and the institutions providing volcanological observations was not satisfactory. As a result, the information for volcanic eruptions was absent, delayed or not addressed properly, which resulted in non-issuance of SIGMET and delays in relaying this information to the VAACs. It was recommended that the three parties involved in the IAVW in the States should draw up letters formal Letter of Agreement, as recommended by p. 4.1.3 of the Handbook on IAVW, Doc 9766. In order top assist the States in this matter it was proposed to IAVWOPSG that a sample Letter of Agreement is included in the Handbook on IAVW, Doc 9766. IAVWOPSG/1 meeting formulated Conclusion 1/3 in this regard.

2.2 As part of the institutional arrangements, the following issues should be addressed by the States as a matter of urgency:

- Provision of 24-hour availability of volcanological advice (currently not available in 4 of the States visited);
- Inclusion of information on volcanoes in the States' AIPs (currently not available in most of the States visited);
- Development of ATM contingency arrangements in case of volcanic ash in the FIRs (formal arrangements were not available in most of the States visited);
- Improvement of NOTAM/ASHTAM issuance.

3. Compliance with the ICAO format of SIGMET and related procedures

3.1 A common problem in all States visited was the non-compliance of the format of the SIGMET messages with the standard format spelled out in Annex 3. The following are some examples:

- Wrong WMO data type identifier (WS used instead of WV);
- Lack of outlook part;
- Copying the advisory message in full as SIGMET;
- Use of volcanic activity report format in SIGMET;
- Non-standard coding of geographical information; etc.

3.2 Detailed guidance on the correct format of SIGMET messages was provided in the new edition of the ASIA/PAC Regional SIGMET Guide, which was published in September 2003. All States were advised to aligne their SIGMET practices with the guidance provided in this publication.

3.3 States were also advised on the proper use of the ICAO communication system in order to ensure the dissemination of SIGMET to all users concerned, as well as, their dissemination via SADIS and ISCS.

4. On-site assistance and feed-back from the States

4.1 In order to assist the States in improving the SIGMET-related formats and procedures, ICAO conducted during the SIP missions one-day seminars with representatives from MET, ATS and volcanoloigical agencies. At these seminars ICAO presented the IAVW procedures with an emphasize on the issuance and dissemination of volcanic ash SIGMET. The seminars provided very useful feed-back from the States regarding the difficulties in implementing IAVW provision. Some of the most important issues raised are as follows:

4.1.1 Clearer instructions regarding the information flow between volcanological agencies, ACCs, MWOs, and VAACs were requested.

4.1.2 Some MWOs faced difficulties in interpreting the VA advisories. For instance:

- The description of the VA cloud in some advisories from VAAC Tokyo were too lengthy (too many points used), which made their decoding time-consuming and prone to errors;
- A large number of VA advisory issued by the VAACs did not contain forecast information needed for the outlook of SIGMET; MWOs were not clear how to proceed with the SIGMET issuance in such cases;
- Further guidance was also requested regarding the appropriate description of VA clouds that may cross the FIR boundaries.

4.1.3 Some States reported serious difficulties in obtaining the initial information about volcanic activity/eruptions from their volcano observatories due to infrastructural problems. For instance, frequent blackouts in Rabaul observatory, Papua New Guinea were the main reason for irregular provision of volcanic activity information to Port Moresby MWO and ACC.

5. Conclusions

5.1 The ASIA/PAC SIP on volcanic ash SIGMET conducted in 2003 helped in identifying the problems related to the issuance of SIGMET by the MWOs in the States with active volcanoes. ICAO provided on-site assistance, including some short training, and formulated specific recommendations to be followed by the States visited in order to solve the identified deficiencies. The feed-back received from the States will be very helpful in improving the provisions related to volcanic ash SIGMET.

— — — — — — — —

Results of the ASIA/PAC Survey on the use of tropical cyclone advisories and issuance of tropical cyclone SIGMET

Presented by the Rapporteur of the Volcanic Ash/Tropical Cyclone Implementation Task Force (VA/TC Implementation TF)

1.1 The ICAO APAC Office sent the questionnaire, shown in Attachmen 1, to all Contracting States/Territories on 25 March 2004. By the end of June 2004, 18 responses were received. Among the returned questionnaire, one is from State without a MWO, four are from those with a TCAC.

1.2 The survey results are presented in tables in Attachment 2.

(a) The number of TCs affecting the area of responsibility:
Most of the States are affected by one to five TCs a year.

(b) Whether TC SIGMETs are issued for all TCs affecting the area of responsibility:
Most of the States answered that they issue TC SIGMETs for all TCs affecting their area of responsibility.

(c) The source of issuing TC SIGMETs:
Approximately half of the States answered that their TC SIGMETs depend on TCAs, while the others use other information.

(d) The satisfaction level of TCAs:
Most of the answers show their satisfaction level is “good”.

(e) Some outstanding comments:
- MWOs have to interpolate 6 hour forecast from TCAs.
- All the SIGMETs concerning TC should have the same format so that computers can easily process them.
- Information related to TCA (Tokyo) is generally reliable.
- TCAs should be communicated electronically to all member countries.
- The very erratic behavior of TCs in the SW Pacific requires more frequent updates of TC advisories and warnings.
- We need VSAT for WAFS grid data and SIGMETs, VA/TC information.
- We suggest TC advisories and warnings be issued every 3 hours.
- TCAs are not orderly received at VCBI.
- TCAs could cover TC-SIGMET role. SIGMETs for TS around a TC might replace TC-SIGMET.

Attachment A

QUESTIONNAIRE

Asia/ Pacific Regional survey on the status of implementation of
Tropical Cyclone Advisories and SIGMETs issuance
(*Place X in box where applicable*)

The purpose of this questionnaire is:
1) to acquire basic information on MWOs that issue SIGMETs for tropical cyclones (TC) ; and
2) to collect views for future development of international system of TC advisories and warnings.

Q1. State: _____

1.1 Name of the administration unit to which SIGMET related issues should be addressed

_____

1.2 Name and address of a contact person regarding SIGMETs

Name _____

Mail Address: _____

Tel: _____

Fax: _____

E-mail Address: _____

Q2. Name, ICAO location indicator (CCCC) and AFTN address of the Meteorological Watch Office(s) (MWO) responsible for issuing SIGMET for tropical cyclones (TC-SIGMET).

Name:_____ CCCC:_____ AFTN:_____

Name:_____ CCCC:_____ AFTN:_____

Note: Add additional lines if necessary

Q3. How many TCs a year is your area of responsibility (AoR) affected by?

___Never ___less than 1 ___1 to 5 ___5 to 10 ___more than 10

****If you chose Never to Q3, please skip to Q7****

Q4. TC-SIGMETs are issued:

___Never ___For all TCs affecting AR ___Depending on the significance

Q5. TC-SIGMETs are based on:

___Tropical Cyclone Advisories(TCAs) (specify the name of TCAC _____)

___Other than TCAs (specify the information source _____)

Q6. Please choose the level of satisfaction with TCAs

6.1 Timing

___very good __good ___fair ___ poor __very poor

6.2 Reliability of present information of TCs

___very good __good ___fair ___ poor __very poor

6.3 Reliability of forecast information of TCs

___very good __good ___fair ___ poor __very poor

6.4 Comments on current TCAs (including the reason if you chose "poor" in the previous questions).

_____

_____

_____

_____

_____

Q7. Comments and/or requirements on future development of the system of international TC advisories and warnings.

_____

_____

_____

_____

_____

Please return completed questionnaire to ICAO Asia and Pacific Office by 14 May 2004
(e-mail: icao_apac@bangkok.icao.int / facsimile: +66 (2) 537 8199)

— — — — — — — —

Attachment B

Statistics of the answers to the survey on TC SIGMETs

Q3. How many TCs a year is your area of responsibility (AoR) affected by?

Never	less than 1	1 to 5	5 to 10	More than 10
1	**1**	**11**	**3**	**2**

Q4. TC-SIGMETs are issued:

Never	For all TCs affecting AR	Depending on the significance
1	**15**	**1**

Q5. TC-SIGMETs are based on:

TCAs	Others	Both
7	**9**	**1**

Q6. Please choose the level of satisfaction with TCAs

6.1 Timing

Very good	Good	Fair	Poor	Very poor
5	**8**	**3**	**0**	**0**

6.2 Reliability of present information of TCs

Very good	Good	Fair	Poor	Very poor
5	**9**	**2**	**0**	**0**

6.3 Reliability of forecast information of TCs

Very good	Good	Fair	Poor	Very poor
5	**7**	**4**	**0**	**0**

Note: Three of “Very good” are from TCAC provider states.

— — — — — — — —

Amendment Proposal for TC Advisory Format

IATA Proposal for amendmenr of Tropical Cyclone Advisory format

The proposal for amendments to the TC Advisory format in ICAO Annex 3 is provided below. IATA expects that these changes will improve the reliability of the TC advisory and the message processing. The proposed text for deletion is given in ~~strikthrough~~ and proposed new text is in **bold** letters.

DRAFT FORMAT OF TC ADVISORY ACCORDING TO ICAO Annex 3

1.	TC ADVISORY	
2.	DTG:	Year, month, date (yyyymmdd)/time (in UTC) (using "Z") of issue
3.	TCAC:	Name of TCAC (location indicator or full name)
4.	TC:	Name of tropical cyclone **or "UNNAMED“**
4a	**TC STS:**	**Status of TC at the time of issuance of the advisory** **TD – Tropical Depression** **TS – Tropical Storm** **STS – Severe Tropical Storm** **TC – Tropical Cyclone**
5.	NR:	Advisory number (starting with **"1“**, "01" or **"001"** for each cyclone)
6.	PSN:	Position of the centre in degrees and minutes ("Nnnnn" or "Snnnn", "Wnnnn" or "Ennnn")
7.	MOV:	Direction **~~and speed~~** of movement **~~respectively~~** to at least eight compass points ("N", "NE", "E", "SE", "S", "SW", "W", "NW") **~~and in km/h (or kt)~~** **Speed of movement in km/h (or kt) or SLW (< 5kt) or STNR**
8.	C:	Central pressure (in hPa)
8a	**DIA HIGH WIND:**	**Diameter of strong winds <criterion> area in NM**
8b	**TOPS FRQ CB:**	**Height of TOPS of frequent CB in hundreds of feet**
8c	**DIA FRQ CB:**	**Diameter of frequent CB area in NM**
9.	MAX WIND:	Maximum surface wind near the centre (mean over 10 minutes, in km/h (or kt))
10.	FCST PSN + 12 HR:	Forecast of centre position for fixed valid time of .... UTC (12 hours after time of issuance of the advisory)
11.	FCST MAX WIND + 12 HR	Forecast of maximum surface wind near the centre for fixed valid time of .... UTC (12 hours after time of issuance of the advisory)
12.	FCST PNS + 18 HR:	Forecast of centre position for fixed valid time of .... UTC (18 hours after the issuance of the advisory)

13.	FCST MAX WIND + 18 HR:	Forecast of maximum surface wind near the centre for fixed valid time of .... UTC (18 hours after the issuance of the advisory)
14.	FCST PSN + 24 HR:	Forecast of centre position for fixed valid time of .... UTC (24 hours after issuance of the advisory)
15.	FCST MAX WIND + 24 HR:	Forecast of maximum surface wind near the centre for fixed valid time of .... UTC (24 hours after the issuance of the advisory)
16.	NXT MSG:	Expected year month date (yyyymmdd)/time (in UTC) (using "Z") of issuance of next advisory (using "BFR", if applicable) or "NO MSG EXP"
16a	**RMK:**	**Additional Information**

— — — — — — — —

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

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
1	ATN Implementation	Implementation of Ground-to-Ground element of ATN is required.	2005	CNS/MET ATN Transition Task Force	***Implementation plan to be completed and Implementation to commence in 2005***
2	Incorporation of CNS/ATM Material into Regional ANP & FASID	Incorporation of CNS/ATM Material into Regional ANP & FASID	APANPIRG/13	ATS/AIS/SAR	On-going
3	WGS-84 Implementation	To achieve uniformity in aeronautical data publication across the Region in order to ensure a standard reference system for CNS/ATM.	Immediate (Effective Date was 1 Jan 1998)	ATS/AIS/SAR	Implementation is monitored at each meeting using the uniform format for the reporting of WGS-84 implementation. Report progress to APANPIRG/14
4	RVSM Implementation	To provide more efficient flight profiles and to increase airspace capacity in conjunction with the implementation of CNS/ATM.	Bay of Bengal – 27 November 2003	ATS/AIS/SAR	

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
5	RNP Implementation En-route RNP 10 & 4 Terminal RNP 4& 1 Approach RNP 0.3	*Implement RNP based navigation, operation and procedures to improve the efficiency and flexible use of airspace.*	On Going Report to APANPIRG	ATS/AIS/SAR & CNS/ATM/IC	Phased implementation.
6	ADS-C	The implementation of ADS in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM.	APANPIRG	ATS/AIS/SAR	-Phased implementation. Revised Regional CNS/ATM Guidance Material developed containing ADS section. -Implementation focus and timetable need to be developed. -States are gaining experience in the use of ADS.
7	Technical Co-operation in Regional CNS/ATM Planning & Implementation	The continuation and enhancement of ICAO's co-ordinating role of technical co-operation in CNS/ATM planning and implementation, in close co-operation with all partners and taking into account the regional approach, is required.	APANPIRG/14	All	Sub-groups to identify requirements.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
8	Preparation for WRC-2007	The co-operative participation of States is required with their respective telecommunications regulatory authorities, regional groups, at the APT forums and at the C regional preparatory meetings for WRC 2007to ensure that aviation spectrum requirements are fulfilled and protected.	WRC-2007	All	States are designating contact points responsible for preparation of WRC 2007 and are providing contact details for posting in the website to facilitate coordination.
9	GNSS Implementation • ABAS • SBAS • GBAS	To implement GNSS in accordance with the Asia Pacific Regional Strategy. Develop regional GNSS Augmentation requirements Ensure region wide awareness of developing GNSS systems integrate into Regional Plan.	On Going. Report to APANPIRG	All	SBAS – WAAS IOC announced on 10 July 2003 SBAS receiver - TSO C145/6 receivers now available GBAS – FAA LAAS contract for delivery in ***2009***
10	ATS route implementation	To review and develop new requirements for ATS routes.	APANPIRG/15	ATS/AIS/SAR	2004

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
11	Final phase of WAFS	To implement transition to the final phase of WAFS to support the CNS/ATM system.	2004	CNS/MET SG	• WAFS Transition Plan and Procedures has been developed and is being successfully implemented. • Transfer of responsibility of RAFCs to WAFCs London and Washington has been implemented. • Closure of RAFCs has been implemented.
12	MET Chapter 8 of the ASIA/PAC Regional Plan for New CNS/ATM System	To develop MET components of the ASIA/PAC CNS/ATM concept/strategy To develop MET Chapter of the Regional CNS/ATM Plan	2003 2004	CNS/MET SG with assistance of the ATS/AIS/SAR SG METATM TF	• The first draft of MET Chapter of the Regional CNS/ATM Plan has been developed. • METATM TF to develop MET components of the ASIA/PAC CNS/ATM concept/strategy.
13	Data – link Communications	Implementation of CPDLC. AIDC to be introduced where ATS automated systems are implemented.	On -going 2005	All All	Sub – Groups to review progress of implementation. Implementation focus and time table need to be developed.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
14	ADS-B	Data Link Selection for ADS/B recommended by ADS-B Task Force <u>Target date of Implementation:</u> States, where appropriate, implement " ***ADS-B Air-Ground surveillance service*** on a sub-regional basis. ADS-B Task Force to develop implementation plan and sub-groups foster implementation.	2003 2006 ***2005***	CNS/MET ***ADS-B Task Force*** All ***ADS-B Task Force***	APANPIRG/14 adopted 1090 MHz ES as the data link for ADS-B in ASIA/PAC region.
15	Implementation of APV and RNP Approaches	Review applicability of APV and RNP Approach Design Standards for Asia Pacific. Develop implementation strategy.	On Going. Report to APANPIRG	ATS/AIS/SAR	APV and RNP Design standards now in PANS OPS. Aircraft certified for RNP and APV approaches.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
16	Data Link Flight Information Services (DFIS) applications	To implement the following applications via request/response mode of data link in the Asia and Pacific Regions: a) Data link –automatic terminal information services (D-ATIS); b) VOLMET data link service (D-VOLMET); c) Pre-Departure Clearance (PDC) delivery via data-link;	2008	All	Trials and demonstrations are conducted and some operational services are provided by States; D-VOLMET to be implemented by VOLMET Broadcast Stations specified in the FASID.
17	Safety Management Systems	States to establish national safety management systems and effective application of safety programmes which are required for the provision of air traffic services.	APANPIRG/14	CNS/ATM/IC RASMA/SG (Subject to APANPIRG/14)	Annex 11 provision effective 27 November 2003.

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
AUSTRALIA	ATN tests were conducted. BIS Router and Backbone BIS Router and AMHS will be implemented by 2006.	AFTN based AIDC Implemented between Brisbane and Auckland.	Implemented and integrated with ATM systems to support FANS1/A equipped aircraft.	Implemented (S) 360 -370 GPS NPA Final 26 aerodromes completed 2004.	Developed en-route as (P) for approval to use in domestic airspace.	ADS-B trial being conducted. 27 ground stations are expected operational end of 2005 for upper air space which not cover by radar.	FANS 1/A ADS-C implemented.	
BANGLADESH	BIS Router and AMHS planned for 2005							
BHUTAN	ATN BIS Router and UA service 2008			Procedures developed for NPA as (S)				
BRUNEI DARUSSALAM	ATN BIS Router and AMSH planned 2006							
CAMBODIA	BIS Router and AMHS planned for 2005							
CHINA	ATN BIS Router AND AMHS will be implemented in 2005 and 2006.	AIDC between ACCs within China are being implemented.	Implemented to support ATS Route L888 and polar routes. Trial on HF data link conducted for use in western China.		Implemented in certain airspace as (S).	ADS-B trial will be conducted in 2004	FANS 1/A ADS-C implemented to support L888 and polar routes.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
HONG KONG, CHINA	- Tripartite BBIS trial with Beijing and Bangkok completed in Jan 2003; -64 Kbps ATN Link with Bangkok put into operational use in June 2004. -ATN trials with China and Japan conducted in 2003/04; -AMHS trials with China and Japan planned in 2004. Implementation of AMHS with Japan in 2005. - ATN/AMHS trials with Viet Nam, Philippines, Macao China planned in late 2004/2005.	Trial on the AFTN based AIDC with Guangzhou and Sanya, China commenced. Implementation planned for 2005.	FANS 1/A based CPDLC conducted. D-ATIS D-VOLMET and PDC implemented. VDL Mode-2 technical trial completed in Dec. 2002 and planning on further trials was in progress.	Pilot Programme on RNAV (GPS) departure procedures will be conducted in 2004.	Implemented in certain airspace as (S).	ADS-B trial using "ASMGCS" trial system in 2004/2005.	FANS 1/A Trials for ADS-C conducted.	
MACAO, CHINA	ATN BIS router and AMHS planned for 2nd half of 2005. Planning for trial with China and Hong Kong, China going on							ATZ within Hong Kong and Guangzhou FIRs. In ATZ full VHF coverage exist. Radar coverage for monitoring purposes.
COOK ISLANDS								
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA								

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
FIJI	AMHS in-house trials planned for 2003. AMHS trials with USA in 2004. ATN BIS Router and AMHS will be implemented in 2005.	Implementation of AFTN based AIDC with Brisbane and Auckland in 2003.	FANS-1. Implemented since 1997.	NPA procedures for (S) completed in Dec. 2002.	Implemented as (S).	ADS-B trials planned for 2004. Implementation in 2005/2006.	ADS-C implemented in oceanic airspace using EUROCAT 2000 X.	
FRANCE French Polynesia Tahiti		Implementation of limited message sets with adjacent centres under discussion.	FANS-1. Implemented since 1996.				FANS 1/A ADS-C implemented since March 1999.	
INDIA	ATN BBIS router and AMHS planned for implemention at Mumbai in 2005 and 2006.		FANS-1 implemented at Kolkata and Chennai. Planned for Mumbai and Delhi.		SBAS (S). Planned for 2005.	Considering using ADS-B to reduce coverage holes and proposal for trial to be conducted at Chennai.	FANS 1/A ADS-C implemented at Kolkata and Chennai. Plan to implement in Delhi and Mumbai.	
INDONESIA	ATN BIS Router and AMHS planned for implementation in 2005 and 2006.	AFTN based AIDC planned for implementation between Brisbane and Jakarta in 2004.	FANS-1/A. CPDLC in Jakarta, Ujung Pandang FIRs planned for 2005.	Procedure to be completed in 2006 for NPA (S).		Planning ATS-B round stations at 5 locations in the eastern part of Indonesia as first stage of phase I.	FANS 1/A ADS-C trial conducted at Jakarta ACC in 2005.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
JAPAN	ATN BBIS already implemented. AMHS implementation between Japan and USA in 2004 and between Japan and Hong Kong planned for 2005.	AIDC based. AFTN procedure implemented with Oakland USA.	FANS1/A system Implemented in Tokyo FIR.				FANS 1/A. ADS-C implemented in Tokyo FIR.	
KIRIBATI								
LAO PDR	ATN BIS Router and AMHS planned for implementation with Bangkok in 2005.		FANS-1/A Planned for Bay of Bengal and South China Sea areas. Equipment is under test operation.		Implemented as (S).		FANS-1/A. ADS-C planned for Bay of Bengal and South China Sea areas. Equipment under test operation.	
MALAYSIA	ATN BIS Router and AMHS planned for 2005.		Planned for Bay of Bengal and South China Sea areas.	NPA (S) at KLIA planned for 2003.			FANS 1/A ADS-C planned for Bay of Bengal and South China Sea areas.	
MALDIVES	BIS Router/AMHS planned for implementation in 2005.	Planned for 2006.	FANS1/A planned for 2006.		Trials planned for 2005-2008. Implementation in 2008.	Trials planned for 2004-2006. Implementation in 2006.		
MARSHALL ISLANDS				NPA (S) implemented at Majuro Atoll.				

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
MICRONESIA FEDERATED STATES OF								
Chuuk				NPA(S) implemented				
Kosrae				NPA(S) implemented				
Pohnpei				NPA(S) implemented				
Yap				NPA(S) implemented				
MONGOLIA	ATN BIS Router and AMHS planned for 2005 and 2006. Trial with Bangkok conducted		Function available. Regular trials are conducted.	GPS procedures are being developed and implemented at 10 airports.	Implemented as (P).	ADS-B trial in progress implementation planned for 2006.	FANS 1/A ADS-C implemented since August 1998.	
MYANMAR	Trial for ATN BIS Router with Thailand planned for 2003. Test with China planned for 2005.		Implemented since August 1998				Implemented since August 1998	
NAURU								
NEPAL	BIS Router and AMHS planned for 2005.			Development of arrival procedure and NPA as (S) completed. Departure procedure is being developed.	Implemented as (S).			

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
NEW ZEALAND	BIS Router and AMHS implementation planned for 2006.	AFTN based AIDC implemented between New Zealand, Australia and USA. Tests with Fiji planned	FANS/1A. Implemented	42 NPA implemented presently.	will be implemented as required.	Trials planned 2005. National coverage starts 2008 to be completed by 2015.	FANS 1/A Implemented.	
PAKISTAN	Implementation of ATN considered for Phase II (2005-2010).	Implemented between Karachi and Lahore ACCs	Implementation planned from 2005-2010.	Arrival and departure NPA procedure as (s) are being developed.	Planned for 2005-2010.	Planned for 2005 – 2010.	Planned for 2005-2010	RADAR coverage provided in Karachi and Lahore FIRs.
PAPUA NEW GUINEA								
PHILIPPINES	ATN BIS Router planned for 2005. Implementation for AMHS in April 2007.		D-ATIS and CPDLC Planned for 2008.				FANS 1/A ADS-C planned for 2008.	
REPUBLIC OF KOREA	ATN BIS Router/AMHS planned for 2005-2010.	AFTN based AIDC implemented between Incheon ACC and Seoul APP.	PDC & D-ATIS implemented 2003.			Planned for 2005-2010	Trial for FANS 1/A ADS-C implemented since 2003.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
SINGAPORE	ATN BBIS Router trial with Hong Kong conducted between April and June 2003. Trial with Thailand planned for 2004. Planned for ATN and AMHS implementation in 2005		Implemented since 1997. Integrated in the ATC system in 1999. D-ATIS implemented since February 2000.	NPA (S) procedure developed. RNAV (SID/STAR) in 2005	Implemented (S).	Trial planned for 2006.	FANS 1/A ADS-C implemented since 1997. Integrated with ATC system in 1999.	
SRI LANKA	ATN BIS Router Planned for 2005. AMHS planned along with BIS in 2005.		CPDLC implemented since November 2000.	NPA (S) planned for 2005.			FANS 1 /A ADS-C implemented since November 2000.	GPS based domestic route structure being developed.
THAILAND	ATN G/G system implemented for domestic services. BBIS/BIS Routers already implemented. AMHS 2005.	ATN based AIDC Implemented in Domestic Sector.	FANS-1/A Implemented.		Implemented as (S).		FANS 1/A ADS-C Implemented.	
TONGA	Target date for AMHS in 2006			NPA planned for 2010		Trial planned for 2010		CPDLC and ADS-C is not considered for lower airspace
UNITED STATES								
Anchorage			FANS1/A based CPDLC implemented.	NPA(S) implemented	En-route (P) implemented	ADS-B trials continuing.	FANS/1-ADS-C 2005.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
Fairbanks				NPA(S) implemented		Trials continuing		
Oakland		AFTN based AIDC implemented. ATN AIDC planned for 2005.	FANS-1/A based CPDLC implemented.	NPA (S) implemented	En-route (P) implemented		FANS-1/A ADS-C planned for Dec. 2004.	
Salt Lake City (Network Centre)	AMHS implementation between Japan and USA scheduled for 2004. Acceptance testing completed. USA/China and USA/Fiji AMHS testing scheduled for 2004.	AFTN based AIDC implemented. ATN AIDC planned for 2005.						
VANUATU								
VIET NAM	ATN trials with Bangkok in July 2004. Implementation of ATN BIS Router planned for 2004 and AMHS in 2006.	ATN based AIDC planned in 2005.	Planned for 2005.	Planned for NPA (S) for 2004.	Implementation as (S) planned for 2004.		FANS 1/A ADS-C planned for 2005.	Most of air space in Hanoi and Ho-Chi-Minh FIRs covered by RADAR.

**SURVEY ON PILOT'S REQUIREMENT ON
UPLINKING OF METEOROLOGICAL INFORMATION**

1. SURVEY RESULTS

1.1 A total of 66 replies from pilots of 10 airlines were received. Here below are the results of the survey:

1.2 *Data link on-board*

1.2.1 Pilots were asked if the aircraft they fly are equipped with data link equipment such as ACARS and CPDLC. Results indicate that a great majority of aircraft the pilots fly are already 'data-link-capable' (ACARS: 95%, CPDLC: 77%).

1.3 *Existing meteorological information/products*

1.3.1 In respect of acceptability of existing meteorological information/products, most of the pilots who responded to this question considered existing information/products acceptable.

1.3.2 Comments from pilots regarding areas for improvement/development for the existing meteorological information/products are summarized as follows:

(i) Some pilots indicated a need for the use of plain language for runway weather observations, METAR/SPECI and TAF/Landing Forecast. They also indicated that these three types of information/products be updated only upon significant change, but more frequent update is required for TAF/Landing forecast at time of extreme weather conditions;

(ii) For windshear and turbulence alert, some pilots would like the alerts to specify whether they are based on PIREP or not and would like to know the probability of windshear;

(iii) For SIGMET, pilots indicated a need to receive them via data links. They also indicated that SIGMETs be updated upon significant change. For SIGMET on tropical cyclone, information on probability of maximum wind speed was considered helpful. For SIGMET on thunderstorm/hail, information on direction and speed of movement was requested;

(iv) In respect of Wind/Temp forecast, some pilots indicated a need for closer spacing of data between flight levels for high level (FL 260-630) to allow better assessment of choice of flight levels;

(v) Regarding SIGWX forecast, there was a request for all volcanic areas be overlaid. There is also a suggestion for presenting area of turbulence with probability of occurrence.

1.3.3 Regarding update frequencies, some pilots indicated that the existing information/products should be made available on request. Apart from 'on request', the most desirable update frequencies indicated by the pilots are shown in Table 1. Here, the most desirable update frequency refers to the range of frequencies which relatively more pilots preferred.

Table 1 List of meteorological information/products and the desirable update frequency (other than 'on request')

Meteorological information/products	**Most desirable update frequency**
Existing Meteorological information/products	
Runway weather observations (e.g. winds, RVR)	15-30 min
METAR/SPECI	15-30 min
TAF/Landing forecast	1-3 h
Windshear and turbulence alert	<=15 min
SIGMET on tropical cyclone	30 min – 1 h
SIGMET on volcanic ash	Diverse result: 30 min - 12 h
SIGMET on thunderstorm / hail	15-30 min
SIGMET on turbulence	<= 15 min
Wind/Temp forecast for high level (FL250-630)	3-6 h
Wind/Temp forecast for medium level (FL100-250)	3-6 h
Wind/Temp forecast for low level (FL100 and below)	3-6 h
SIGWX forecast for high level (FL250-630)	1-3 h
SIGWX forecast for medium level (FL100-250)	3-6 h
New meteorological information/products	
Satellite images	30 min – 1 h
Radar images	15-30 min
Graphical SIGMET on tropical cyclones and volcanic ash	30 min – 1 h
Graphical display of lightning location and/or precipitation	15 min – 30 min
Graphical display of vertical cross-section of en-route wind/temperature	1 –6 h
Surface analysis	6 h
Turbulence report chart	3 h
Graphical area forecast for clouds and weather	6 h
Graphical area forecast for turbulence, icing and freezing level	6 h

1.3.4 Generally speaking, the most desirable update frequencies for existing meteorological information are:

(i) 30 minutes or less for runway weather observations, METAR/SPECI, and windshear and turbulence alerts;

(ii) 1 to 3 hours for TAF/Landing Forecast;

(iii) 1 hour or less for SIGMET messages, except for SIGMET of volcanic ash, which some pilots prefer an update frequency of as long as 12 hours; and

(iv) 3 to 6 hours for wind/temperature forecast and SIGWX forecast, except for SIGWX forecast for high level, which more pilots prefer 1 to 3 hours.

1.4 *Potential new meteorological information/products*

1.4.1 Table 1 contains a list of new meteorological information/products that pilots desired, together with the desirable update frequencies.

1.5 *Most needed meteorological information/products*

1.5.1 Pilots assigned priorities 1 to 5 to their choice of five meteorological information/ products. The following marking scheme was adopted to identify the most-needed information/products:

Mark for priority 1 = 5 (highest priority)
Mark for priority 2 = 4
Mark for priority 3 = 3
Mark for priority 4 = 2
Mark for priority 5 = 1

Total mark = $\sum_{n=1}^{5} (no.\ of\ \ priority\ n)\ x\ (mark\ \ for\ \ priority\ n)$

1.5.2 Figure 1 shows the most-needed meteorological information/products in order of priority based on the above marking scheme.

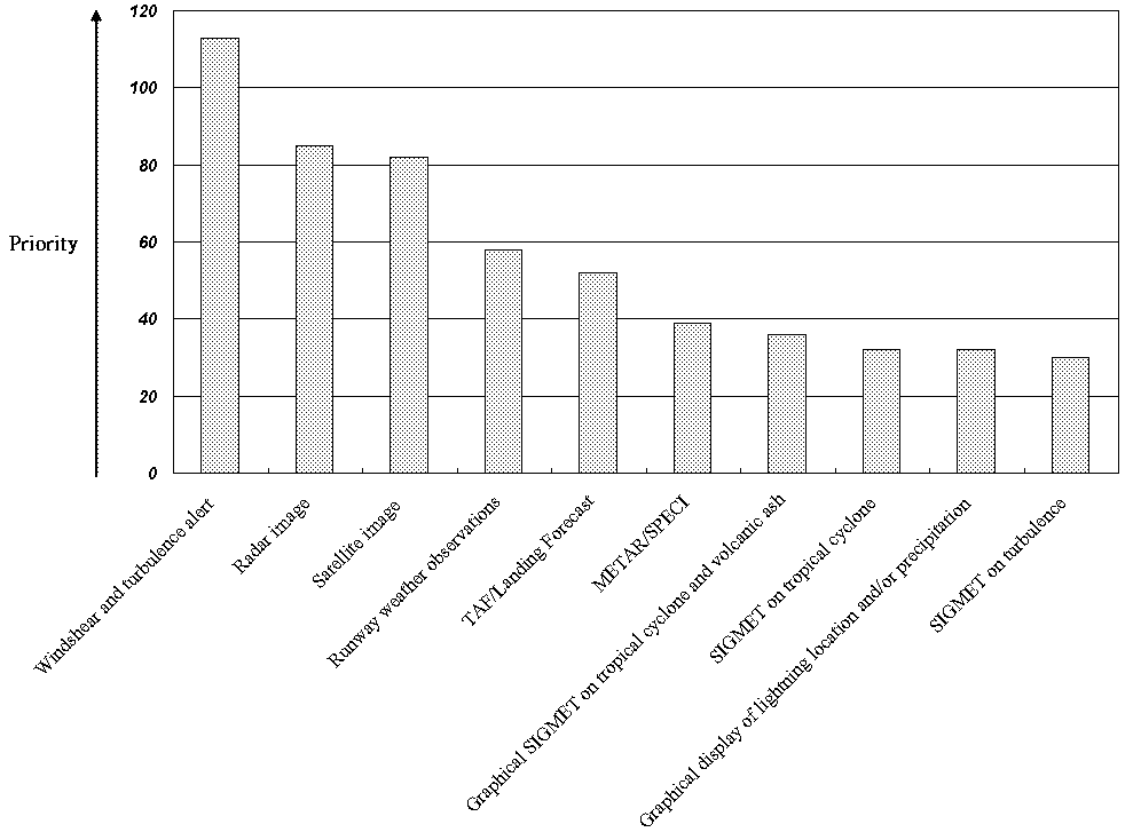


Figure 1 – Top ten most-needed meteorological information/products

2. REMARKS

2.1 Among the first five most needed meteorological information/products, windshear and turbulence alerts as well as runway weather observations are currently made available to the pilots through digital ATIS broadcasts and verbal communications by air traffic controllers. These are essential information for pilots to consider on approach.

2.2 Regarding windshear alerting, Hong Kong, China operates a suite of weather sensors for monitoring of windshear and turbulence conditions in and around the Hong Kong International Airport. These include a Terminal Doppler Weather Radar (TDWR), a LIght Detection And Ranging (LIDAR) and a number of anemometers and weather buoys. Recently, efforts are made to automate windshear alerts based on LIDAR data. Hong Kong, China will explore the use of automatic windshear alerts from the windshear and turbulence warning system for uplinking to the cockpit to meet the need of pilots.

2.3 For radar and satellite images, they are currently made available to airline operators for flight planning. For the purpose of uplinking, the presentation format of these images will need to be developed in consultation with users. An effective means of encoding and compressing the images for uplink is also required.

2.4 Runway weather observations and TAF/Landing Forecasts are currently made available to pilots via data links. Pilots can get access to these information via the D-ATIS and D-VOLMET while flying into or out of Hong Kong, China. A way to uplink runway weather observations and TAF/Landing Forecasts at higher frequencies will be explored.

2.5 A number of templates for uplinking meteorological information have been developed by ICAO and are available for preparing the uplink products.

2.6 To facilitate uplinking of weather products to the cockpit using minimum bandwidth, it is essential to efficiently encode/compress the data, particularly graphical products. Techniques such as GRIB, BUFR and Weather Huffman have been studied for compressing graphical meteorological information. The availability of ICAO standards for efficient graphical compression would facilitate the development of meteorological graphical information uplink.

2.7 To bring forward meteorological information uplink in Hong Kong, China, the following efforts will be made:

(a) develop uplink meteorological products using standard templates. For products without standard templates, presentation format may be designed in consultation with users;

(b) develop communication procedures for secure access taking into consideration the update frequency requirement of pilots;

(c) explore techniques in encoding/decoding of graphical meteorological products for uplink; and

(d) identify cost-effective means for uplinking weather products to cockpit in near-term and long-term.

— — — — — — — —

UPDATED LIST OF DEFICIENCIES IN THE CNS FIELD IN THE ASIA/PAC REGION

Identification		Deficiencies			Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date 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	Relevant sector of ATS routes has been delegated to adjacent ACC.	An action item was developed by a COM coordination meeting held in June 03 to expedite implementation of RCAGs included in a Project. An interim arrangement has been made for implementation of one RCAG site in the southern part of Dhaka FIR.	Civil Aviation Authority of Bangladesh	Target date is set by end of ~~2003.~~2006	A
~~Reliable AFS communications between Kolkata and Dhaka FIRs.~~	~~Bangladesh and India~~	~~HF RTT AFTN circuit had been operating 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~~	~~HF RTT circuit was required to be to be upgraded to LTT. Corrective action required to improve performance of the IDD services initially. A dedicated circuit should be established between Kolkata and Dhaka. IDD service to be provided for~~ ~~Agartala/Dhaka and Dhaka/Guwahati ATS DSC.~~	~~HF RTT circuit was withdrawn. Alternate routing was established via Bangkok/Mumbai/ Kolkata for AFTN traffic between Dhaka and Kolkata. In accordance with action agreed at a COM coordination meeting held in June 03 implementation of~~ A 64 Kbps data circuit was implemented to support AFTN and a hotline IDD implemented for ATS DSC. ~~Agartala/Dhaka, Dhaka/Guwahati and Dhaka/Kolkata ATS DSCs. implemented on IDD hotlines.~~	~~CAA Bangladesh and Airports Authority of India~~	~~November 2003 for upgrading AFTN circuit; and~~ ~~December 2003 for establishment of DSC between Dhaka/Kolkata~~ The 64 Kbps link was used to re-established Dhaka/Kolkata AFTN circuit effective 2 January 2004. A hotline IDD is used for ATS direct speech circuit. The deficiencies have been corrected.	A Official notification of Implementa-tion received and verified through performance report.

Identification		Deficiencies			Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Adequate and reliable VHF COM	Myanmar	Quality and reliability of RCAG VHF inadequate and unavailability of required coverage	1998	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. High-level ICAO mission was conducted. An action plan was developed to upgrade equipment at RCAG stations, provide VSAT link at all RCAG stations, to improve power supply system and to shift ACC to a new location.	DCA Myanmar	Revised target date is end of ~~2003~~ 2004	A

UPDATED LIST OF DEFICIENCIES IN THE MET FIELD IN THE ASIA/PACIFIC REGION

Identification		Deficiencies			Corrective action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Meteorological observations and reports. (Annex 3, Chapter 4)	Solomon I.	Weather information is inadequate and not provided on a regular basis	1996	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. OPMET/E TF to carry out survey	TBD	A
Meteorological observations and reports. (Annex 3, Chapter 4)	Kiribati	METAR from Kiribati not available on regular basis.	1998	Reported by airlines	State's MET authority to consider urgent action to be taken for providing regular observations and reports	Directorate of Civil Aviation, Kiribati. *Note: OPMET/M TF to carry out survey*	TBD	A
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3 p. 4.14 (recom.))	Indonesia	Information on volcanic activity not provided regularly to ATS units and MWOs.	1995 ICAO SIP mission Dec 2003	a) Observed by States concerned. b) Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)	Three-party LOA to be signed between the MGA, DGCA and DVGHM	DGCA, MGA Indonesia *Note: ICAO Regional Office to monitor*	2004	A
	Philippines		1995 ICAO SIP mission May 2003		Three-party LAO to be signed between and PHIVOLCS	PAGASA, ATO Philippines *Note: ICAO Regional Office to monitor*		

Identification		Deficiencies			Corrective action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
	Papua New Guinea		1995 ICAO SIP mission Dec 2003		Procedures to be set up for exchange of data between NWS, ATS and Rabaul Observatory and a LOA to be signed	NWS, ATS Papua New Guinea *Note: ICAO Regional Office to monitor*		
Provision of SIGMET information including SIGMETs for volcanic ash (Annex 3, Chapter 7; ASIA/PAC FASID Table MET 1B)	Indonesia Philippines Papua New Guinea	Requirements for issuance and proper dissemination of SIGMET, including SIGMET for volcanic ash, have not been fully implemented	2000	a) Reported by airlines b) Noted by Volcanic Ash Advisory Centres	a) ICAO to carry out a Special Implementation Project (SIP) with the primary objective to improve implementation of SIGMET procedures, especially for VA. b) State to take urgent actions to implement the SIGMET procedures. *Note: ICAO SIP carried out in 2003*	a) State's Met authorities b) ICAO to implement the SIP. c) ICAO Regional Office to co-ordinate and monitor.	2003 by means of a SIP	U
a) Service for operators and flight crew members. (Annex 3, Chapter 9). b) WAFS products for flight documentation. (ASIA/PAC FASID Table MET 1A).	Cambodia Myanmar	Briefing and flight documentation not provided as required. WAFS products not available	1999	Airlines do not receive the required flight documentation including WAFS forecasts.	States consider urgent action to be taken for installation of SADIS VSAT for receiving WAFS products and OPMET information. Action plan proposed by ICAO MET mission 2003	State's MET authorities	TBD	A

Identification		Deficiencies			Corrective action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
a) TAF for VDPP (ASIA/PAC FASID Table MET 1A) b) MWO for Phnom Penh FIR and SIGMET (Annex 3, Chapter 7; ASIA/PAC FASID Table MET 1B)	Cambodia	TAF is not issued for VDPP Requirements for meteorological watch office (MWO) to be established at Phnom-Penh international airport have not been met.	1992 ICAO MET mission 2003	Lack of trained forecasters for regular TAF service. Serious problems for all airlines flying to VDPP MWO not established due to lack of trained personnel and technical facilities. No SIGMET service for Phnom Penh FIR – serious safety issue.	Action plan proposed by ICAO MET mission 2003 Training of forecasters for issuing TAF urgently required Establishment of MWO currently not feasible. Urgent need for bi-lateral agreement for SIGMET service by a neighboring State.	SSCA, Cambodia	TBD	U
Provision of SIGMET information (Annex 3, Chapter 7; ASIA/PAC FASID Table MET 1B)	~~Bangladesh~~ India Lao PDR Myanmar Nepal	Requirements for issuance and proper dissemination of SIGMET have not been fully implemented.	2000	SIGMET frequently not available Reported by airlines	State's MET authority to take urgent actions to implement the SIGMET procedures. ICAO issued new version of ASIA/PAC Regional SIGMET Guide in September 2003	State's MET authorities *Note:* *ICAO to enquire action plans with fixed target dates from the listed States*	TBD	U

Identification		Deficiencies			Corrective action			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
~~a) Annex 3 provisions for Tropical Cyclone Advisory Centres (TCAC) and for the format of tropical cyclone advisories for aviation~~ ~~b) ASIA/PAC Basic ANP (p.6.2) and FASID Table MET 3A~~	~~India~~	~~TCAC New Delhi does not issue tropical cyclone advisories for aviation~~	~~2003~~	~~Reported by airlines and identified during ICAO attendance to ESCAP/WMO Panel on Tropical Cyclones, 2002 and 2003~~	~~The Authority concerned to take urgent actions to meet requirements of Annex 3 and ASIA/PAC BANP and FASID for provision of tropical cyclone advisory for aviation.~~	~~India Directorate General of Civil Aviation; India Meteorological Department~~	~~2004~~	~~A~~

TERMS OF REFERENCE OF THE

COMMUNICATIONS, NAVIGATION, SURVEILLANCE/METEOROLOGY (CNS/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 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 CNS/MET 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 detriment of priority "A" and "B" tasks.
TOR = Terms of Reference of the Sub-Group

TASKS NO. 1-29 HAVE BEEN COMPLETED AND REMOVED FROM THE LIST

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
30	RAN/3 C.11/10 (TOR 1)	Subject: Ensure effective transition to satellite communications. 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).	CNS/MET	On-going
31	RAN/3 C.11/11 (TOR 1)	Subject: Need for data link to access VOLMET broadcast stations by aircraft. Task: Automation of meteorological information for aircraft in flight (VOLMET) broadcasts.	B	In planning CNS/ATM implementation consider automation of VOLMET broadcast and introduction of D-VOLMET by VOLMET broadcast stations specified in the FASID.	CNS/MET	2008
32	RAN/3 C.8/14 APANPIRG/ 14 (TOR 3)	Subject: Inadequate implementation of procedures for advising aircraft on volcanic ash and tropical cyclones Task: Monitoring of the implementation of international airways volcano watch (IAVW) and tropical cyclone advisories and SIGMETs	A	Monitor and provide assistance in the implementation of volcanic ash and tropical cyclone advisories and SIGMETs procedures to ensure provision of timely information on volcanic ash and tropical cyclones to aircraft.	CNS/MET Task Force on the implementation of Volcanic Ash and Tropical Cyclone advisories and SIGMETs (VA/TC TF)	On going

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
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.	CNS/MET 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 Presentation of the WP on the subject to the CNS/MET/SG/6	CNS/MET New Zealand	Completed
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	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	 CNS/MET CNS/ATM IC SG	On-going On-going On-going On-going

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
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	C 12/24	Subject : Transition to the GRIB and BUFR coded WAFS products Task : Implementation of the transition to the GRIB and BUFR coded WAFS products	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/PAC Region.	CNS/MET SG WAFS Implementation Task Force	Completed July 2005 2004 Completed
38	C12/36	Subject : Lack of ATM requirements for MET components of the ASIA/PAC CNS/ATM Plan. Task : Developing the MET Chapter for the ASIA/PAC CNS/ATM Plan.	A	1. Development of the initial draft of the MET Chapter. 2. Development of the MET components of the CNS/ATM concept/ strategy. 3. Inclusion of ATM requirements for MET information in the CNS/ ATM Plan.	CNS/MET SG with assistance of MET WG on CNS/ATM Plan CNS/MET SG with assistance of the METATM TF	Completed Completed 2005

No.	Ref.	Task	Priority	Action Proposed/In Progress	Action By	Target Date
39	APANPIRG /13 D 13/28	Subject: To improve the efficiency of the regional and inter-regional OPMET exchange and the availability of OPMET information from the ASIA/PAC Region Task: Review and optimize the ROBEX scheme and other OPMET exchanges; introduce monitoring and management procedures for the ROBEX centres and Regional OPMET data banks	A	1) Review and update regional ROBEX tables and relevant documents 2) Propose optimization chages to the ROBEX scheme 3) Improve the availability of OPMET data at the Regional OPMET Data Banks (RODB) 4) Improve the availability of OPMET information from the Pacific States 5) Introduce monitoring and management procedures	CNS/MET SG OPMET Management Task Force	2003 2004 on-going on-going on-going
40	APANPIRG /13 C 13/32	Subject: Quality Management of the meteorological service for the international air navigation Task: Foster the development and implementation of quality management systems by the States' MET authorities/providers in the ASIA/PAC Region	B	1) Review the status of implementation of the quality management system in the region 2) Assist in the organization of regional seminars/workhops to foster exchange of information between the States on the matters of quality management systems	CNS/MET SG	On-going
41		Subject: Regional Strategy for air-ground data communication Task: Develop regional strategy for the implementation of air-ground communication data link	B	Development of AMS data link	CNS/MET SG	2005

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

LIST OF PARTICIPANTS

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
AUSTRALIA (5)	Mr. Jeffrey R Bollard Chief Engineer	Directorate of Safety and Environment Assurance Airservices Australia 25 Constitution Avenue Canberra ACT 2601 AUSTRALIA	Tel: + 61 (2) 6268-4949 Fax: +61 (2) 6268-5695	jeffrey.bollard@airservicesaustralia.com
	Mr. Ted Williams National Manager Aviation Weather Services	Bureau of Meteorology P.O. Box 1289K Melbourne Victoria AUSTRALIA 3001	Tel: +61 (3) 9669-4586 Fax: +61 (3) 9669-4695	t.williams@bom.gov.au
	Mr. Richard John Houghton National Manager Defence Weather Services	Bureau of Meteorology P.O. Box 1289K Melbourne Victoria AUSTRALIA 3001	Tel: +61 (3) 9669-4253 Fax: +61 (3) 9669-4695	r. houghton@bom.gov.au
	Mr. Brian Harris Airspace, Air Traffic & Aerodrome Standards Branch	Aviation Safety Standards Division Civil Aviation Safety Authority GPO Box 2005 Canberra ACT 2601 AUSTRALIA	Tel: +61 (2) 6217- 1808 Fax: +61 (2) 6217-1700)	brian.harris@casa.gov.au
	Mr. Stefan Jerga Manager Product Development	25 Constitution Avenue Canberra ACT GPO Box 367 Canberra ACT 2601 AUSTRALIA	Tel: +61 (2) 6268-4428 Fax: +61 (2) 6268-5688	stefan.jerga@airservicesaustralia.com

Attachment 1 - 2

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
BANGLADESH (2)	Mr. Md. Shahidullah Director (Communication)	Civil Aviation Authority of Bangladesh Headquarter Dhaka - 1229 BANGLADESH	Tel: +880 (2) 891-1011 Fax: +880 (2) 891-3322	dircom@accesstel.net
	Mr. Tapan Kanti Ghose Deputy Director & Station Air Traffic Officer of Zia International Airport	Civil Aviation Authority of Bangladesh Headquarter Dhaka - 1229 BANGLADESH	Tel: + 880 (2) 891-4870-4 Ext. 3426 +880 (2) 891-7451 Fax: -	dircom@accesstel.net
BRUNEI DARUSALLAM (1)	Mr. Hedus Abdullah Aeronautical Telecommunications Engineer	Department of Civil Aviation Ministry of Communications Brunei International Airport Bandar Seri Begawan BB2513 BRUNEI DARUSSALAM	Tel: +673 (2) 330-518 Fax: +673 (2) 333-666	hedus_abdullah@civil-aviation.gov.bn
CHINA (3)	Mr. Xu Jian Liang Senior Engineer MET Division	Civil Aviation Authority of China Air Traffic Management Bureau CAAC 12# East San-huan Road Middle Chaoyang District, Beijing 100022 PEOPLE'S REPUBLIC OF CHINA	Tel: +86 (10) 8778-6827 Fax: +86 (10) 8778-6820	xujl@atmb.net.cn jjllxu@sohu.com
	Mr. Bao Yi Engineer, Radar & Navigation Division	Civil Aviation Authority of China Air Traffic Management Bureau CAAC 12# East San-huan Road Middle Chaoyang District, Beijing 100022 PEOPLE'S REPUBLIC OF CHINA	Tel: +86 (10) 8778-6985 Fax: +86 (10) 8778-6930	baoyi@atmb.net.cn

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
CHINA (Cont'd)	Mr. Song He Bin Engineer, Telecommunication Division	Civil Aviation Authority of China Air Traffic Management Bureau 12# East San-huan Road Middle Chaoyang District Beijing 100022 PEOPLE'S REPUBLIC OF CHINA	Tel: +86 (10) 8778-6918 Fax: +86 (10) 8778-6910	songhebin@atmb.net.cn
HONG KONG, CHINA (3)	Ir Yeung Hoi-wan, Peter Senior Electronics Engineer	Civil Aviation Department Hong Kong Engineering and Systems Division 10th /F, Commercial Building Airport Freight Forwarding Centre 2 Chun Wan Road Hong Kong International Airport HONG KONG CHINA	Tel: +852 2591-5029 Fax: +852-2845-7160 2326-3508	phwyeung@cad.gov.hk
	Mr. Yeung Wai-sun, Sunny Aeronautical Communications Supervisor	Civil Aviation Department Hong Kong Engineering and Systems Division 2nd /F, Telecommunications Unit Air Traffic Control Complex Hong Kong International Airport, Lantau HONG KONG CHINA	Tel: +852 2910-6264 Fax: +852 2910-1160	wsyeung@cad.gov.hk
	Mr. Shun Chi-ming Senior Scientific Officer	Hong Kong Observatory 134A Nathan Road Kowloon HONG KONG, CHINA	Tel: +852 2926-8435 Fax: +852-2375-2645 2311-9448	cmshun@hko.gov.hk

Attachment 1 - 4

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
MACAO, CHINA (4)	Mr. Leong Kai Hong, Derek Chief of Airport Meteorological Office	Rampa Do Observatorio Taipa Grande Caixa Postal No. 93 MACAO, CHINA	Tel: +853 898-6243 862-203 Fax: +853 850-557	meteo@smg.gov.mo khleong@smg.gov.mo
	Mr. Vong Veng Fu Head of Information Technology Service	Administration of Airports Limited Macau International Airport E & M Building Taipa MACAO, CHINA	Tel: +853 898-2380 Fax: +853 898-2387	vongvf@ada.com.mo
	Mr. Sun Shabo Consultant – Telecommunication and Radio Navigation	Civil Aviation Authority Macao, China Rue Dr. Pedro José Lobo, 1-3 Edificio Luso International, 26° andar MACAO, CHINA	Tel: +853 796-4131 Fax: +853 338-089	airportinfrastructure@aacm.gov.mo
	Mr. Lo Veng Tong, Freeman Technical Officer Telecommunication and Radio Navigation	Civil Aviation Authority Macao, China Rue Dr. Pedro José Lobo, 1-3 Edificio Luso International, 26° andar MACAO, CHINA	Tel: +853 511-213 Fax: +853 338-089	freemanlo@aacm.gov.mo
INDIA (3)	Mr. A.K. Misra Executive Director (CNS)	Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 INDIA	Tel: +91 (11) 465-2075 Fax: +91 (11) 465-4142	aaicnsedcom@vsnl.net.in

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
INDIA (Cont'd)	Mr. M.K. Bhatnagar Director, (OPS) Telecom Division	Office of the Director General of Meteorology India Meteorological Department Mausam Bhavan Lodi Road New Delhi 110003 INDIA	Tel: +91 (11) 2469-3186 Fax: +91 (11) 2469-9216	bhatnagarmk@hotmail.com
	Mr. P.K. Singhal General Manager (COM)	Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 INDIA	Tel: + 91 (11) 2462-0287 Fax: + 91 (11) 2462-0287	gmcomchqnad@aai.aero pksinghal@rediffmail.com
INDONESIA (1)	Mr. Novie Riyanto Raharojo Chief of Navigation and Calibration Section	Directorate of Aviation Safety Directorate General of Air Communication JL. Merdeka Barat No. 8 Karya Building, Floor 23rd Jakarta INDONESIA	Tel: +62 (21) 350-6451 Fax: +62 (21) 350-7569	novierianto@telkom.net
JAPAN (4)	Mr. Ryuichi Nagai Special Assistant to Director	Japan Civil Aviation Bureau Air Traffic Services System Planning Division Air Traffic Services Department 2-1-3 Kasumigaseki Chiyoda-ku Tokyo 100-8918 JAPAN	Tel: +81 (3) 5253-8739 Fax: +81 (3) 5253-1663	nagai-r2pt@mlit.go.jp

Attachment 1 - 6

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
JAPAN (Cont'd)	Mr. Morio Miura Special Assistant to the Director	Japan Civil Aviation Bureau Operations and Flight Inspection Division Air Traffic Services Department 2-1-3 Kasumigaseki Chiyoda-ku Tokyo 100-8918 JAPAN	Tel: +81 (3) 5253-8751 Fax: +81 (3) 5253-1664	miura-m2fj@mlit.go.jp
	Mr. Sadayuki Iszuka Senior Manager Air Traffic Control System Division	NEC Corporation 7-1, Shiba 5-chome Minato-ku Tokyo 108-8001 JAPAN	Tel: +81 (3) 3798-6636 Fax: +81 (3) 3798-5450	s-izuka@cq.jp.nec.com
	Mr. Masanori Obayashi Senior Coordinator for Aviation Weather Forecasts	Administration Division Forecast Department Japan Meteorological Agency 1-3-4 Otemachi, Chiyoda-ku Tokyo 100-8122 JAPAN	Tel: +81 (3) 3212-8341 Ext. 3351 Fax: +81 (3) 3284-0180	m_obayashi@met.kishou.go.jp
MALAYSIA (1)	Mr. Tan Huvi Vein Director of KLIA Meteorological Office	KLIA Meteorological Office Malaysian Meteorological Service 1st Floor, Airport Management Centre Kuala Lumpur International Airport 64000 Sepang Selangor Darul Ehsan MALAYSIA	Tel: +603 8787-2386 Fax: +603 8787-1019	thv@kjc.gov.my

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
MALDIVES (1)	Mr. Ali Shareef Senior Meteorological Forecaster	National Meteorological Centre Department of Meteorology Orchid Building, Orchid Magu Male, 20-25 REPUBLIC OF MALDIVES	Tel: +960 326200/323084 Fax: +960 320021/315509	shareef@meteorology.gov.mv admin@meteorology.gov.mv
MONGOLIA (2)	Mr. Ganbaatar Puntsag Manager of Technical Development Division	Civil Aviation Authority of Mongolia Policy and Foreign Relations Department Buyant-Ukhaa International Airport Ulaanbaatar-34 MONGOLIA	Tel: +976 (11) 986-022 Fax: +976 (11) 379-640	ganbaatar@mcaa.gov.mn
	Mr. Batsaikhan Nyamsambuu Inspector, Aerodrome and Air Navigation Inspection Division	Civil Aviation Authority of Mongolia Buyant-Ukhaa International Airport Ulaanbaatar-34 MONGOLIA	Tel: +976 (11) 982-040 Fax: +976 (11) 982-102	N_batsaikhan@mcaa.gov.mn
NEPAL (2)	Mr. Devi Prasad Bhattarai Senior Officer	Civil Aviation Authority of Nepal Tribhuvan International Airport Civil Aviation Office AERO-COM Division Kathmandu NEPAL	Tel: +977 (1) 441-8965 Fax: +977 (1) 447-1411	cnsatm@mes.com.np
	Mr. Deo Narayan Shah Senior Officer	Civil Aviation Authority of Nepal Tribhuvan International Airport Civil Aviation Office COM-NAV AID Division Kathmandu NEPAL	Tel: +977 (1) 478-3659 Fax: +977 (1) 447-1411	shahdeon@yahoo.com

Attachment 1 - 8

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
NEW CALEDONIA (1)	Mr. Michel Argent Directeur Adjoint d' Exploitation	Meteo - France Bp 151, 98846 Noumea NOUVELLE CALEDONIA	Tel: +687 279-302 Fax: 687 279-327	michel.argent@meteo.fr
NEW ZEALAND (2)	Mr. Peter D. Lechner Head of Business Planning and Reporting	Civil Aviation Authority of New Zealand Aviation House 10 Hutt Road Petone P.O. Box 31-441, Lower Hutt NEW ZEALAND	Tel: +64 (4) 560-9400 560-9593 (Dir) Fax: +64 (4) 569-2024	lechnerp@caa.govt.nz
	Mr. Ross Withers ATS Development Manager	Airways Corporation of New Zealand P.O. Box 14 -131 Christchurch NEW ZEALAND	Tel: +64 (3) 358-1517 Fax: +64 (3) 358-1566	ross.withers@airways.co.nz
PAKISTAN (1)	Mr. Muhammad Farooq Janjua Senior Air Traffic Control Officer	Civil Aviation Authority of Pakistan HQ. Civil Aviation Authority, Terminal – I Jinnah International Airport Karachi, PC-75200 PAKISTAN	Tel: +92 (21) 924-8756 Fax: +92 (21) 924-8758	gmats@cyber.net.pk
PHILIPPINES (2)	Mr. Edgardo M. Felisilda OIC, Air Navigation Planning Section	Department of Transportation and Communications Air Transportation Office Old MIA Road, Pasay City Metro Manila 1300 PHILIPPINES	Tel: +63 (2) 879-9166 Fax: +63 (2) 879-9250	airnav@ans.ato.gov.ph

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
PHILIPPINES (Cont'd)	Mr. Jose De Vera Aeronautical Information Officer/ Assistant Chief Airways Communicator	Air Transportation Office 4th Floor, Aeronautical Information Division Air Traffic Service MIA Road, Pasay City PHILIPPINES 1300	Tel: +63 (2) 879-9159 Fax: +63 (2) 879-9288	phil_ais@ats.ato.gov.ph
REPUBLIC OF KOREA (2)	Mr. Chan Soo, Kang Assistant Director Air Traffic Controller	Civil Aviation Safety Authority 274 Gwahae-dong Gangseo-gu Seoul 157-711 REPUBLIC OF KOREA	Tel: +82 (2) 2669-6412 Fax: +82 (2) 6342-7299	atc16@moct.go.kr
	Mr. Ryu Jae-Man Assistant Director CNS System Division	Civil Aviation Safety Authority 274 Gwahae-dong Gangseo-gu Seoul 157-711 REPUBLIC OF KOREA	Tel: +82 (2) 2669-6412 Fax: +82 (2) 6342-7299	yjm71@moct.go.kr
SINGAPORE (3)	Mr. Lam Keng Gaik Chief Meteorological Officer	Main Meteorological Office Operational Services Department Meteorological Services Division National Environment Agency P.O. Box 8, Changi Airport SINGAPORE 918141	Tel: +65 6542-2863 Fax: +65 6542-5026	lam_keng_gaik@nea.gov.sg
	Mr. Lo Weng Kee Senior Engineer (Navaids)	Civil Aviation Authority of Singapore P.O. Box 1 Singapore Changi Airport SINGAPORE 918141	Tel: +65 6541-2445 Fax: +65 6542-2447	lo_weng_kee@caas.gov.sg

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
SINGAPORE (Cont'd)	Mr. Wong Phaey Yuang Manager, Airport & Infrastructure Systems	NCS Communications Engineering Pte. Ltd. #04-023, 4th Storey Singapore Changi Airport Terminal 2, P.O. Box 2838 SINGAPORE 918199	Tel: +65 6541-1771 Fax: +65 6545-7126	wongpy@ncs.com.sg
THAILAND (15)	Mr. Werapong Noumtong Chief of Domestic MET	Bureau of Meteorology for Transportation Thai Meteorological Department 3rd Floor, ATC Building Bangkok International Airport Vibhavadee Rangsit Road Donmuang , Bangkok 10210 THAILAND	Tel: +66 (2) 398-4972 Fax: +66 (2) 399-4597-8	werapong@metnet.tmd.go.th
	Ms. Rassmee Damrongkietwattana Meteorologist	Bureau of Meteorology for Transportation Thai Meteorological Department 3rd Floor, ATC Building Bangkok International Airport Vibhavadee Rangsit Road Donmuang , Bangkok 10210 THAILAND	Tel: +66 (2) 535-4667 Fax: +66 (2) 504-2471	rassmee@hotmail.com
	Ms. Tipsudawan Ruenchinda Meteorologist	Bureau of Meteorology for Transportation Thai Meteorological Department 3rd Floor, ATC Building Bangkok International Airport Vibhavadee Rangsit Road Donmuang , Bangkok 10210 THAILAND	Tel: +66 (2) 535-4667 Fax: +66 (2) 504-2471	r_tipsuda@hotmail.com

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
THAILAND (Cont'd)	Ms. Srisuda Chotwanwirach Meteorologist	Bureau of Meteorology for Transportation Thai Meteorological Department 3rd Floor, ATC Building Bangkok International Airport Vibhavadee Rangsit Road Donmuang , Bangkok 10210 THAILAND	Tel: +66 (2) 535-4667 Fax: +66 (2) 504-2471	sri_nuchot@yahoo.com
	Mr. Perapol Begkhuntod Meteorologist	Bureau of Meteorology for Transportation Thai Meteorological Department 3rd Floor, ATC Building Bangkok International Airport Vibhavadee Rangsit Road Donmuang , Bangkok 10210 THAILAND	Tel: +66 (2) 535-1256 Fax: +66 (2) 535-1256	pira@tmd.go.th pepopepo44@hotmail.com
	Mr. Surasit Jitourtrakul Senior Engineer	Department of Civil Aviation Airport Standards and Air Navigation Facilitating Division 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120 THAILAND	Tel: +66 (2) 287-3194 Fax: +66 (2) 287-2634	jsurasit@hotmail.com JSURASIT@aviation.go.th
	Mr. Choosit Kuptaviwat Director, Planning and Standard ATS Engineering Department	Aeronautical Radio of Thailand Ltd. 102 Ngamduplee Tungmahamek Sathorn Bangkok 10120 THAILAND	Tel: +66 (2) 285-9457 Fax: +65 (2) 285-9538	choosit.ku@aerothai.co.th

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
THAILAND (Cont'd)	Mr. Nuttawat Supanundha Director of Air Traffic Services Engineering & Research Department	Aeronautical Radio of Thailand Limited 102 Ngamduplee Tungmahamek Satorn Bangkok 10120 THAILAND	Tel: +66 (2) 285-9246 Fax: +66 (2) 287-8620	nuttawat@aerothai.co.th
	Mr. Suttipong Kongpool Acting Director Air Traffic Services Planning Department	Aeronautical Radio of Thailand Limited 102 Ngamduplee Tungmahamek Satorn, Bangkok 10120 THAILAND	Tel: +66 (2) 287-8217 Fax: +66 (2) 285-9716	suttipong.ko@aerothai.co.th
	Mr. Thavit Nowvaratkoonchai Executive Officer, Systems Engineering, Air Traffic Services Engineering Research and Development Department	Aeronautical Radio of Thailand Limited 102 Ngamduplee, Tungmahamek, Satorn Bangkok 10120 THAILAND	Tel: +66 (2) 285-9579 Fax: +66 (2) 285-9253	thavit@aerothai.co.th
	Mr. Pornchai Lumtarnwong Administrative Manager	Aeronautical Radio of Thailand Limited 102 Ngamduplee, Tungmahamek, Satorn Bangkok 10120 THAILAND	Tel: +66 (2) 285-8636 Fax: +66 (2) 285-8180	-
	Mr. Sarun Keokomain Division Manager Aviation Service & Supply Operation Safety Aviation Affairs Department	Thai Airways International Public Co., Ltd. 89 Vibhavadee Rangsit Road Bangkok 10900 THAILAND	Tel: +66 (2) 545-3788 Fax: +66 (2) 545-3849	sarun.k@thaiairways.com

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
THAILAND (Cont'd)	Mr. Pichai Pakdeepanich-charoen Senior Avionics Engineer	Thai Airways International Public Co., Ltd. Flight Technical Engineering Department (OU) 89 Vibhavadee Rangsit Road Bangkok 10900 THAILAND	Tel: +66 (2) 545-2806 Fax: +66 (2) 545-3851	pichai.p@thaiairways.com
	Mr. Rittee Saengmay Aircraft Engineer Avionics System Group	Thai Airways International Public Co., Ltd. Technical Department, Engineering Bangkok International Airport Bangkok 10210 THAILAND	Tel: +66 (2) 563-8261 Fax: +66 (2) 504-3360	rittee.s@thaiairways.com
	Mr. Manu Danwungderm Aircraft Engineer Avionics System Group	Thai Airways International Public Co., Ltd. Technical Department, Engineering Bangkok International Airport Bangkok 10210 THAILAND	Tel: +66 (2) 563-8263 Fax: +66 (2) 504-3360	manu.d@thaiairways.com
TONGA (2)	Mr. ´Ofa Fa´ anunu Chief Meteorologist	Ministry of Civil Aviation Kingdom of Tonga P.O. Box 845 Fua´a motu Airport TONGA	Tel: +676 35123 Fax: +676 31994	ofaanunu@mca.gov.to
	Mr. Tino Fuka Air Traffic Management Principal Training Officer	Ministry of Civil Aviation Kingdom of Tonga P.O. Box 845 Queen Salote Road Nuku´alofa TONGA	Tel: +676 35004 Fax: +676-35183	tfuka@mca.gov.to

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
UNITED KINGDOM (2)	Mr. Stephen Copley Group Head Division	FitzRoy Road Exeter Devon EX1 3PB UNITED KINGDOM	Tel: +44 1392 884-205 Fax: +44 1392 885-681	stephen.copley@metoffice.com
	Mr. Richard Orrell Senior International Aviation Analyst	FitzRoy Road Exeter Devon Ex1 3PB UNITED KINGDOM	Tel: +44 1392 884-892 Fax: +44 1392-885-681	richard.orrell@metoffice.com
USA (7)	Mr. Jack McConnell Director/Advisor	FAA/Cerebus 600 Maryland AVE SW Suite 302E Washington DC 20024 USA	Tel: +1 (202) 863-7327 Fax: +1 (202) 314-4557	jack.ctr.mcconnell@faa.gov
	Mr. Robert Hallman Manager NNCC Facility	Federal Aviation Administration 2150 W. 700 N. Bldg#2 Salt Lake City, Utah 84116 USA	Tel: +1 (801) 320-2165 Fax: + 1(801) 320-2117	robert.hallman@faa.gov
	Mr. Dennis Beres Asia-Pacific Representative CNS	Federal Aviation Administration Asia Pacific Office P.O. Box 50109 Honolulu Hawaii 96850 USA	Tel: +1 (808) 541-1244 Fax: +1 (808) 541-3462	dennis.beres@faa.gov

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
USA (Cont'd)	Mr. Kevin Browne Staff Specialist	US FAA ATO-P Aerospace Weather Policy and Standards Staff 800 Independence Avenue, SW Washington, DC 20591 USA	Tel: +1 (202) 385-7706 Fax:+ 1(202) 385-7701	kevin.browne@faa.gov
	Mr. Michael J. Szkil Meteorologist Aviation Services Branch	U.S. National Weather Service 1325 East West Highway OS23, Room 13322 Silver Spring, MD 20910-3283 USA	Tel: +1 (301) 713-1726 Ext. 144 Fax: +1 (301) 713-1520	michael.szkil@noaa.gov
	Mr. Allan D. Storm Civil/Military Aviation Issues	Air Force Flights Standards Agency 1535 Command Dr., Suite D/E Andrews AFB MD 20762 USA	Tel: +1 (240) 857-2146 Fax: +1 (204) 857-3194	allan.storm@andrews.af.mil
	Mr. Thien C. Ngo Electronics Engineer	Federal Aviation Administration Operations Planning and Technology Development 800 Independence Ave., SW Washington, DC20591 USA	Tel: +1 (202) 267-9447 Fax: +1 (202) 267-5111	Thien.Ngo@faa.gov
VIET NAM (5)	Mr. Tran Cong Deputy Director of SORATs	Civil Aviation Administration of Vietnam Tan Son Nhat Airport Ho Chi Minh SOCIALIST REPUBLIC OF VIET NAM	Tel: +84 (8) 442-577 Fax: +84 (8) 844-3705	-

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
VIETNAM (Cont'd)	Mr. Phan Huu Viet Chief of Gia Lam MWO	Air Traffic Management of Vietnam Air Traffic Command and Coordination Center Gia Lam Airport Hanoi SOCIALIST REPUBLIC OF VIET NAM	Tel: +84 (4) 872-1698 Fax: +84 (4) 825-9222	atc_c@hn.vnn.vn
	Mr. Nguyen Van Thang Manager Technical Division	Civil Aviation Administration of Vietnam Gia Lam Airport Hanoi SOCIALIST REPUBLIC OF VIET NAM	Tel: +84 (4) 827-1386 Fax:+84 (4) 827-2597	vatmtech@hn.vnn.vn
	Mr. Hoang Huu Lich Senior Officer in charge of CNS	Civil Aviation Administration of Vietnam Gia Lam Airport Hanoi SOCIALIST REPUBLIC OF VIET NAM	Tel: +84 (4) 827-4191 Fax: +84 (4) 827-4194	hhlich@caa.gov.vn
	Mr. Dao Son Hai Senior Meteorologist	Civil Aviation Administration of Vietnam Gia Lam Airport Hanoi SOCIALIST REPUBLIC OF VIET NAM	Tel: +84 (4) 827-1513 Ext. 439 Fax: +84 (4) 827-4194	dsh@caa.gov.vn
WMO (1)	Mr. N. Tata Diallo Chief, Aeronautical Meteorology Unit	WWW Applications Programme Department World Meteorological Organization (WMO) 7 bis, Avenue de la Paix CH 1211 Geneva 2 SWITZERLAND	Tel: +41 (22) 730-8283 Fax: +41 (22) 730-8128	ndiallo@wmo.int

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
IATA (3)	Mr. Dayanthe Athulathmudali Assistant Director Safety, Operations and Infrastructure, Asia/Pacific	International Air Transport Association 77 Robinson Road #05-00 SIA Building SINGAPORE 068896	Tel: +65 6239-7264 Fax: +65 6536-6267	athud@iata.org
	Mr. Hideki Shimizu Assistant to Director, Captain of Boeing B747-400 Meteorology Flight Operations	Japan Airlines West Passenger Terminal 3-2, Haneda Airport 3 chome Ota-ku, Tokyo 144-0041 JAPAN	Tel: +81 (3) 5756-3136 Fax: +81 (3) 5756-3527	hideki.shimizu@jal.com
	Mr. Hans-Rudi Sonnabend Head of Meteorological Services	Lufthansa Systems Aeronautics GmbH FRA OD/N-M 60546 Frankfurt/Main GERMANY	Tel: +49 (69) 696-90362 Fax: +49 (69) 696-8740	h-r.Sonnabend@lido.net
JICA (1)	Mr. Aguni Yoshimi JICA Expert	Department of Civil Aviation (DCA) Lao Airport Authority (LAA) c/o JICA Laos Office P.O. Box 3933 Vientiane LAO PDR	Tel: +865 (21) 512-215 Fax: +856 (21) 512-215	aguni@laotel.com
SITA (1)	Mr. Lindsay Norrish Consultant	SITA 7 Burnham Street Seatoun Wellington 6003 NEW ZEALAND	Tel: +64 (4) 972-0507 Fax: -	Lindsay.Norrish@paradise.net.nz

Eighth Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG
Bangkok, Thailand, 12-16 July 2004

State/Org.	Name/Position	Address	Telephone/Fax	E-mail
ICAO (3)	Mr. K.P. Rimal Regional Officer, CNS	International Civil Aviation Organization 252/1, Vibhavadee Road Ladyao, Chatuchak Bangkok 10900 THAILAND	Tel: +66 (2) 537-8189 Ext. 155 Fax: +66 (2) 537-8199	krimal@bangkok.icao.int
	Mr. Dimitar H. Ivanov Regional Officer, MET	International Civil Aviation Organization 252/1, Vibhavadee Road Ladyao, Chatuchak Bangkok 10900 THAILAND	Tel: +66 (2) 537-8189 Ext. 153 Fax: +66 (2) 537-8199	divanov@bangkok.icao.int
	Mr. Li Peng Regional Officer, CNS	International Civil Aviation Organization 252/1, Vibhavadee Road Ladyao, Chatuchak Bangkok 10900 THAILAND	Tel: +66 (2) 537-8189 Ext. 158 Fax: +66 (2) 537-8199	pli@bangkok.icao.int

International Civil Aviation Organization

Eight Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG

Bangkok, Thailand, 12-16 July 2004

LIST OF WORKING PAPERS

WP No.	Agenda Item	Subject	Presented by
1	-	Provisional Agenda (Revised)	Secretariat
2	3 (1)	Sixth ATN Transition Task Force Meeting	Secretariat
3	13 (1)	Key Priorities for CNS/ATM Implementation	Secretariat
4	6	Second Meeting of ADS-B Study and Implementation	Secretariat
5	13 (1)	CNS/ATM Implementation and Planning Matrix	Secretariat
6	5	Review of Strategies for Implementation of GNSS Air Navigation Capability and the Provision of Precision Approach and Landing Guidance Systems	Secretariat
7	2	Action on Decisions/Conclusions of CNS/MET SG/7 Meeting	Secretariat
8	14	List of Noted Deficiencies in the CNS and MET fields	Secretariat
9	15	Outstanding Conclusions in the CNS/MET field	Secretariat
10	2	Review of Result of the Future Direction Task Force	Secretariat
11	14	Result of the Deficiency Review Task Force	Chairman of TF
12	4, 5,6 and 7	Result of the Eleventh Air Navigation Conference (2003)	Secretariat
13	2 (2) 7 (2)	Review Relevant Action Items of DGCA Conference Related to CNS/MET	Secretariat
14	7 (2)	Areas of Critical Concern to Aviation that will be Addressed at the ITU World Radiocommunication Conference 2007 (WRC-07)	Secretariat

WP No.	Agenda Item	Title	Presented by
15	15	Terms of Reference and Tasks List of the CNS/MET Sub-Group	Secretariat
16	9	IATA Requirements for TAF	IATA
17	8 (1&2)	Regional Progress in WAFS Implementation	Chairman of TF
18	8 (1)	ASIA/PAC SADIS Strategic Assessment Tables 2005-2008	United Kingdom
19	8 (1)	Developments to the WAFS and SADIS Service	United Kingdom
20	8 (1)	SADIS 2nd Generation (2G) Operational Service	United Kingdom
21	9 (1)	Second Meeting of the OPMET Management Task Force (OPMET/M TF/2)	Chairman of TF
22	9 (2)	New Edition of ROBEX Handbook	Secretariat
23	9 (2)	New Edition of the ASIA/PAC OPMET ICD	Secretariat
24	9 (1)	Study on the AIREP Exchange	Australia & Singapore
25	12	Augmentation of Meteorological Telecommunication Services at Indian Airport	India
26	10 (1)	Regional Progress in IAVW Implementation	Secretariat
27	10 (2)	Implementation of Tropical Cyclone Advisories and Warnings in ASIA/PAC Region	Secretariat
28	11	Review Preparations for the QMS Seminar	Secretariat
29	8	Review of the SADIS OPSG/9 Report	Secretariat
30	9	Protocols for the Transmission of ADS Meteorological Data to WAFCs	New Zealand
31	8	ISCS TCP/IP Transition	Australia
32	13	Report of the work of the METATM Task Force	Chairman of TF
33	3	Migration of AIDC to AMHS	USA
34	3	Develop Aeronautical Telecommunication Network Air Traffic Service Message Handling System (ATN/AMHS) Performance Characteristics and Establish an Aeronautical Fixed Telecommunication Network (ATN) Operational Sunset Date	USA

WP No.	Agenda Item	Title	Presented by
35	10	ASIA/PAC Special Implementation Project on Volcanic Ash SIGMET – 2003	Secretariat
36	9	The Singapore OPMET Databank Traffic	Singapore
37	9	The ASIA/PAC OPMET Data Availability	Singapore
38	8	More Efficient Operational WAFS	China
39	10	Results of the Survey on TC-SIGMETS	Rapporteur of the TF
40	10	SIGMET and Advisories Tests	Rapporteur of the TF
41	10 (2)	(FK) Tropical Cyclone Advisory	IATA
42	5	Revision of Navigation Service in Australia	Australia
43	7 (2)	Preparations for World Radiocommunication Conference 2007 (WRC-2007 by Australian Aviation	Australia
44	10 (1)	Volcanic Ash SIGMET Issues in the Region	Australia
45	3, 9	Migration to BUFR-Coded Aeronautical Meteorological Messages (METAR/SPECI and TAF)	Secretariat
46	9	OPMET Information Monitoring of Bangkok RODB	Thailand
47	9	New OPMET Information Monitoring Software	Thailand

LIST OF INFORMATION PAPERS

IP No.	Agenda Item	Title	Presented by
1	-	Meeting Bulletin	Secretariat
2	12	Enhancement of the Anemometer-based System for Windshear Detection at the Hong Kong International Airport	Hong Kong, China
3	12	Latest Development in the Use of a Doppler Light Detection and Ranging (LIDAR) System for Windshear and Turbulence Detection	Hong Kong, China
4	13	Survey on Pilot's Requirement on Uplinking of Meteorological Information	Hong Kong, China

Attachment 2 - 4

IP No.	Agenda Item	Title	Presented by
5	8	Review of the WAFS OPSG/1 Report	Secretariat
6	3	AIDC Performance Monitoring	Japan
7	3	Relocation Plan of Tokyo AFTN COM Center to Fukuoka	Japan
8	7 (2)	Draft ICAO Position for the ITU World Radiocommunication Conference 2007	Secretariat
9	7 (1)	Overview of Amendments to Article 5 of ITU Radio Regulations Relevant to Aeronautical Radio Services	Secretariat
10	8	Training in the Asia/Pacific Region on GRIB/BUFR in Concert with the Switch on WAFS Scheduled for July 2005	USA
11	8	Implementation of the International Satellite Communications System by the United States	USA
12	12	Area Responsibility of Meteorological Watch Offices Provided by the United States	USA
13	7	Review Preparations for World Radio communication Conference 2007	USA
14	3	Status of Commissioning of AMHS between the United States and Japan	USA
15	6	Universal Access Transceiver (UAT) Use for ADS-B	USA
16	5	Asia-Pacific Regional Navigation Feasibility Study	USA
17	10 (2)	Recent Development of TCAC Tokyo	Japan
18	8 (1)	Experience of Receiving WAFS Products and Data from ISCS with TCI/IP Protocol in Japan	Japan
19	10 (1)	Recent Activities of Japan for IAVW	Japan
20	4	VHF Coverage over Indian Airspace	India
21	3	Improved Connectivity for Data and Voice	India
22	4 (1)	Delayed Data Link Downlink Messages from Aircraft in Australian Airspace	Australia
23	3	Development of the ICAO Register of AMHS Management Domains and Addressing Information	Secretariat
24	8	Testing of Workstation Software	United Kingdom

IP No.	Agenda Item	Title	Presented by
25	6	Status of Safe Flight 21	USA
26	13	Planning for Meteorological Information Uplink	Hong Kong, China
27	12	VOLMET Services	USA
28	12	Launch of a New Satellite Broadcast Service for the Dissemination of Meteorological Data and Products	India
29	3	Delivery of Aeronautical Fixed Telecommunications Network (AFTN) Traffic to Pacific Island States via the Internet	USA
30	5	Status of the US Wide Area Augmentation System (WAAS)	USA
31	4	Implementation of ICAO Standardized Data Links	Secretariat
32	5 (2)	Activities on the Navigation System Panel	Australia
33	6	Decommissioning of Ground-Based Navigation Aids	IATA
34	6	IATA Policy and Positions on Navigation	IATA
35	4	IATA Position on Aeronautical Air-Ground Communications Needs	IATA