AGENDA ITEM 2.2: CNS/MET MATTERS

Agenda Item 2: Asia/Pacific Air Navigation System and Related Activities

2.2 **CNS/MET matters**

2.2.1 The meeting reviewed report of the Eighth Meeting of CNS/MET Sub-group (CNS/MET/SG/8) which was held in Bangkok from 12 to 16 July 2004. The contents of the report were noted with appreciation of the work done by the Sub-group. The meeting expressed satisfaction on the result of actions taken by States and the Secretariat on all Decisions and Conclusions of APANPIRG/14 in the CNS and MET fields. The meeting took the following actions on the report of the CNS/MET SG/8.

Aeronautical Fixed Service

2.2.2 The meeting reviewed the work accomplished by the Sixth Meeting of the ATN Transition Task Force which was held in Bali, Indonesia from 26 to 30 April 2004 and endorsed the draft Conclusions and draft Decisions.

Reference document for the ATN router description

2.2.3 The meeting noted that the ATN Transition Task Force had developed reference document on description for the Asia/Pacific 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 and is posted in the ICAO web site. The document would facilitate implementation of ATN infrastructure in the region.

Study of X.25 protocol

2.2.4 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. 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).

2.2.5 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 should be able to be upgraded to interconnect by using IP when the ATN SARPs have been developed and are mature enough to be implemented. It was also recognized that alternate technology to replace X.25 during the medium term. Accordingly, the meeting adopted the following Conclusion:

Conclusion 15/11 - 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. States not implementing X.25 consider the use of emerging replacement technology.

AMHS addressing schemes and Private Management Domain (PRMD) name value

2.2.6 It was noted that 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 also noted that the response to the ICAO State Letter SP 54/1 – 03/39 dated 30 May 2003, which had requested States to develop AMHS addressing scheme, was not satisfactory, apparently due to lack of clear understanding of the concept. To assist States in this regard Hong Kong, China was requested to develop a comprehensive list of AMHS addressing and PRMD value for all the States in Asia/Pacific 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. Accordingly, meeting adopted the Conclusion:

Conclusion 15/12 – Development of AMHS Addressing Scheme and PRMD value for Asia/Pacific 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/Pacific 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

2.2.7 The meeting noted the AMHS Naming Registration Form developed by the ATN Transition Task Force for registration of essential information of network service access point (NSAP) address of each AMHS and also to include details of designated contact points at each facility for coordination. Based on the experience gained during trial operations on the use of the form and considering the discussion at the meeting, it was proposed to modify the structure of the registration forms to include, among others, two levels of hierarchy for CAAS address. It was also agreed to refer the form to the ATN Transition Task Force for necessary modification and request ICAO to circulate the modified form to States in the Asia/Pacific region for use. In view of the foregoing , the meeting adopted the following Conclusion:

Conclusion 15/13 - AMHS Naming Registration Form

That,

a) the AMHS Naming Registration Form be reviewed and refined by the ATN Transition Task Force based on the result of trial operation; and

b) ICAO be requested to circulate the form to Asia/Pacific States.

AMHS over TCP/IP

2.2.8 It was noted that, at the Fifth Meeting of the Task Force held in 2003, it was agreed that if administrations within the Asia/Pacific 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.

2.2.9 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 adopted the following Conclusion:

Conclusion 15/14 -Use of AMHS over TCP/IP in the Asia/Pacific region

That, Administrations within the Asia/Pacific 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.

AMHS implementation and support of BUFR code

2.2.10 The meeting noted the information provided by France that the AMHS provides the most appropriate way to support the transfer of BUFR coded MET messages. To meet the BUFR requirements, there is no need to implement the full Extended ATS Message Handling Service. The Aeronautical Communication Panel (ACP) is currently developing an appropriate AMHS implementation profile based on ICAO Document 9705. Minor upgrades to the systems which have been already deployed or planned to be deployed in the near future for the Basic ATS Message Handling Service will be sufficient to enable the AMHS to handle binary data as required for the exchange of BUFR-coded MET messages. The meeting also noted the EANPG / AFS Group's recommendation in this regard to consider AMHS implementation profile being developed by the ACP to accommodate BUFR coded message exchanges.

Asia/Pacific ATN Performance Document

2.2.11 One of the tasks assigned to the ATN Transition Task Force was to develop documentation on the ATN Performance. The Task Force developed the ATN Performance Document. However, with a view to avoid duplication of work and considering that the RCP, as described in the document, also included air-ground communication aspect, it was agreed that it should be coordinated with 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/Pacific regional ATN implementation system management operational procedures

2.2.12 The meeting noted that the ATN Transition Task Force had developed a document on the system management for ATN transition guidance. The document was 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. Accordingly, the meeting adopted the following Conclusion.

Conclusion 15/15 – Asia/Pacific regional ATN Implementation System Management Operational Procedures

That, the Asia/Pacific regional ATN Implementation System Management Operational Procedures be published to assist States in implementation of the ATN ground infrastructure in the Asia/Pacific region.

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

2.2.13 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.

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

- Existing AIDC over AFTN;
- Existing AIDC over AFTN/AMHS; and
- Fully ATN compliant AIDC

2.2.15 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.

2.2.16 The meeting noted that the format of the Table CNS-1D was reviewed by the ATM/AIS/SAR SG/14 meeting which did not result in any comment. Accordingly the meeting adopted the following Conclusion.

Conclusion 15/16 – Table CNS-1D - AIDC

That,

a) ICAO be requested to circulate Table CNS-1D provided in **Appendix A** to the Report on Agenda Item 2.2 to Asia/Pacific States to specify operational requirements for AIDC; and

b) provide results to the next meeting of the ATN Transition Task Force for appropriate action.

2.2.17 The meeting noted experience of Japan with regard to the operation of AFTN based AIDC service between Oakland ARTCC and Tokyo ACC. The methodology used 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. was also identified by Japan.

2.2.18 The meeting noted that the ATN Transition Task Force 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 might be a need for co-ordination between the AIDC Task Force and ATN Transition Task Force 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)

2.2.19 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 B.**

In view of the foregoing, the meeting adopted the following Conclusion:

Conclusion 15/17 – 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 B** to the Report on Agenda Item 2.2 through the established procedure.

ATN Router Plan

2.2.20 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 meeting agreed that the existing Table CNS-1B should be replaced with an updated Table provided in **Appendix C** and endorsed the following Draft Conclusion.

Conclusion 15/18 – 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 C** to the Report on Agenda Item 2.2.

ATN implementation/operational activities and issues

2.2.21 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 in 2004 and will carry AFTN messages between Japan and USA.

2.2.22 It was also noted that Australia is replacing its AFTN switch, which is providing three different kinds 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.

2.2.23 The meeting also 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.

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

2.2.25 It was noted that the first ATN link in the region - a 64 Kbps circuit between Bangkok and Hong Kong had been put into operation since June 2004. It was also noted that AMHS training is available at Hong Kong CAD training center.

AFTN Plan

2.2.26 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 D**. The main highlights of AFTN implementation made during 2003 and early 2004 were as follows:

2.2.27 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.

2.2.28 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 adopted the following Conclusion.

Conclusion 15/19 – 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 D** to the Report on Agenda Item 2.2. in accordance with established procedure.

AFTN circuit loading statistics

2.2.29 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.

2.2.30 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

2.2.31 Accordingly the meeting adopted the following Conclusion:

Conclusion 15/20 – 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

2.2.32 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 was accepted, the occupancy level on the Tokyo/Moscow circuit would still far exceed the established occupancy level of 40%.

2.2.33 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.

2.2.34 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

2.2.35 It was noted that the Tokyo AFTN COM Centre is planned to be shifted to Fukuoka where ATM Centre 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

2.2.36 It was noted that Indonesia provided to the Sixth meeting of the ATN Transition 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.

2.2.37 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.

2.2.38 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 connectivity for data and voice communication in India

2.2.39 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.

2.2.40 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

2.2.41 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. AISR users would require only a workstation, modem, printer and operating system, approved browser software and access to Internet. The security would be 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

2.2.42 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.

2.2.43 The meeting noted the updated Subject/Tasks List of the Task Force and adopted the Decision as follows:

Decision 15/21 – Subject/Tasks List of the ATN Transition Task Force

That, the updated Subject/Tasks List of the ATN Transition Task Force provided in **Appendix E** to the Report on Agenda Item 2.2.be adopted.

Proposal for new tasks

2.2.44 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:

Decision 15/22 – Assignment of new tasks

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

2.2.45 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.

Air Ground communications

Regional strategy for the implementation of AMS communications data links

2.2.46 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.

2.2.47 The Asia/Pacific 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 CNS/MET Sub-group considered it necessary to develop a corresponding strategy for the selection

and implementation of an AMS communications data link. It was noted that a Task Force was established by the Sub-group to conduct appropriate consultations, identify factual information and to develop a regional strategy for implementation of AMS data link in the Asia/Pacific region and would present its result to the ninth meeting of the CNS/MET Sub-group in July 2005.

VHF coverage in Indian airspace

2.2.48 The meeting noted information on the improvement and enhancement of VHF coverage in Indian airspace in the Oceanic region.

2.2.49 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.

2.2.50 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.

2.2.51 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.

2.2.52 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 enhanced coverage does not cause interference to other facilities.

Report and analysis of ADS/CPDLC problems

2.2.53 The difficulty caused by delayed data messages from aircraft in Australian airspace was noted. 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”.

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

Navigation systems

Regional strategies

2.2.55 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.

2.2.56 The meeting noted recommendations of AN-Conf/11 and also additional information provided by States. The meeting noted that the strategies were generally consistent with the AN Conf/11 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). Accordingly the meeting adopted the following Conclusion.

Conclusion 15/23 - Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the Asia/Pacific 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/Pacific region provided in **Appendices F and G** respectively, to the Report on Agenda Item 2.2 be adopted.

Transition planning

2.2.57 The meeting noted that Australia intended 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.

2.2.58 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.

2.2.59 It was emphasized that 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.

FASID Table CNS-3

2.2.60 The meeting recognized the need to the conduct a short review of the Table CNS-3. 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 adopted the following Conclusion;

Conclusion 15/24 - Revision of FASID Table CNS-3 by States

That, States review and revise FASID Table CNS-3 to reflect 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.

Surveillance

ADS-B study and Implementation Task Force

2.2.61 The meeting reviewed the work accomplished by the second meeting of the ADS-B Study and Implementation Task Force held in Bangkok from 22 to 26 March 2004. It was noted that report was also reviewed by CNS/MET SG/8 and ATM/AIS/SAR SG/14.

ADS-trials, demonstration and implementation activities conducted by States

Australia

2.2.62 The meeting noted the status of the operational trial conducted in airspace surrounding Bundaberg, Queensland approximately 300 km north of Brisbane. ADS-B processing and display functions were fully integrated into The Australian Advanced Air Traffic System. It was noted that the objective of ADS-B upper airspace 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 had been completed. Australia has purchased 27 ADS-B ground stations for use above FL 300 and 2 additional ground stations supporting airspace below FL300. Each station is expected to have coverage up to 250 NM. All installations will occur at locations at which collocated VHF stations are being upgraded. All ground stations are expected to be operating by the end of 2005. Airservices Australia is working with a number of vendors to demonstrate low cost avionics. ADS-B is considered as a viable and economic alternative to existing SSR for en-route surveillance in Australia. It is envisaged that mandatory fitment and use of ADS-B will be introduced in the medium traffic density en-route airspace of Australia before 2009

China

2.2.63 The meeting noted plan for trial and implementation and ADS-B in western part of China. SSR Mode-S 1090 ES link will be used as the ADS-B link for the 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. 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 has set-up an ADS-B working group comprising members from Civil Aviation Department, local airlines, IFALPA, etc. Hong Kong, China is conducting ADS-B test for airport surface surveillance function in 2004 and 2005 using “ASMGCS” trial system, which could display ADS-B reports from aircraft.

India

2.2.64 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. The study group reviewed the current situation of the CNS infrastructure in India including ATS route structure, aircraft movement data, VHF stations, RCAG stations, HF RT stations, surveillance radars and their coverage, details of NDB and DVOR stations, airline operators and their fleet, avionics equipage, etc. Since the Indian continental airspace is almost covered by radar, ADS-B was to be considered as a supplement to fill the gaps which are not covered by radar to enhance safety and airspace capacity. 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. AAI is planning to purchase a new aircraft for flight inspection with SSR Mode-S ES for ADS-B trial.

Mongolia

2.2.65 FANS ADS-C was introduced a couple of years ago with a good coverage for the international air routes. Mongolian CAA is also planning to start a trial with Mode-S ES ground station to be installed in Ulaanbaatar. The trial will be very special since it will include ADS/C, ADS/B over VDL Mode-4 and ADS/B over Mode Mode-S ES for international operation. Mongolia will coordinate with neighbouring States for future implementation of ADS-B to provide a seamless coverage.

Indonesia

2.2.66 The SSR Mode S 1090 extended squiter link is planned to be used for ADS-B 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

2.2.67 ADS-B related activities are being undertaken by ADS-B Planning and Implementation Working Group (ADS-B WG) established by Japan. 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 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. 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 detection probability was 100% on the arc flight, but loss of targets occurred on the outbound and inbound flight. The comprehensive evaluation tests will be conducted in financial year 2005.

USA

2.2.68 It was 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). To date, this requirement has cantered 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;
- 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; and
- Spiral Three: Fielded in 2013-2016, will provide additional interfaces into en route automation systems

2.2.69 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: http://www.alaska.faa.gov/capstone/

ADS-B capable avionics

2.2.70 It was noted that the major drivers for the recent upgrades to avionics were European Elementary Surveillance (ELS) and Enhanced Surveillance (EHS) programmes. Boeing had taken the ELS/EHS upgrade opportunity to incorporate ADS-B/Mode-S ES in anticipation of upcoming ADS-B requirements. Boeing is upgrading the Mode-S transponder installation to ARINC 718A compliant transponders, which are compliant with ICAO Annex 10, Amendment 77 and are capable of supporting ELS/EHS/ES functions. 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. The Airbus transponder installation is compliant with ICAO SARPS Annex 10 Amendment 77, RTCA DO181B or C, EUROCAE ED73A, and ARINC/AEEC 718A. The meeting noted the activities related to the development and demonstration of avionics for general aviation and small regional aircraft being conducted by Australia.

Avionics standards organizations

2.2.71 It was noted that the Task Force had recommended States in the region to actively participate in the ADS-B related meetings of Eurocae, AEEC and RTCA in order to bring the Asia/Pacific perspectives to the development of avionics standards to facilitate early implementation of air-ground ADS-B capabilities in Asia/Pacific region.

Industry's perspective on ADS-B

2.2.72 It was 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. 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. This station is capable of uplinking traffic data to mobile users. The output format complies with the ASTERIX standard, Category 21. The meeting noted the current activities and programmes conducted by Sensis Corporation, which designs & manufactures ADS-B ground station infrastructure. It was stated currently more than 400 Mode-S ADS-B capable ground stations installed throughout the US and Europe today and testing of the system is being undertaken by Hong Kong, China.

Airlines equipage plans

2.2.73 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 recognizing 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). It was considered 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 adopted the following Conclusion.

Conclusion 158/25 - 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/Pacific region and provide result to the ADS-B Task Force Working Group to be held on 14-15 October 2004.

2.2.74 The meeting also noted the need to conduct a large-scale survey for deployment plan of those non IATA member airlines, regional carriers as well as those State aircraft. It was noted that this suggestion would be considered by ADS-B Task Force for further action.

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Near-term definition

2.2.75 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.

Three city pairs

2.2.76 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. It was noted that the Task Force 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, it was agreed to examine Sydney-Singapore, Hong Kong, China-Tokyo, and Singapore-Delhi city pairs.

2.2.77 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.

2.2.78 The meeting noted that the draft conclusion developed by the ADS-B Task Force to plan at the early stages of deployment of ADS-B to share surveillance data. i.e. there is potential to share surveillance data in at least the following environments including Australia & Indonesia, Papua

New Guinea, Fiji, New Zealand; Indonesia & Singapore and China & Japan. In view of foregoing, the meeting adopted the following Conclusion.

Conclusion 15/26 – 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 contact point for implementation

2.2.79 The meeting noted the need identified by the ADS-B task for to establish a problem reporting database similar to that used successfully by ISPACG. The meeting agreed the proposal of establishment of a database, which will be initially managed by Australia. The meeting noted that the ADS-B Task Force had recognized the need to invited States to provide contact points for ADS-B study and implementation. The meeting noted Tasks List containing the various activities required to be addressed by the Task Force and adopted the following Decision:

Decision 15/27 – 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 H** to the Report on Agenda Item 2.2 be adopted.

2.2.80 The meeting noted that result of discussions on the report of ADS-B Task Force by ATM/AIS/SAR/SG/14 and CNS/MET/SG/8. It was agreed to refer the comments made by the Sub-groups to the Task Force for further action and study.

Aeronautical electromagnetic spectrum utilization

2.2.81 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

2.2.82 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.

2.2.83 The meeting noted that there are significant issues that have implications for aviation resulting from WRC-2003.

2.2.84 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

2.2.85 The meeting noted the course of action proposed for the development and finalization of ICAO position for WRC-2007.

2.2.86 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/Pacific Regional Office detail of designated focal point or contact person in each Administration responsible for preparation for WRC 2007. It was noted that most 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.

Regional preparatory meetings

2.2.87 It was recognized that the two Regional Preparatory Meetings conducted for WRC-2003 at the Asia/Pacific 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 further that the second APT Regional Preparatory Group Meeting for WRC-2007 is expected to be held during early March 2005.

Preparation for WRC- 2007 by Australia and USA

2.2.88 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 modernization 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.

2.2.89 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.

2.2.90 It was noted that IATA had 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.

Progress in implementation of the ISCS and SADIS

2.2.91 FASID Table MET 7, which indicates the current status of implementation of SADIS and ISCS broadcasts in the Asia/Pacific region, was reviewed and updated, as necessary.

Follow-up of the SADISOPSG/9 meeting

2.2.92 The meeting reviewed the executive summary of the ninth meeting of SADISOPSG, Dakar, 1 to 4 June 2004, and noted that two draft conclusions were formulated for consideration by the PIRGs concerned, as follows:

SADIS Internet-based FTP service.

2.2.92.1 It was recalled, 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. Based on the recommendation by the SADISOPSG/9 meeting, and in order to formalize the role of the SADIS Internet-based FTP service, the meeting formulated the following conclusion:

Conclusion 15/28 – 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.

SADIS strategic assessment tables

2.2.92.2 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/Pacific States will soon be included in the regular exchange and relayed to the SADIS provider for uplink, the projected data volumes were slightly revised. The meeting agreed on the revised tables and formulated the following draft conclusion:

Conclusion 15/29 - SADIS strategic assessment tables

That, the Asia/Pacific SADIS strategic assessment tables, as given in **Appendix I** to the report on this agenda item, be adopted and forwarded to the SADISOPSG for planning the future SADIS bandwidth requirements.

2.2.93 The meeting noted the information regarding the introduction by the SADIS provider of the SADIS second generation (SADIS 2G) service as from 1 September 2004. 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 scheme would require all SADIS users to purchase a new receiver that is compatible with the 2G broadcast. It was also noted that there would be a four year transition period of dual operation of the SADIS 1G and SADIS 2G services until 31 December 2008. In view of the obvious advantages of the SADIS 2G service, the meeting agreed that the SADIS user States in the Asia/Pacific region should be encouraged to start planning for the transition from SADIS 1G to 2G and formulated the following conclusion:

Conclusion 15/30 - State's migration plans for the transition from 1G to 2G SADIS service

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

Note: ICAO Regional Office to inform the SADIS user States by a State letter (4th quarter of 2004) and keep record of the progress of the transition to SADIS 2G.

Implementation of the ISCS

2.2.94 The meeting was informed that the transition to the TCP/IP successor ISCS network, undertaken by the ISCS Provider State, was nearing completion, but the switch to TCP/IP only broadcast had not yet been accomplished. The meeting was assured that the ISCS Provider would take all necessary action to resolve the residual problems with the TCP/IP broadcast. In the meantime, the dual broadcast of X.25 and TCP/IP protocols had been extended and the ISCS provider State would notify ISCS users and ICAO at least two weeks prior to the cessation of the X.25 broadcast.

2.2.95 The meeting agreed that a mechanism for monitoring the ISCS implementation in the Asia/Pacific region should be utilised and recalled outstanding APANPIRG Conclusion 9/18, which required the conduct of a survey of the operational efficacy of the ISCS/2. It was noted that the action on the above conclusion was postponed until the time the new generation ISCS became operational. Since this has been already achieved, the meeting agreed that regular annual survey of the operational efficacy of the ISCS/2 should be conducted in a format similar to the annual SADIS operational efficacy survey. To facilitate the annual survey and the coordination of other ISCS operational matters, the meeting supported a proposal for nomination of ISCS focal point by each ISCS user State. The member formulated the following conclusion:

Conclusion 15/31 - Annual survey of the ISCS/2 operational efficacy and nomination of ISCS Focal Points

That,

a) the ISCS provider State be invited to conduct, in coordination with the ICAO Regional Office, annual surveys of the operational efficacy of the ISCS/2 in the Asia/Pacific region, starting with a survey for 2004-2005; and

b) the ISCS user States in the Asia/Pacific region be invited to nominate operational personnel to act as an ISCS focal point to facilitate coordination of ISCS implementation matters.

Notes:

(1) The survey will be carried out through a survey questionnaire circulated to the ISCS user States by the ICAO Regional Office; the survey results will be analyzed by the ISCS provider State and reported to the CNS/MET Sub-group of APANPIRG.

(2) 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.

Transition to GRIB and BUFR coded WAFS products

2.2.96 The meeting was informed of the review carried out by the CNS/MET SG/8 meeting of the results of the latest assessment of the SADIS visualization software packages conducted by the SADIS Provider State during February and March 2004. This assessment 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 have safety implications, e.g. tropical cyclone symbol missing/obscured. 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. In view of this, the meeting agreed to invite the WAFSOPSG to consider a 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, in order to ensure that most WAFS users are prepared to process BUFR-coded SIGWX forecasts, and formulated the following conclusion:

Conclusion 15/32 – Limited extension of the availability of WAFS forecasts in chart form beyond 1 July 2005

That, the WAFSOPSG be requested 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.

2.2.97 The meeting realized that less than one year was 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. In view of the very short time remaining, States should be reminded that any request for financial assistance under the WMO Voluntary Cooperation Programme (VCP) 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. However, in view of the short time left, it would be unlikely that sufficient funds could be made available through the WMO VCP unless the WMO Permanent Representatives of the States concerned gave high priority to this issue and took appropriate action within WMO.

2.2.98 The meeting was informed that the SADIS and ISCS provider States agreed to organize a joint training on the operational production of WAFS charts from GRIB and BUFR coded WAFS products for the SADIS and ISCS user States in the Asia/Pacific region. The training will be conducted by instructors from the UK Met Office and will be held at the ICAO Regional Office in January 2005.

2.2.99 It was considered important that the SADIS and ISCS user States in the Asia/Pacific region should be made aware of the evaluation results of the visualization software packages and should make full use of the conjoint training on the operational use of GRIB and BUFR coded WAFS products. Therefore, the meeting formulated the following conclusion regarding the actions to be undertaken by the States, as a matter of urgency, to ensure the successful migration to the operational use of GRIB and BUFR coded WAFS products:

Conclusion 15/33 – States' actions for the migration to the operational use of GRIB and BUFR coded WAFS products

That, the Asia/Pacific States

(a) 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 the target date for final migration to GRIB and BUFR-coded WAFS products, 1 July 2005;

(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; and

(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/Pacific region in January 2005.

2.2.100 The meeting noted that WAFSOPSG/1 meeting, held in Lima, 10 to 14 November 2003, did not support APANPIRG Conclusion 14/31 on the automatic production of SIGWX charts from BUFR-coded WAFS products. 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 for which States would continue to provide charts as part of the flight documentation. The intention was to eliminate the need of human intervention in the generation of WAFS SIGWX charts compliant with Annex 3 requirements. 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 view of this, the meeting formulated the following conclusion:

Conclusion 15/34 – 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 would liase with the WAFS workstation manufacturers with a view of carrying out a further evaluation of their software against this new requirement.

Asia/Pacific WAFS Implementation Plan

2.2.101 The meeting reviewed and updated the Asia/Pacific WAFS Implementation Plan and Procedures and the work programme of the WAFS Implementation Task Force in view of the changes in the plans and schedules of the two WAFCs in the migration to GRIB and BUFR coded products.

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

2.2.102 The Second Meeting of the Asia/Pacific OPMET Management Task Force (OPMET/M TF/2) was held in Bangkok, Thailand from 10 to 13 February 2004. The meeting

reviewed the current status of the regional and inter-regional OPMET exchange and the operations and content of the Regional OPMET Data Banks (RODB). The meeting considered new requirements for OPMET exchanges under the ROBEX scheme. It was agreed that the available 9 and 12-hour TAF from the Asia/Pacific States should be included in the exchange. The meeting stressed on the need to improve the availability of AIREP, SIGMET and advisories and formulated corresponding action items. The meeting considered also the development of OPMET management procedures, in particular, procedures for monitoring the OPMET data availability and regularity, the OPMET bulletins update procedure, procedures for SIGMET tests, OPMET data banks quality control procedures.

2.2.103 The meeting reviewed the 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:

Decision 15/35 – 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 J** to this agenda item of the Report.

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

2.2.104 The meeting recalled that the *ROBEX Handbook* was the main regional guidance material providing detailed procedures for OPMET exchange in the Asia/Pacific and Middle East ICAO regions under the ROBEX scheme. The meeting noted that a fully revised 12th edition of the ROBEX Handbook as well as a new 3rd edition of the ASIA/PAC ICD for access to the OPMET Data Banks were prepared by the ICAO Regional Office and reviewed by the CNS/MET SG/8 meeting. The meeting agreed that the two documents should be published and circulated to the States and formulated the following conclusion:

Conclusion 15/36 – 12th edition of the *ROBEX Handbook* and 3rd edition of the *ASIA/PAC ICD*

That, ICAO Regional Office 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), in accordance with the established procedures.

Note: Both documents are available on the ICAO Regional Office web site as part of the CNS/MET SG/8 documentation.

Issues related to the format of the METAR and TAF bulletins

2.2.105 The meeting noted with concern the findings of OPMET/M TF 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 conclusion:

Conclusion 15/37 – Fostering the standardization of OPMET information in the Asia/Pacific region

That, the States in the Asia/Pacific 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: ICAO Regional Office to circulate a State letter and provide the States concerned with specific information regarding the observed discrepancies from the standard formats.

Issues related to AIREP exchange

2.2.106 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 agreed to conduct a survey on AIREP exchange with the Asia/Pacific and Middle East States in order to collect information on the availability and the usage of the AIREP information, and to verify the adequacy of the ROBEX procedures on the AIREP exchange.

2.2.107 The meeting noted that the WMO abbreviated heading currently used for the AIREP bulletins, exchanged through the AFTN, did not make any distinction between the routine and special air-reports; the data type designator UA was used for both. Knowing that the Annex 3 requirements for the dissemination of the routine (AIREP) and special air-reports (SPECIAL AIREP) reports were different, it was considered necessary to introduce a new data type designator for the special air-reports in order to ensure their proper exchange. Taking into account that, according to the *Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization* (Doc 7475), matters related to the aeronautical meteorological codes should be addressed to the WMO, the meeting formulated the following conclusion:

Conclusion 15/38 – 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.

Proposal for TAF with extended period of validity

2.2.108 The meeting was informed of the 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), it was considered that the current 18-hour or 24-hour TAF were not sufficient for the flight planning phase. Some operators have indicated a requirement for TAF with a validity period of at least 30-hour. The meeting considered these new requirements as a significant change to the current Annex 3 provisions, therefore, ICAO should study the feasibility of extending the validity of TAF. It was also recognized that this was “global” rather than a regional issue. The following conclusion was formulated:

Conclusion 15/39 – Feasibility of extending the validity of TAF to 30 hours

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

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

2.2.109 The meeting was informed that the Fourteenth WMO Congress held in Geneva, 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.

2.2.110 The meeting recognized that the transition to the TDCFs for aeronautical meteorological messages would be a major undertaking and potentially expensive. Therefore, in order to ensure an orderly migration to the TDCFs, it was recommended that detailed regional implementation plan should be developed by MET and CNS experts.

2.2.111 The communication problems related to the transition to TDCFs were outlined. With the introduction of AMHS it would be expected that the OPMET 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/Pacific 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.

2.2.112 The meeting agreed that the task to address the migration to TDCFs should be assigned to the existing ATN Transition Task Force, which reported directly to APANPIRG, and to the OPMET Management Task Force, which reported 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 jointly.

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

Decision 15/40 – 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 conducting studies, as necessary;

b) the two Task Forces develop in coordination a regional plan for migration to BUFR-coded aeronautical meteorological information by the end of 2005.

Progress in the implementation of the IAVW in the Asia/Pacific region

2.2.114 The meeting reviewed the conclusions and decisions by the first meeting of IAVWOPSG, which required follow-up action by the ICAO regions. The meeting noted IAVWOPSG Conclusion 1/13 regarding the development of a new table (FASID Table MET 3C) listing the State volcano observatories required to provide information on volcanic activity and/or volcanic ash clouds to the corresponding ACCs, MWOs and VAACs. In order to assist the PIRGs, IAVWOPSG developed a set of principles, which would allow an equitable evaluation of State volcano observatories for inclusion in the regional ANPs. The meeting agreed that the Asia/Pacific States with active volcanoes should be consulted in order to designate the volcano observatories for inclusion in the new FASID Table MET 3C, based on the principles developed by IAVWOPSG. The meeting formulated the following conclusion:

Conclusion 15/41 – Designation of State volcano observatories

That, the Asia/Pacific States that maintain monitoring of active volcanoes, be invited to designate, based on the principles formulated by the IAVWOPSG/1 meeting, selected volcano observatories for inclusion in the new FASID Table MET 3C of the ASIA/PAC FASID (Doc 9673).

2.2.115 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.

Development of test procedures for volcanic ash (VA) and tropical cyclones (TC) SIGMET

2.2.116 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. In this regard, the VA/TC Implementation task force of the CNS/MET SG had drafted procedures for conducting regional tests on the issuance and dissemination of VA and TC advisories and SIGMETs.

2.2.117 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. It was agreed that detailed test procedures should 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.

2.2.118 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/Pacific region should contribute actively to their implementation. Therefore, the meeting formulated the following Conclusion:

Conclusion 15/42 – Conducting SIGMET tests in the Asia/Pacific region

That, ICAO Regional office invite all TCAC and VAAC Provider States in the Asia/Pacific region, and all Asia/Pacific States with MWOs responsible for issuance of SIGMET for volcanic ash and/or tropical cyclones, to take part in the SIGMET tests to be carried out according to procedures developed by the VA/TC Implementation Task Force.

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

Tropical cyclone advisories and SIGMET issues

2.2.119 The meeting recalled that APANPIRG Conclusion 14/41 called for implementation, as a matter of urgency, of the requirements for issuance of TC advisories by TCAC New Delhi and that the non-implementation of the advisory service by TCAC New Delhi was included in the APANPIRG List of Air Navigation Deficiencies with urgent priority.

2.2.120 The meeting was informed that as a follow-up of the above conclusion an action plan was set up by India and the issuance of TC advisories by TCAC New Delhi was introduced in the beginning of 2004. Though some technical issues related to the format of the TC advisories by TCAC New Delhi were yet to be fully implemented, the meeting considered that the main issue regarding the availability of advisory information was resolved and that the MET deficiency related to TCAC New Delhi, should be considered eliminated and removed from the List of Air Navigation Deficiencies.

2.2.121 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 for the Region. This issue was addressed by a survey of the Asia/Pacific States on the issuance of TC SIGMET carried out by the VA/TC Implementation Task Force. Based on the survey results it was identified that some States used as a source of information for the issuance of TC SIGMET, information other than the 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 might lead to inconsistency between TC advisories and TC SIGMETs.

2.2.122 The meeting recognized that Annex 3 stated clearly that the TC SIGMETs should be based primarily on the advisories issued by the TCACs, designated in the regional ANP. It was also recalled that 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 to ensure that the best expertise available is used in the ICAO TC warning system. In view of this, the meeting agreed that the States should be urged to improve the usage of the TCAC's products in the issuance of TC SIGMETs and formulated the following conclusion was:

Conclusion 15/43 – Improvement of issuance of SIGMET for tropical cyclones

That, the Asia/Pacific States 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.

Note: ICAO Regional Office to send a State letter to the States concerned be the end of 2004

Quality assurance in the MET field

2.2.123 Under this agenda item the meeting was updated on the status of preparation of the Asia/Pacific 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. 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 for October 2004. However, due to a WMO decision to postpone all training activities in the field of aeronautical meteorology, not funded under the WMO regular budget, until the summer of 2005, the QMS seminar had to be postponed for the second half of 2005, subject to further confirmation by WMO.

MET support for operations at aerodromes and terminal areas

2.2.124 The meeting noted information on recent developments in the windshear and turbulence detection at the Hong Kong International Airport. These developments encompassed introduction of a new anemometer-based automatic windshear detection and alerting algorithm and the use of a pulsed Doppler LIDAR for detection of windshear and turbulence 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.

Area of responsibility of MWOs provided by the United States

2.2.125 The meeting was informed of the decision 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 Guam will move to MWO provided by the WFO in Honolulu. Information regarding the changes above should be provided to ICAO Secretariat in order to amend the ASIA/PAC FASID Table 1B accordingly.

Provision of VOLMET service by the United States

2.2.126 The meeting was informed of the HF VOLMET broadcasts provided by the U.S. and on the intention to continue such broadcast in the foreseeable future. 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 CNS/ATM 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.

MET component of CNS/ATM

2.2.127 As a follow-up of APANPIRG Conclusion 13/30**,** a regional survey on the current status and future plans of States to process the MET component of ADS reports was conducted by the MET/ATM Task Force of the CNS/MET SG.

2.2.128 Concern was expressed of the lack of operational procedures regarding the processing and use of the MET block of the ADS messages. In discussing this issue, the group noted the current Annex 3 provisions 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

2.2.129 The meeting was informed that as a follow-up of APANPIRG Conclusion 14/45 the MET/ATM task force had been involved in the organization of a MET/ATM coordination seminar and WMO had been approached regarding the availability of funds. The date and venue of the seminar have not yet been specified, however, a tentative programme for the seminar was under preparation with the view of holding it in 2005.

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

2.2.130 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/Pacific region. The updated Tasks List is provided in **Appendix K**

In view of the foregoing the meeting adopted the Decision as follows:

Decision 15/44 - 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 K** to the Report on Agenda Item 2.2.be adopted.

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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

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 TBD – To be determined
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)	TBD	
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)	TBD	
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)	TBD	

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 TBD- To be determined
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	TBD	
		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	TBD	
		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	TBD	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	TBD	
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	TBD	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	TBD	

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:

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.

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
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/AGGG	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						

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
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/VYYY	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						

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

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
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						

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
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 measure
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

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						

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 measure
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/LIII	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

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 (Monitor development in ACP)
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)

UPDATED STRATEGY FOR THE PROVISION OF PRECISION APPROACH AND LANDING GUIDANCE SYSTEMS

Considering:

a) in the Asia/Pacific 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.

~~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/Pacific region and other ICAO regions and to provide flexibility for future aircraft equipage.

The strategy for Asia/Pacific 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/PACIFIC REGION

Considering that:

1) Safety is the highest priority;

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

3) GNSS 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/Pacific 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 SBAS 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/Pacific 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.

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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 regions and develop proposals for their optimization taking into account the requirements by the aviation users and the current trends for global OPMET exchange;

- Develop monitoring and management procedures related to ROBEX exchange and other exchanges of OPMET information;

- Regularly update the regional guidance material related to OPMET exchange;

- Liaise with other groups dealing with communication and/or management aspects of the OPMET exchange in ASIA/PAC and 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 Management Task Force includes:

(a) to examine the existing and any new requirements for OPMET exchange in ASIA/PAC and MID regions and 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 prepare proposal for updating and optimizing of the schemes;

(c) to review and update the procedures for interregional OPMET exchange and ensure the availability of the required ASIA/PAC and MID OPMET data for the AFS satellite broadcasts (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 covers procedures for the exchange of all required OPMET 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 exchange; to foster implementation of quality management of OPMET data by the ROBEX centres and the RODBs.

Note: It is recommended that the EUR OPMET quality control and management procedures be reviewed and utilized in developing 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) Representatives of IATA, EUR BMG and MID OPMET Bulletin Board are invited to participate in the work of the Task Force

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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/Pacific 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