INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

REPORT OF THE NINTH MEETING OF THE

APANPIRG CNS/ATM IMPLEMENTATION CO-ORDINATION SUB-GROUP

(CNS/ATM/IC/SG/9)

Bangkok, Thailand, 11 – 15 March 2002

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

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

TABLE OF CONTENTS

PART I – HISTORY OF THE MEETING

1.   **Introduction**

1.1   The ninth meeting of the APANPIRG Communications, Navigation, Surveillance and Air Traffic Management, Implementation Co-ordination Sub-Group (CNS/ATM/IC/SG/9) was held at the ICAO Asia and Pacific Regional Office in Bangkok, Thailand from 11 to 15 March 2002.

2.   **Attendance**

2.1   The meeting was attended by 64 participants from 20 States and 3 International Organizations. A list of participants is provided at Attachment 1.

3   **Officers and Secretariat**

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

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

4.   **Language and Documentation**

4.1   The discussions were conducted in English. Documentation was issued in English with a total of 14 Working Papers, 30 Information Papers and 1 Flimsy being considered by the meeting. A list of papers presented during the meeting is included in Attachment 2 to this report.

5.   **Opening of the Meeting**

5.1   In opening the meeting Mr. L.B. Shah welcomed Mr. H.S. Kola, Chairperson of APANPIRG and leader of the Indian delegation, as well as other participants to Bangkok. Mr. Shah emphasised the need for the CNS/ATM/IC Sub-Group to continually evaluate events that were happening in the international aviation arena to ensure that the Asia/Pacific region remained at the forefront of these developments. The region had been recognised by the ICAO Council as a pioneer in many areas of CNS/ATM implementation. While there had been a significant decrease in air traffic in the region following the tragic events of "September 11" there were indications that there would be an increase in airline schedules for the coming northern hemisphere summer. This would result in the ongoing need for States to continue with their plans to implement new and improved CNS/ATM systems sooner rather than later. The ICAO Council had suggested that Regional Offices and their associated working organisation keep CNS/ATM implementation as a high priority and establish time lines for implementation.

5.2   Mr. Shah reminded the meeting that APANPIRG/12 had reviewed the Sub-Group's Terms of Reference and rescheduled the meeting to take place prior to the other two Sub-Groups. This review envisaged the Sub-Group developing appropriate guidance material for the region in the three specific areas, namely business case studies, addressing environmental issues and a framework

for regional training.   Mr Shah stressed that while the Region has been recognised for its achievements there was an on going need to determine what is to be carried out and how, where and when the developments in CNS/ATM are to be achieved.

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

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

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

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

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

6.2   **List of Draft Conclusions**

Draft Conclusion 9/1   –   Asia/Pacific Regional Plan for the New CNS/ATM
                           Systems

Draft Conclusion 9/3   –   Selection of GPS receiver standard for GNSS
                           implementation

Draft Conclusion 9/4   –   Selection of ADS-B data link

Draft Conclusion 9/7   –   Creation of a web-site for CNS/ATM Environmental Issues

6.3   **List of Draft Decisions**

Draft Decision 9/2   –   Modification to the CNS/ATM Implementation Matrix

Draft Decision 9/5   –   Amendment to the key priorities for implementation of the
                         CNS/ATM systems for the Asia/Pacific region

6.4   **List of Decision**

Decision 9/6   –   Environmental Benefits of CNS/ATM Systems

PART II – REPORT ON AGENDA ITEMS

Agenda Item 1:   Adoption of Provisional Agenda

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

Agenda Item 1:   Adoption of Provisional Agenda

Agenda Item 2:   Review and update the Asia/Pacific Regional Plan for the New CNS/ATM Systems

Agenda Item 3:   Review developments, research, trials and demonstrations concerning implementation of CNS/ATM systems and develop guidance material as appropriate

Agenda Item 4:   Review and identify key priorities for implementation of CNS/ATM systems for the Asia/Pacific Region

Agenda Item 5:   Review and identify intra and inter-regional co-ordination matters

Agenda Item 6:   Review the establishment of an airspace safety monitoring organization and structure for the Asia/Pacific Region

Agenda Item 7:   Review business planning initiatives and applications for the implementation of CNS/ATM systems within the Asia/Pacific Region

Agenda Item 8:   Review and identify deficiencies in the air navigation field

Agenda Item 9:   Review the outcome of the 38th Conference of the Directors General of Civil Aviation Asia/Pacific Regions related to CNS/ATM systems

Agenda Item 10:   Consider environmental issues related to implementation of CNS/ATM systems

Agenda Item 11:   Review the development of the ICAO ATM Operational Concept and develop guidance material as appropriate

Agenda Item 12:   Develop a framework for regional training plans for CNS/ATM systems

Agenda Item 13:   Review the APANPIRG/12 Report and subsequent ANC/Council Actions with respect to CNS/ATM issues

Agenda Item 14:   Develop and propose to APANPIRG an appropriate future work programme

Agenda Item 15:   Any other business

Agenda Item 16:   Propose date and venue of the next meeting

Agenda Item 2: Review and update the Asia/Pacific Regional Plan for the New CNS/ATM Systems

2.1   **Asia/Pacific Regional Plan for the New CNS/ATM Systems – Draft Issue 6**

2.1.1   The meeting reviewed the Asia/Pacific Regional Plan for the New CNS/ATM Systems – Draft Issue 6 and noted that there were several editorial corrections required to align the Regional Plan with the Global CNS/ATM Plan. The meeting was advised that the secretariat would undertake this extensive work and distribute a revised Draft Issue 6 of the plan to States and International Organizations on completion.

2.1.2   The meeting noted that there were some changes by States to the timelines within the plan. These would be reflected in the revised Draft Issue 6 to the Plan. The meeting formulated the following draft conclusion:

Draft Conclusion 9/1 – Asia/Pacific Regional Plan for the New CNS/ATM Systems

That, the updated Asia/Pacific Regional Plan for the New CNS/ATM Systems be adopted and circulated for use by States and International Organizations.

Agenda Item 3:   Review developments, research, trials and demonstrations concerning implementation of CNS/ATM systems and develop guidance material as appropriate

3.1   **CNS/ATM Implementation Planning Matrix**

3.1.1   The meeting reviewed the draft CNS/ATM implementation matrix prepared in accordance with Conclusion 11/37 of APANPIRG/11 meeting. The matrix contained the implementation status of CNS elements such as ATN, AIDC, CPDLC, GNSS and ADS. The matrix was expected to be reviewed by APANPIRG and its Sub-Groups on a regular basis to assess progress of implementation. The matrix would be further developed progressively to include implementation status of major CNS/ATM elements covering all ASIA/PAC FIRs.

3.1.2   It was noted that GPS NPA was implemented at various airports in the Federated States of Micronesia with the assistance of US. FAA. It was agreed that the Secretariat would collect details and include them in the matrix.

3.1.3   The meeting reviewed and updated information in the Matrix provided in Appendix A to the report on Agenda Item 3. While reviewing the matrix, the meeting considered the need to include SBAS and GBAS and split the ADS column into two to indicate ADS-C and ADS-B separately. It was also recognized that the status, such as trial or demonstration or operational use should be reflected including the name of location where such facilities are provided. In view of the foregoing, the meeting formulated the following Draft Decision.

Draft Decision 9/2   –   Modification to the CNS/ATM Implementation Matrix

That, the CNS/ATM Implementation Planning Matrix in Appendix A to the Report on Agenda Item 3 be modified to include SBAS and GBAS. The ADS column will be split into two for ADS-C and ADS-B to indicate implementation status separately.

3.2   **Regional GPS Measurement Campaign**

3.2.1   In accordance with Conclusion 11/20 of APANPIRG/11, the GPS measurement campaign was co-ordinated by Singapore to determine normal and peak excursion of GPS performance. The measurement was conducted on 11 and 25 September and 9 October 2001 and involved participation by Australia, China, India, Singapore and USA.

3.2.2   The data collected indicated that the horizontal and vertical errors were less than 5 meters at all locations except for New Delhi. The Position Dilution of Precision (PDOP), Horizontal Dilution of Precision (HDOP) and Vertical Dilution of Precision (VDOP) were found to be low, being less than 2 meter. The mean horizontal and vertical errors measured were also found to be low. These measurements further confirmed that the removal of Selective Availability (SA) in May 2000 had significantly improved the accuracy of GPS positions.

3.2.3   It was, however, noted that the DOP errors measured were not considered as representation of regional annual DOP errors since seasonal effect had not been accounted for. In addition, the measurement period may not be the period when highest regional ionospheric activities occurred.

3.2.4   The meeting expressed appreciation to Singapore and all the participating States for successfully completing the task.

3.3   **Ultra Wideband (UWB) Technology**

3.3.1   The United States informed the meeting of potential interference problem to the radio navigation systems. The GPS was among the systems that have been analyzed and tested to determine potential for interference. It was suggested that the civil aviation authorities should study and examine whether UWB technology will cause interference to aeronautical safety system.

3.4   **US Satellite Navigation Programme Status**

3.4.1   The United States provided an update on the United States FAA GPS augmentation programmes. One of the main GPS modernization programmes is the addition of two new civil navigation signals in addition to the existing L1 signal. It was stated that the second frequency L2 will be available in 2003. The new L5 signal will be available for initial operating capability within 2012-2013 time frame. The benefit of L5 includes more precise navigation worldwide, increase availability of precision navigation operation in certain areas of the world and interference mitigation. The other aspect of GPS modernization is discontinuation of Selective Availability (SA) in 1 May 2000 which has enhanced GPS accuracy for civilian use.

3.5   **Wide Area Augmentation System (WAAS)**

3.5.1   It was stated that the FAA announced in August 2000 that WAAS signal in space was available for aviation users to increase situational awareness during VFR flights, as well as for non-aviation users requiring precise positioning and time. WAAS has been broadcasting continuously 24-7 since then. It was further stated that the initial operating capacity for Lateral Navigation/Vertical Navigation (LNAV/VNAV) for WAAS would be available in December 2003 or even earlier in September/October.

3.6   **Local Area Augmentation System (LAAS)**

3.6.1   LAAS is a second augmentation to GPS signal that will complement the WAAS in U.S. airspace to provide a full satellite-based approach and landing capability for all phases of flight. An initial Category I public use LAAS system would be available in 2004 and Category II and III systems will be available in the 2006-2007 time frame. FAA expects full LAAS development to be completed by 2010. The latest programme information on both WAAS and LAAS system can be found in FAA website at http://gps.faa.gov

3.7   **Comparative Analysis of Regional Developments in the Air Navigation Field**

3.7.1   The matrix on the comparative analysis of regional developments in the air navigation filed presented to the ICAO Council was noted by the meeting. The matrix was developed to provide a snapshot comparative analysis of regional developments and to enhance the planning and implementation of a cohesive, global air navigation infrastructure of facilities and services. It was expected that the CNS/ATM Implementation Matrix developed by APANPIRG would provide significant input to the matrix on regional developments as this task was going to be an ongoing exercise to review implementation.

3.8   **World Radiocommunication Conference 2003 (WRC-2003)**

3.8.1   The United States presented an information paper on the radio spectrum issues of critical importance to civil aviation. The paper presented a draft proposals developed by USA for Resolution 605 and 606 of WRC-2000 to be considered under WRC-2003 agenda item 1.15. The proposals identify the need to provide protection to the existing aeronautical services by means other than specifying the Power Flux Density (pfd) value for Radio Navigation Satellite Service (RNSS).

3.8.2   The meeting noted the ICAO position in this regard which, supports the need to specify pfd limits for RNSS as a protection for DME in the band 1 164 – 1 215 MHz and primary radar in the band 1 215 – 1 300 MHz. It was further noted that the detailed study is going on in the ICAO GNSS Panel and AMC Panel as well as at ITU to determine specific pfd limits for RNSS.

3.8.3   It was also noted that the United States is proposing a footnote in the relevant part of ITU Radio Regulation to permit the use of the band 108 – 117.975 MHz, on a worldwide basis for transmission of differential correction signals for GBAS. In this regard, the meeting noted that ICAO position on WRC agenda item 1.28 supports regulatory changes to permit introduction of GBAS including the surveillance system (VDL Mode 4) in the band 108 – 117.975 MHz.

3.8.4   The United States pointed out that States should also be aware of the need to protect primary radar in the band 2 700 – 2 900 MHz by opposing any proposal for a new allocation to the mobile service in that as stated in ICAO position for WRC-2003 agenda item 1.22.

3.8.5   With regard to the preparation for WRC-2003 it was noted that the Regional Office had presented ICAO position for WRC-2003 at the First and Second APT Preparatory Group Meeting for WRC-2003 in September 2000 and June 2001. A list of designated contact points responsible for preparation for WRC-2003 in each civil aviation administration was prepared.

3.8.6   A regional preparatory group meeting for WRC-2003 was held from 15-16 November 2001 in conjunction with AMCP WG-F Meeting held in Bangkok from 19 to 27 November 2001. Both meetings were held in Bangkok to provide opportunity to the designated contact points to be thoroughly familiar with ICAO position on relevant WRC-2003 agenda items. States were provided with a list of designated contact points in their respective telecommunication regulatory authorities to facilitate coordination. The APT meeting schedule for WRC-2003 was also forwarded to States. The Third APT Preparatory Group meeting will be held in Thailand from 10-15 June 2002 and the Fourth Meeting will be held in Pusan, Republic of Korea from 2 to 7 September 2002.

3.8.7   States were encouraged to attend the APT Preparatory Group Meetings to protect aviation interest. In order to make a concerted effort, the Secretariat will carry out consultation with aviation representatives before the APT meeting to develop a strategy in dealing with relevant agenda items at various working parties and working groups established by the APT meeting.

3.9   **GNSS Implementation Team (GIT)**

3.9.1   The United States presented an information paper outlining the activities of the Satellite Navigation and Communication (SN & C) Advisory Committee of the Transportation Working Group of Asia Pacific Economic Co-operation (APEC) in promoting implementation of GNSS in the ASIA/PAC region.

3.9.2   It was noted that regional meetings were held at four different locations to discuss implementation of regional Satellite Based System Test Bed in Asia. A GNSS Implementation Team (GIT) meeting was held from 26 February to 1 March 2002 which developed GIT goals and objective, terms of reference and work programme that will facilitate the implementation of GNSS.

3.9.3   The GIT meeting was attended by representatives from APEC, ICAO and IATA. The GIT activities will not duplicate with ICAO activities. It would rather foster implementation of ICAO strategy and the ICAO regional plan. This is ensured by close co-ordination and attendance at APEC GIT meetings by ICAO.

3.9.4   In order to seek support from all APEC Economies for implementation of SBAS and GBAS including regional augmentation system, a draft statement was also developed for adoption by APEC Transport Ministers.

3.10   **Selection of GPS Receiver Standard for GNSS Implementation**

3.10.1   The meeting noted that for the selection of GPS receiver for the introduction of GPS based GNSS IFR procedures it is necessary for a State to first select the GPS receiver standard on which the operational rules and procedures will be based. At present there is effectively only two such standards available. These are the US FAA TSO C129 and the TSO C145/146 – with the C146 standard being for stand alone receivers. The C129 receiver has been available since the early 1990s. While the C145/146 standard has been released at present there are no commercially available receivers certified to this standard. Indications are that these will be available in 2002.

3.10.2   TSO C129 standard is titled "Supplementary Means…." and was developed in the early 1990s to allow GPS to be used in conjunction with other conventional ground based aids such as NDB and VOR/DME. Its limitations include having Selective Availability (SA) being always assumed to be on and a RAIM algorithm that has fault detection (FD) only. Depending on the class of this receiver it has been approved for en-route and non-precision approach (NPA) use. With some technical additions, and in a dual fitment, this standard is available for primary means oceanic use. The availability for use, particularly for NPAs, is limited by the GPS constellation and the constraints of using SA on for the availability assessments.

3.10.3   TSO C145/146, later generation 'primary means' standard was developed primarily for use with SBAS augmentation systems but does not require those systems to be operational. The standard includes "SA off" operations, a fault detection and exclusion mode (FDE) and better human factors integration. It has the ability to use the augmentation signals from SBAS systems as well as the ranging signal from those satellites. For this reason the availability for enroute, terminal and, in particular, NPA use, is much higher than the C129 receiver.

3.10.4   The IFR GPS approvals adopted by states in the mid 1990s were all based on the C129 receiver standard and consequently are limited by the design of that receiver. This means that if a GPS satellite failure occurs, as did to SVN 22 in mid 2001, the C129 receivers are unable to provide any navigation until that fault is rectified. As stated in the latest GPS signal performance specification (SPS) these failures may occur $1x10^{-4}$/hr/sv and last for up to 8 hours rendering GPS navigation, with a C129 receiver, unusable.

3.10.5   With approvals based on the C145/146 standard this type of failure is isolated by the FDE functionality of the receiver and the user is unaware of the problem and can continue to navigate. In addition, if SBAS ranging and augmentation signals are available, the receiver will use these to provide far higher levels of availability and accuracy. This standard will allow the development of operational use approvals that allow operations without conventional navigation aid carriage.

3.10.6   Most 'third generation' C129 receivers now on the market have a significant proportion of the C145/146 functionality built in. However they are only certified to the C129 standard so the benefits of this functionality cannot be utilized operationally. To achieve these benefits will require the replacement or upgrading of the C129 receivers.

3.10.7   It was noted that for States who are planning to implement GPS based IFR operations, there are significant operational and cost benefits in basing the approvals for these operations on the C145/146 standard rather than the C129 standard. For states that already have C129 approvals in place, the C145/146 equipment can utilize the instrument approach designs. Adoption of

the C145/146 receiver standard will provide additional operational benefits; however there will be a significant cost to already equipped operators to upgrade their aircraft fitments. In view of the foregoing the meeting formulated the following draft conclusion.

Draft Conclusion 9/3   -   Selection of GPS receiver standard for GNSS implementation

That States,

a)   should give consideration for future GNSS operational approvals and associated operational implementation based on the TSO C145/146 receiver standards; and

b)   use of TSO C129 remains a valid standard but should not be considered as the basis for future implementation of GNSS.

3.11   Airservices Australia Operational Deployment of an ADS-B System

3.11.1   The meeting noted that Airservices Australia has initiated a project to conduct an operational trial of ADS-B for ATC surveillance in a region near Bundaberg Queensland. The project will install a single ADS-B ground station, equip a number of aircraft with ADS-B avionics, and modify an operational air traffic management system to process and display ADS-B tracks.

The objectives of the trial were:

a)   To provide and demonstrate operational benefits to airline and airspace users in the selected area. Airservices has the objective of using ADS-B tracks to separate aircraft. Data collection and operational validation will occur and new radar like separation standards will be produced before the system is used to separate aircraft.

b)   To provide first hand operational experience of ADS-B for ATC surveillance in the Australian environment including the development of procedures and training.

c)   To provide cost-benefit information and practical information before wide scale deployment of ADS-B for radar like surveillance within Australia is considered.

d)   The schedule for the project is engineering readiness late 2002 and operational use early 2003.

3.12   ADS-B Fitment Cost versus Cost of New Radars

3.12.1   Whilst most interest regarding ADS-B centres on new operational concepts (e.g. CDTI), in some environments much may be gained through deployment of the most simple of the applications, namely radar like surveillance.

3.12.2   Document RTCA DO-242 defines a number of classes of ADS-B subsystems for aircraft, vehicles and ground systems. There is much development activity underway on full capability interactive aircraft and vehicle systems (classes A0, A1, A2 and A3 in the DO-242 classification) and on advanced operational concepts which these systems permit.

3.12.3   It seems likely, however, that these full capability ADS-B systems will be too expensive for widespread fitment to the lower end of the general aviation population. For this market, a class B1 avionics system (broadcast only) should be considered. Benefits to ATC and to other users commence once aircraft broadcast their position.

3.12.4   If the total avionics price can be reduced to a low enough figure, it will be cost effective for many states to equip large parts of their total national fleet of aircraft with ADS-B avionics and install ADS-B ground stations rather than installing, commissioning or refurbishing expensive radar ground stations. ADS-B ground stations are expected to cost 5 to 20% of the cost of a radar. Before radars can be decommissioned, a substantial amount of the fleet, including general aviation would need to be equipped.

3.12.5   One possibility is the creation of a ModeA/C transponder unit that can additionally, only squitter DF=18. If such avionics unit were produced, including a suitable GPS engine inside the same unit, then an easy transition from SSR to ADS-B could result. Standards for such GPS engines do not yet exist, and consequently there are few (if any) suitable products currently in the marketplace.

3.12.6   Once sufficient aircraft are broadcasting their position, additional functionality including cockpit displays and other applications may become operationally and financially attractive to some airspace users.

3.12.7   In view of the above the meeting formulated the following draft Conclusion

              Draft Conclusion 9/4   -   Selection of ADS-B data link

              That, States be encouraged to finalize the choice of an ADS-B data link technology.

3.13   **Status of CNS/ATM Implementation**

3.13.1   The following updated information regarding CNS/ATM implementation activities were presented to the meeting.

                  China

                  NESATC project

3.13.2   The project called North, East and South ATC (NESATC) will establish three major ATC centers in Beijing, Shanghai and Guangzhou, commonly known as the big triangle area of China. The project will build a same standard, reliable and modernized ATCC with integrated CNS/ATM systems' functions. The project, which commenced in 2000, will take about three years to complete.

                  Air-Ground VHF data link network application

3.13.3   The network is consisted of one network management data process system (NMDPS) and 80 RGS stations, which have been operational since August 2001. The airworthiness regulator issued a requirement to Airlines in China to have their aircraft equipped with data link capability not later than 1 January 2005. A FANS ground workstation installed at Harbin in North East China is ready to provide services for the Polar routes. D-ATIS trials in Beijing airport have also been conducted.

CARSNIMS Phase 2

3.13.4   The second phase of China Air-route Navigation Initial Monitor System (CARSNIMS) project was started in the end of 2000. It has provided data for the GPS joint measurement campaign. The feasibility study and preliminary design for the China Satellite Navigation Test Bed (CSTB) will be conducted in the second half of 2002. Provision of integrity signal to en-route ATCCs for reference and decision-making is also being considered.

Communication modernization project

3.13.5   A feasibility study on the aeronautical telecommunication was completed and system design is being conducted. The communication infrastructure will be upgraded to ATN SARPs based infrastructure. It is expected to have the nation-wide backbone to be established by the end of year 2004 will meet the NESATC project needs and other applications such as ATN trials.

Hong Kong, China

3.13.6   Trials on the following CNS/ATM system elements had been conducted by CAD, Hong Kong China with particular attention paid to the characteristics of dense air traffic, hilly terrain, and vast airspace over waters:

a)   D - ATIS/D -VOLMET and PDC via data-link;
b)   ADS/CPDLC trials with different type of aircraft including B747, B777 and A340. Downlink of meteorological data for processing by the ground computer systems was also conduced;
c)   ATN/AMHS trials had been conducted with Thailand, Japan and Australia;
d)   GNSS En-route applications;
e)   SATCOM;
f)   AIDC technical trial was conducted with Guanghzou;
g)   ATM functions including MSAW, conflict alerts for both Approach and En-route and Flow Control Management.

3.13.7   Positive feedback was received on the trials for D-ATIS/D-VOLMET and PDC via data-link which confirmed they can offer added operational and/or safety benefits including reduction of workload for pilots and controllers, greater data integrity, less time and coverage limitation for pilots to obtain the ATIS/VOLMET information, reduction in radio channel congestion for PDC delivery and enhanced flight efficiency and safety. More than 30 airlines are using the D-ATIS/D-VOLMET service with average monthly requests now about 4,900 since it became operational in April 2001. PDC service via data-link was put into operational use in December 2001. More than 35% of PDC are delivered via data-link to airlines including Cathay Pacific, Dragonair, Air Hong Kong, Lufthansa, Qantas etc. Further trials are considered including SMGCS, VDL Mode2 and SSR Mode S data-link etc.

ATN Trials Hong Kong, China

3.13.8   Hong Kong China informed the meeting that preliminary ATN trials with adjacent ATS authorities had been conducted since October 2000. The aims of the trials were on connectivity, integrity, functionality and interoperability of the ground-to-ground routers and AFTN/AMHS gateway systems. Emphases were placed on messages transit time, error rate, system reliability and alternate routing capability under different network configurations. The trials conducted between Hong Kong China and adjacent ATS authorities were as follows: October 2000- July 2001 with Bangkok on ATN; July 2001 with Tokyo on ATN/AMHS; August – November 2001 with Canberra on ATN/AMHS and November 2001 onward with Bangkok on further ATN technical trial. The

results indicated that the longest average message transit time was 13 seconds better than the typical delivery times of 1 and 2 minutes respectively for the current Hong Kong/Tokyo (9600bps) and Hong Kong/Bangkok (2400 bps) AFTN circuits. The problems encountered during the trials were found mainly due to the inter-networking protocols of IS-IS and ES-IS, which is not clearly defined in the present ICAO ATN technical specifications. It was suggested that the technical specification be fine-tuned to define more precisely parameters. The meeting appreciated the experience gained by Hong Kong China in conducting the ATN trials and suggested that the paper be presented to the next ATN Transition Task Force meeting to be held in April 2002.

<u>Fiji</u>

EUROCAT 2000X ATM Oceanic System

3.13.9   The Eurocat 2000X ATM Oceanic system was commissioned on 28 December 2001 at the new ATM centre next to Nadi Air Traffic Control Tower. Functionality includes FDP, Conflict Probe, ADS, CPDLC, Electronic strips, Air Situation Display, etc.

3.13.10   Safety Case(s), Safety Management Plan, etc. were developed as part of the overall Safety Management System of the Eurocat implementation.

ATS Disaster Recovery/Contingency Plan

3.13.11   The new ATS Disaster Recovery/Contingency Plan for Operations in the Nadi FIR caters for short-term outages, medium and extended outages. Backup procedures include use of HF, procedural system, reclassification of Oceanic Airspace and procedures for TIBA and Y2K routings.

Message Switching System and ATN Trials

3.13.12   A Unified Message Switching System (UMSS) was commissioned at the new ATM Centre in August 2001. The system is performing very well. The voice and data circuit between Fiji and USA will be upgraded to 64Kbps to cater for existing AFTN requirements and also planned testing on ATN. New Zealand and Australia AFTN circuits currently using existing voice and data links (NZ AFTN circuit is X.25 @ 2.4Kbps; Australia AFTN circuit is X.25 @ 4.8Kbps).

3.13.13   ATN tests being planned in 2002/2003 for implementation of ATN BIS router in 2005. Routers and gateways will be used for AMHS/ATN testing.

3.13.14   Limited AIDC tests conducted in September 2001 with Australia and more tests to be conducted. Also tests with NZ and USA are currently being planned.

RNP10 and GNSS Operations

3.13.15   Planning and consultation is being carried out with industry for RNP10 (50/50NM) implementation (in June 2002) in the Nadi FIR.

3.13.16   Additional NPA procedures for GNSS based operations will be developed and implemented by end of 2002.

ADS-B

3.13.17   A study is currently being conducted to provide a Cost Benefit Analysis on the implementation of ADS-B in Fiji. Trials are planned for 2003 and implementation in 2004.

ADS-C/ADS-B in Mongolia

3.13.18   Mongolia informed the meeting of a successful combined ADS-C/ADS-B demonstration conducted in Ulaanbaatar from 25 to 26 September 2001. The demonstration consisted of an MIAT AN-24 aircraft equipped with ADS-B avionics + CDTI and one Mil-8 helicopter with ADS-B avionics, one airport vehicle with ADS-B unit and ADS-B ground station with ADS-B, FIS-B and DGNSS functions. ICAO standardized technology VDL Mode 4 was employed for the demonstration.   ADS is seen as having great potential for Mongolia for reducing infrastructure costs, as Mongolia has no civil radars but a modern ATC system and supporting infrastructure. No communications service charges for ADS-B will be required as its signal and data of ADS-B can be processed locally. The current ATM automation system (AutoTrac 2100) was capable of integrating ADS-B information with ADS-C data.

Recent CNS/ATM Activities in Japan

3.13.19   Japan provided information on the recent CNS/ATM activities in Japan. Japan Civil Aviation Bureau (JCAB) introduced data link and satellite technology. JCAB modernized airports and air navigation systems in accordance with development plan for every five years starting 1967 in order to cope up with traffic demands. JCAB expanded their air navigation systems including FDP, RDP. JCAB is developing a new plan to promote implementation of the CNS/ATM system which would commence immediately upon completion of the seventh plan in March 2003. The MTSAT project is the core element of the new plan. JCAB is conducting MSAS flight tests. The interim analysis showed very high accuracy. It was stated that MTSAT will be launched in summer of 2003 and AMSS function will be in operation in 2004 and MSAS will be available in 2005.

CNS/ATM in Nepal

3.13.20   Nepal presented an information paper outlining details of existing and future CNS/ATM systems. It was stated that AFTN COM Centre is equipped with fully automatic message switching system and linked to Beijing via VSAT and Mumbai via terrestrial landline. Requirements for direct speech circuit with Lasha is implemented using VSAT. IDD hotline is used for ATS speech circuit with Kolkata, Delhi and Varanasi which will be upgraded to VSAT link in future. A network of 18 NDB, 6VORs, 7DMEs and five locator beacons are maintained. A PSR/SSR has been provided since September 1998 for approach control. CNS/ATM implementation plan has been prepared for implementation in three phases. WGS 84 surveys have been completed and incorporated in AIP Nepal. Priority has been given to the implementation of GPS based navigation throughout the country for en-route and non-precision approaches. GPS departure procedures for six airports are being developed. Details of the strategies for enhancement of ATM, ASM and surveillance functions have been adopted.

CNS/ATM Implementation in Philippines

3.13.21   The Master Plan for CNS/ATM systems completed in March 2000 identified high priority CNS/ATM elements requiring immediate implementation. The new CNS/ATM Systems Development Project was formulated; the detailed design stage of which will commence in May 2002 and the project completion is expected in the 2007.   The ATM automation system would be an integrated system consisting of Air Traffic Management Functions, Safety Measure Function, Weather information functions, ATM data recording and Controller's training functions.

Communication/Navigation/Surveillance

3.13.22   The communications system includes one ATN System in Manila ATM Centre, one set of Voice Switching and Control System (VSCS), D-ATIS, AMHS, VHF RCAG facilities and 26

VSAT remote stations with VSAT hub station at Manila. The navigation system would utilize SBAS and GBAS while the surveillance system would utilize ADS and three new SSR radars.   Two Ground Monitor Stations (GMS) for using SBAS will be installed and one GBAS will be installed at NAIA for Category I precision approaches. A consolidated ADS function will be intergraded in the ATM Automation System.

3.14   **ATN Planning Document**

3.14.1   It was informed that a set of the ATN Regional Planning Documents was forwarded to States in the ASIA/PAC and adjacent regions on 20 February 2002 in accordance with Conclusion 12/13 –Regional ATN Planning Documents and Conclusion 12/14 – ATN Transition Plan of the Twelfth Meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/12. These Documents provide necessary guidance to States in planning transition to ATN. These ATN Regional Planning Documents were developed by ATN Transition Task Force and they include the following:

> a) ASIA/PAC Regional ATN Transition Plan;
> b) ASIA/PAC Routing Architecture Plan;
> c) ASIA/PAC ATN Network Service Access Point (NSAP) Addressing Plan;
> d) ASIA/PAC ATN NSAP Address Registration Form; and
> e) ASIA/PAC ATS Message Handling System (AMHS) Naming Plan.

3.14.2   In accordance with the transition plan, the target date for regional implementation of ATN ground infrastructure is 2005 and States were requested to develop their own implementation programs.

3.15   **ICAO policies and practices related to CNS/ATM systems**

3.15.1   The meeting was informed that the 33rd Session of the ICAO Assembly held in Montreal, Canada from 25th September to 5th October 2001 adopted the Resolution A33-15 – Consolidated statement of continuing ICAO policies and practices related to Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) Systems. The adopted consolidated statement was presented to the meeting for information.

3.16   **ASIA/PAC ATN Routing Policy**

3.16.1   USA presented the meeting a draft ASIA/PAC ATN Routing Policy (IDRP) which was developed by Aeronautical Telecommunication Network (ATN) Transition Task Force, Working Group B. The States involved with Working Group B are Australia, Fiji, Hong Kong China, Japan, Singapore, Thailand and the United States. The routing policy outlines the requirements for backbone routers to support inter-regional, intra-regional and local connectivity. It provides global policy for the Aeronautical Telecommunication Network (ATN) routers operating in the Asia/Pacific Region in support of Air Traffic Services Message Handling Services (ATSMHS) and other ATN services. The ATN routing policy is very critical because States need to plan their resources to support the entire region. The document will be presented for further review to ATN Transition Task Force meeting to be held in Mumbai in April 2002. It was emphasized that the benefits of ATN can only be realized if each State participates in the implementation of the ATN transition plan.

                    ATN Trial USA – Japan

3.16.2   The United States informed the meeting that Federal Aviation Administration (FAA) and Japanese Civil Aviation Bureau (JCAB) had mutually agreed to test and implement Ground-to-Ground Aeronautical Telecommunication Network (ATN) service including AMHS and Boundary

Intermediate System (BIS) router.   The goals of the agreement were to synchronize AMHS service between both States and development of regional router and AMHS functional and performance characteristics. The first test was conducted in September 2000 with focus on ATN BIS router connectivity testing. The second test focused on AMHS compatibility. The final AMHS test was successfully conducted in November 2001. All tests were conducted in accordance with the "Pre-test of AMHS Connection and AMHS Connectivity Confirmation Test Procedures Document", in which the hardware and software configurations used for the testing were specified. The type of messages tested included the maximum length of messages sent and received during the trails.

a) AMHS messages converted from ATN
b) Receipt notices (RN) converted from AFTN acknowledgement messages
c) Non-delivery Reports (NDR) converted from unknown address AFTN service messages

3.16.3   Initial AMHS service between FAA and JCAB to replace current AFTN is scheduled in September 2003.

3.16.4   With regard to future ATN trials, it was agreed that the ICAO Secretariat would co-ordinate further trials between interested States through the ATN Transition Task Force.

3.17   **US. FAA Safe Flight 21 Program Status**

3.17.1   The United States informed the meeting the status of Safe Flight 21 Program. In 2001, the Safe Flight 21 program conducted an air traffic modernization forum in Memphis, Tennessee to demonstrate newly installed multilateration surveillance capabilities and the use of on-board moving map displays for monitoring surface aircraft and vehicle movement. In 2002, the multilateration system will be installed at Louisville, Kentucky, and a new automation platform for that facility to support on-going ADS-B test and evaluation efforts will be procured. In 2002, Alaska will complete installation of remaining ground transceivers, weather systems, and ADS-B avionics in the Bethel area, and continue to provide ADS-B "radar-like services. Approximately 200 commercial service airplanes and helicopters operating in the Alaska area will be equipped with the upgraded ADS-B systems. The more detailed information regarding the programme can be found at the FAA's Safe Flight 21 websites:

http://www.faa.gov/safeflight21 and
http://www.alaska.faa.gov/capstone

3.17.2   Expected benefits of ADS-B includes: increased access to airspace, increased arrival and departure rates, reduced flight delays and distances flown, increased predictability of flight times and distances flown, reduced deviations from the intended route, and increased flexibility in the routes flown and increased safety. ADS-B can provide additional surveillance coverage and fill gaps in radar coverage. Successful Safe Flight 21 demonstrations, coupled with supporting analyses in the areas of business case, safety and risk will be used to determine if these applications should be made operational.

3.18   **VHF Radio Interference Problem**

3.18.1   The United States informed the meeting that the critical air traffic control communications frequency operated around 134.000 MHz had experienced several cases of interference caused by unauthorized use of "high power cordless telephones". It has been determined that the cause of this interference is the illegal use of "high power cordless telephones" imported to the United States for sale. Such telephones are advertised with a range of up to 50 kilometres at power levels as high as 30 watts. It was noted that unauthorized use of an aeronautical band posed a safety

threat to international civil aviation and should be curbed. This issue was also discussed at the 33rd ICAO Assembly. It was agreed that the contracting States should be vigilant regarding the new source of radio frequency interference and notify ICAO accordingly. It was informed by the Secretariat that such frequency interference had been brought to attention of the concerned States in the region. Most of the national radio regulatory authorities were also informed of this new source of radio frequency interference and its potential impact on aviation safety.

3.19 **Lateral offsets in the South Pacific**

3.19.1 The meeting was informed that the application of lateral offsets was a topic that was considered at the recent Informal South Pacific ATS Coordination Group meeting (ISPACG/16) held in Tahiti in February 2002. Notwithstanding the guidelines on the use of lateral offsets in oceanic or remote area airspace (refer ICAO State letter AN 13/11.6-00/96 3 November 2000), the ICAO Separation and Safety Panel (SASP) was concerned that pilots were applying offsets of different magnitudes (1, 2 and 3NM) and in different directions (left or right relative to the direction of flight) and that the practice might have a negative effect on safety.

3.19.2 As a result of these concerns, the SASP lateral offsets project team completed a further review of the guidelines and refined the wording in the material issued in late 2000 by the ICAO State Letter mentioned above. The latest draft of the State letter and guidelines developed by the project team were presented to the meeting for information.

3.19.3 The meeting was informed that the Air Navigation Commission had reviewed Decision 12/9 of APANPIRG/12 and had noted that the Separation and Airspace Safety Panel (SASP) were developing further guidance for the development of lateral offset procedures. The Air Navigation Commission also expressed the view, "that the development of lateral offset procedures for regional implementation should be in accordance with global guidelines to avoid a proliferation of procedures with potentially conflicting requirements."

3.19.4 This topic will be further discussed at ATS/AIS/SAR/SG/12 Meeting in June 2002.

3.20 **FMS Arrival Procedure Trial at Auckland International Airport**

3.20.1 An information paper provided by New Zealand outlined the results of the ongoing FMS trial at Auckland International Airport. The trial has proven that it is possible to design a safe and operationally acceptable arrival procedure based on a constant descent path concept. This type of procedure provides multiple benefits for the operators (time/fuel savings, flight planning), ATC (predictable aircraft tracking, traffic sequencing, reduced need for radar vectoring), community in general and the environment (reduced levels of noise and air pollution).

3.20.2 The trial has shown that it is possible to link such an arrival procedure to an existing ILS procedure, even at shorter distances from landing THR than the minimum recommended by ICAO PANS-OPS. This is not, however, considered the optimal solution since the transition from LNAV/VNAV flight mode to the ILS approach mode happens during the critical turn onto the final. Ideally, this type of arrival will connect to an RNP Baro-VNAV approach allowing a continuous FMCS operation in LNAV/VNAV mode throughout the arrival and approach sequence.

3.20.3 While it is considered that to achieve the full benefits for ATC, this type of procedure will probably have to be complemented by an automated system of aircraft sequencing, capable of computing the ETA for each aircraft in real-time. Highly predictable arrival flight paths that also include speed constraints will make such automated systems not only viable but reliable as well.

3.20.4   This trial has been successful in providing a wealth of information about the operational aspects of the new arrival procedure concept. The Sub-Group encouraged New Zealand to continue with the trial and endeavours to increase both the numbers and types of aircraft and operators using the designed procedures and inform the Sub-Group of developments.

3.21   **Update on the regulatory reform program in the Civil Aviation Safety Authority, Australia**

3.21.1   Australia presented an update on the Regulatory Reform Program (RRP) within the Civil Aviation Safety Authority (CASA). The RRP was established under the auspices of the Minister for Transport and Regional Services, Charter Letter and Policy Statement on Aviation Reform, which called for the reform process to be conducted at a measured pace, with publicly defined goals and target deadlines. The objective of the RRP was to develop a complete suite of aviation regulations to replace those that currently existed, and to provide stakeholders with advance notice of the important regulatory reforms.

3.21.2   The meeting was advised that the primary purpose of the RRP is to produce Civil Aviation Safety Regulations (CASRs), that maintain or enhance safety and which are clear, concise and unambiguous. The focus would be on ensuring aviators can better understand the rules rather than simply underpinning enforcement.

3.21.3   It was considered that consultation with industry is a key-element of the rule making process, which comprised seven phases:

        a) initiation and planning;
        b) regulatory development;
        c) legal drafting;
        d) formal consultation including Notice of Proposed Rule Making (NPRM) and
            Summary of Responses (SOR);
        e) legislative approval;
        f) hand-over/implementation; and
        g) project closeout and review.

3.21.4   The meeting noted that generally, there are two forms of consultation:

        a) informal consultation through the issue of a Discussion Paper; and
        b) formal consultation through the issue of an NPRM.

3.21.5   The meeting was advised that the NPRM is CASA's preferred method of articulating the proposed rules for public comment and the public is notified through the media and CASA web-site.

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
AUSTRALIA	ATN tests were conducted. BIS Router and Backbone BIS Router will be implemented by 2004.	AFTN based AIDC Implemented between Brisbane and Auckland.	Implemented to support FANS1/A equipped aircraft.	Implemented (S) 260 GPS NPA Final 26 aerodromes to be completed 2002	Developed en-route as (P) for approval to use in domestic airspace.	ADS-C Implemented. ADS-B trial being conducted.	
BANGLADESH							
BHUTAN							
BRUNEI DARUSSALAM	Implementation of ATN BIS Router planned by 2005.		No CPDLC planned in view of full VHF coverage within their airspace.	NPA (S) planned for 2003.		No ADS planned due to complete Radar coverage.	
CAMBODIA							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
CHINA	ATN BIS Router will be implemented by 2005.	AIDC between ACCs within China are being implemented.	Implemented to support ATS Route L888 and polar routes. Trial on HF data link conducted for use in western China.		Implemented in certain airspace as (S).	Implemented to support L888 and polar routes.	
HONG KONG, CHINA	AMHS and BBIS Tests were conducted with Japan and Thailand for implementation in 2003.

Trial with Australia being conducted. | Trial with Guangzhou China commenced. Implementation planned for 2002/2003. | Trials continuing for CPDLC. D-ATIS D-VOLMET and PDC implemented.

VDL Mode-2 trial planned for 2002. | | Implemented in certain airspace as (S). | Trials continuing for ADS-C. | |
| **MACAO, CHINA** | | | | | | | |

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
COOK ISLANDS							
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA							
FIJI	ATN BIS Router will be implemented in 2005.	Trial planned implementation in 2004.	EUROCAT 2000 X system implemented for CPDLC.	NPA procedures for (S) to be completed in Dec. 2002.	Implemented as (S).	Implemented in oceanic airspace using EUROCAT 2000 X. ADS-B trials in 2002/2003. Implementation in 2004.	
FRANCE French Polynesia Tahiti		Implementation of limited message sets with adjacent centres under discussion.	Implemented since 1996.			Implemented since March 1999.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
INDIA	ATN BIS router and BBIS router planned for implemented at Mumbai in 2005.		Implemented at Kolkata and Chennai.			Implemented at Kolkata and Chennai.	
INDONESIA			CPDLC in Jakarta, Ujung Pandang FIRs planned for 2003.	Planned for implementation in 2002as (S).		70% of area covered by RADAR ADS trial planned for Jakarta and Ujung Pandang FIRs for 2003.	
JAPAN	AMHS and Router Tests are progressing with USA and Australia for implementation in 2005. ATN BBIS will be implemented in 2002.	AIDC based on AFTN procedure implemented with USA.	Implemented in Tokyo FIR.			Implemented in Tokyo FIR.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
KIRIBATI							
LAO PDR	ATN BIS Router planned for implementation with Bangkok in 2002.		Planned for Bay of Bengal and South China Sea areas. Equipment is under test operation.		Implemented as (S).	Planned for Bay of Bengal and South China Sea areas. Equipment under test operation.	
MALAYSIA	ATN BIS Router planned for 2005.		Planned for Bay of Bengal and South East Asia areas and the equipment is under test operation.			Planned for Bay of Bengal and South East Asia areas and equipment is under test operation.	
MALDIVES							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
MARSHALL ISLANDS				NPA (S) implemented at Majuro Atoll.			
MICRONESIA FEDERATED STATES OF							
Chuuk				NPA(S) implemented			
Kosrae				NPA(S) implemented			
Pohnpei				NPA(S) implemented			
Yap				NPA(S) implemented			

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
MONGOLIA	ATN BIS Router planned for 2005.		Function available. Regular trials are conducted.	GPS procedures are being developed.	Implemented as (P).	ADS-C implemented since August 1998. ADS-B trial in progress implementation planned for 2002/2003.	
MYANMAR							
NAURU							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
NEPAL				Development of arrival procedure and NPA as (S) completed end development of departure procedure is being develop.	Implemented as (S).		
NEW ZEALAND		Implemented between New Zealand and Australia. Tests with Fiji and USA being conducted.	Implemented			Implemented	
PAKISTAN	Implemented of ATN considered for Phase II (2005-2010).					RADAR coverage in Karachi and Lahore FIRs.	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
PAPUA NEW GUINEA							
PHILIPPINES	ATN BIS Router planned for 2005. Implementation for AMHS also planned.		D-ATIS and CPDLC Planned for 2006.			Planned for 2006.	
REPUBLIC OF KOREA							

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
SINGAPORE	ATN BIS Router planned for 2005.		Implemented since 1997. Integrated in the ATC system in 1999. D-ATIS implemented since February 2000.			Implemented since 1997. Integrated with ATC system in 1999.	
SRI LANKA	ATN BIS Router Planned for 2005.		CPDLC implemented since November 2000.	NPA (S) planned for 2003.		ADS implemented since November 2000.	GPS based domestic route structure being developed.
THAILAND	ATN G/G system implemented for domestic services. BBIS/BIS Routers planned for 2002. AMHS test with Hong Kong conducted.	Implemented in Domestic Sector.	Implemented		Implemented as (S).	Implemented	

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
TONGA							
UNITED STATES							
Anchorage			Implemented	NPA(S) implemented	En-route (P) implemented		
Fairbanks				NPA(S) implemented			
Guam (Agana NAS)				NPA(S) implemented			
Guam (Anderson)				NPA(S) implemented			
Honolulu Intl.			Implemented	NPA(S) implemented	En-route (P) implemented	ADS-C planned for Dec. 2004	
Johnston Atoll				NPA(S) implemented			
Kahului				NPA(S) implemented			
Los Angeles		Implemented using AFTN procedure. ATN AIDC planned for 2005.	Implemented 2001.	NPA (S) implemented	En-route (P) implemented	ADS-C planned for Dec. 2004.	
Saipan				NPA (S) implemented			

CNS/ATM Implementation Planning Matrix
Implementation Status of CNS Elements

State/Organization	ATN G/G Boundary Intermediate System (BIS) Router/AMHS	AIDC	CPDLC	GNSS		ADS	Remarks
				NPA Supplemental Means (S) Primary means (P)	En-route Supplemental Means (S) Primary means (P)		
VIETNAM	ATN BIS Router planned for 2005 and AMHS in 2005.		Planned for 2003 – 2005	Planned for NPA (S) for 2003-2005 period	Implemented as (S) planned for 2002	Most of air space in Hanoi and Ho-Chi-Minh FIRs covered by RADAR. ADS planned for 2003-2005.	

Agenda Item 4: Review and identify key priorities for implementation of CNS/ATM systems for the Asia/Pacific Region

4.1 The meeting reviewed the list of key priority for CNS/ATM implementation and updated the status based on the progress made.

ADS Broadcast (ADS-B)

4.2 The meeting received papers describing ADS-B activities in Australia, Mongolia and the United States. A common theme within the papers was the ability to obtain surveillance information from ADS-B at a much lower cost than with a conventional SSR station. The ADS-B also supports the provision of additional information direct to the pilot such as Cockpit Display of Traffic Information (CDTI).

4.3 It was noted that ICAO has formalised two ADS-B data links with SARPs in Annex 10 (Mode S Extended Squitter and VDL mode 4). There is a proposal to standardise a third data link (UAT). The three data links are not inter-operable.

4.4 Currently, Air Carrier Aircraft (30 passenger seats or more, 15,000Kg MTOW or more) are required to carry TCAS II. A TCAS II installation includes a Mode S Transponder. These transponders are configurable, with a software change and linking the aircraft navigation system, of providing the extended squitter transmission.

4.5 ICAO Annex 10 SARPs and RTCA DO-260 MOPS already define Mode S Extended Squitter (DF 17). Extended Squitter includes Aircraft:

      a) Flight ID;
      b) Position (Lat/Long) and FOM (Figure of Merit); and
      c) Pressure Altitude

4.6 In addition, aircraft transiting Asia to Europe will be required to interface the transponder to the navigation system to downlink similar information to meet the European requirement for downlink of aircraft parameters (DAPs). It would make economic and logistical sense to implement extended squitter DF17 capability at the same time as the DAPs hardware and software changes.

4.7 Airlines have commenced equipping their fleet with newer models of TCAS, which can display aircraft at ranges in excess of 100NM. This greatly increased detection range provides pilots with a much more comprehensive situational awareness. These new TCAS systems operate by listening to extended squitter from other aircraft and use the positional information contained these messages to display relative position. Until all aircraft are transmitting extended squitter, the value of Enhanced TCAS is reduced.

4.8 Transponder manufacturers have demonstrated Extended Squitter software upgrades to existing Mode S Transponders. At least one manufacturer has products available and installed in aircraft providing revenue service. Enabling of Extended Squitter in the existing aircraft fleet requires a software upgrade to the Transponder and wire connection between the Navigation System and the Transponder; to provide the position information.

4.9 The provision of Extended Squitter from aircraft already equipped with TCAS is expected to be inexpensive. This is totally consistent with the existing ICAO Annex 10 and the development path of Mode S and TCAS.

Key Priorities

4.10   Following the discussion on ADS-B, the meeting recognized the need to add ADS-D as a task in the key priorities list. Updated information and the new task are provided in Appendix A to the Report on Agenda Item 4.

4.11   In view of the above, the meeting formulated the following draft Decision.

**Draft Decision 9/5   –   Amendment to the key priorities for implementation of
the CNS/ATM systems for the Asia/Pacific region**

That, the amended list of key priorities for implementation of the CNS/ATM systems for the Asia/Pacific region provided in Appendix A to the Report on Agenda Item 4 be adopted.

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

No.	Key Priority	Description	Milestone	Sub-group	Status
1	ATN Transition	The development of an ATN transition plan is required.	2001	CNS/MET ATN Transition Task Force	Completed Completed development of the Plan
2	Incorporation of CNS/ATM Material into Regional ANP & FASID	To reflect regional agreement for the implementation of CNS/ATM facilities and services and the determination of priorities for financing.	APANPIRG/13	All	On-going CNS/MET SG/5 established Working Group to incorporate CNS/ATM materials in the Regional Procedure Part CNS FASID.
3	Revised South China Sea ATS Route Implementation	Successful implementation of this important route structure alleviates airspace congestion and provides a project model for similar route structure activity elsewhere in the Region.	1 November 2001	ATS/AIS/SAR	Implemented
4	WGS-84 Implementation	To achieve uniformity in aeronautical data publication across the Region in order to ensure a standard reference system for CNS/ATM.	Immediate (Effective Date was 1 Jan 1998)	ATS/AIS/SAR	Implementation is monitored at each meeting using the uniform format for the reporting of WGS-84 implementation. Report progress to APANPIRG/13.

No.	Key Priority	Description	Milestone	Sub-group	Status
5	RVSM Implementation	To provide more efficient flight profiles and to increase airspace capacity in conjunction with the implementation of CNS/ATM.	Phase 1: 21 Feb 2002 – Western Pacific/South China Sea Phase 2: 31 Oct 2002- Hong Kong FIR and Sanya AOR Vientiane, Hanoi, Jakarta, Ujung Pandang, Bali FIRs. Phase 3: 27 Nov 2003- Asia to Europe South of the Himalayas and beyond	ATS/AIS/SAR	Phased implementation. RVSM Implemented in the Pacific 24 Feb 2000.
6	RNP Implementation	Global standard for navigation is seen as a prerequisite for many CNS/ATM implementation activities.	RNP-10/South China Sea 2001. RNP-10/ Australia-Indonesia 29 Nov 2001 RNP-10/Bay of Bengal/Arabian Sea 28 Nov 2002	ATS/AIS/SAR & CNS/ATM/IC	Phased implementation. RNP-10 is implemented in NOPAC, CENPAC, CEP & Tasman Sea. Implemented

No.	Key Priority	Description	Milestone	Sub-group	Status
7	ADS	The implementation of ADS in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM.	APANPIRG/13	ATS/AIS/SAR	Phased implementation. Revised Regional CNS/ATM Guidance Material developed containing ADS section. Implementation focus and timetable need to be developed. States are gaining experience in the use of ADS.
8	Technical Co-operation in Regional CNS/ATM Planning & Implementation	The continuation and enhancement of ICAO's co-ordinating role of technical co-operation in CNS/ATM planning and implementation, in close co-operation with all partners and taking into account the regional approach, is required.	APANPIRG/13	All	Sub-groups to identify requirements.
9	Preparation for WRC2003	The co-operative participation of States is required with their respective communications authority, regional groups such as the APT and at the WRC, preparatory meetings and study groups to ensure that aviation spectrum requirements are fulfilled including GNSS spectrum requirements.	WRC2003	All	ICAO Position presented at APT meetings in Sept.2000 and June 2001. State letter issued to follow up APANPIRG Conclusion 11/24, Regional Preparatory Group Meeting for WRC-2003 was held in Bangkok from 15 to 16 November 2001 in conjunction with AMCP WG-F meeting held from 19 to 27 November 2001in Bangkok.

No.	Key Priority	Description	Milestone	Sub-group	Status
					States were encouraged to participate in the APT Meetings to be held from 10-15 June in Thailand and 2-7 September in Republic of Korea.
10	GNSS Implementation	To implement GNSS in accordance with the Asia Pacific Regional Strategy.	Phase 1- 2003	All	Phased implementation Sub-groups to develop plan and report progress to APANPIRG/13 GNSS Implementation Workshop was held in May 2001. • States are encouraged to implement GNSS for En-route and NPA functions. • States advised to participate in the GNSS Measurement Campaign and the result of the campaign presented to the CNS/ATM/IC/SG9. • GNSS Implementation checklist was developed and forwarded to States. • GNSS strategy was reviewed.
11	Airspace Management	To implement revised ATS route structures for the major traffic flows.	Phase 1: November 2001 Indonesia/ Australia	ATS/AIS/SAR CNS/MET	Phased implementation. Report progress to APANPIRG/13.

No.	Key Priority	Description	Milestone	Sub-group	Status
			Phase 2: Asia to Europe via South of the Himalayas, 28 Nov 2002		
12	Final phase of WAFS	To implement transition to the final phase of WAFS to support the CNS/ATM system.	2004	CNS/MET SG	• WAFS Transition Plan and Procedures has been developed and is being successfully implemented. • Transfer of responsibility of RAFCs to WAFCs London and Washington has been implemented. • Closure of RAFCs has been implemented.
13	MET Chapter 8 of the ASIA/PAC Regional Plan for New CNS/ATM System	To develop MET components of the ASIA/PAC CNS/ATM concept/strategy To develop MET Chapter of the Regional CNS/ATM Plan	2003 2004	CNS/MET with assistance of the ATS/AIS/SAR SG METATM TF	• The first draft of MET Chapter of the Regional CNS/ATM Plan has been developed. • METATM TF to develop MET components of the ASIA/PAC CNS/ATM concept/strategy.
14	Data – link Communications	1. Implementation of CPDLC (with HF and/or SATCOM back-up) in oceanic or remote airspace. 2. AIDC to be introduced where ATS automated systems are implemented.	2002 2005	All All	Sub – Groups to review progress of implementation. Implementation focus and time table need to be developed.

No.	Key Priority	Description	Milestone	Sub-group	Status
15	ADS-B	Validate the selection of an ADS-B link in the Asia/Pacific by conducting a cost benefit study including a) the cost impact on avionics of mandatory carriage of the ADS-B link selected b) identified and quantified specific benefits such as reduced separation standards, optimum altitude. c) conduct studies in the development of separation standards based on aircraft automatic position reports. d) determined a date for the mandatory carriage of the selected ADS-B link by aircraft in the Asia Pacific again. e) encourage standardization of the selected ADS-B link with transmit only systems that include integrated GPS capability.	APANPIRG/14	All ATS/AIS/SAR ATS/AIS/SAR CNS/MET	

Agenda Item 5:   Review and identify intra and inter-regional co-ordination matters

5.1   **EMARSSH implementation**

5.1.1   The meeting recalled that the revised ATS route structure – Asia to Middle East/Europe, South of the Himalayas (EMARSSH) Project had been recognized and endorsed by ICAO as a significant development in the interests of safety, efficiency and capacity enhancements, which had been endorsed by APANPIRG/11 and APANPIRG/12 (conclusions 11/10 and 12/5 respectively).

5.1.2   The meeting was advised that although the implementation date for EMARSSH was 28 November 2002, close regional cooperation between Australia, Indonesia, Malaysia and Singapore had facilitated the introduction of EMARSSH phase one on 29 November 2001, together with the introduction of RNP10 on designated routes in Oceanic airspace between Australia and Indonesia.

5.1.3   EMARSSH planning for the remaining routes between Asia, the Middle East and Europe was well developed, and the meeting noted the excellent level of cooperation and liaison between States, Military Authorities and industry in the development and implementation of EMARSSH.

5.2   **Dissemination of Aeronautical Information**

5.2.1   The meeting recognized the importance of accurate, timely and integrated dissemination of aeronautical information to the safe and successful implementation of major changes within the ATS and Airways system.

5.2.2   Furthermore, it was recognized that many charting services, ATM and aircraft navigation systems were driven by databases, which are upgraded through the timely and accurate notification of changes to aeronautical information.

5.2.3   The meeting noted that significant changes to aeronautical information involving more than one State or FIR should be delivered to recipients no less than 56 days in advance of the effective date, and that additional transit times may be required to allow for security processing at the receiving end.

5.2.4   The view was expressed that States may wish to consider sending initial advice of data changes via E-mail, to ensure that database upgrades are prepared, ahead of formal receipt of changes to aeronautical information via normal postal channels.

5.2.5   The meeting was of the opinion that these matters relating to the timely and accurate dissemination of aeronautical information should be referred to the ATS/AIS/SAR Sub Group for further consideration.

5.3   **Development of a Framework for Inter-Regional Coordination (IRC) Meetings**

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

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

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

5.3.4   The meeting noted that the ALLPIRG/4 meeting that was held in Montreal, Canada from 6 to 8 February 2001, addressed interregional issues in planning and implementation of air navigation systems including CNS/ATM systems in ICAO Regions and advised the ICAO Council on related matters as appropriate. ALLPIRG/4 developed sixteen conclusions enveloping a wide range of issues. Conclusions appropriate to CNS/ATM activities are detailed in Appendix A to the Report on Agenda Item 5.

5.3.5   The ICAO Council reviewed the ALLPIRG/4 report on 8 June 2001, taking into account the comments of the Air Navigation Commission, and approved the report. As a follow-up, the APANPIRG, as well as other planning and implementation regional groups (PIRGs) were to take certain follow-up actions on the conclusions of ALLPIRG/4.

5.3.6   With regard to ALLPIRG/4 Conclusion 4/8 relating to Environmental benefits of CNS/ATM systems, this subject is addressed under Agenda item 10 of the Report.

CONCLUSIONS DEVELOPED BY ALLPIRG/4

Conclusion 4/1   –   A general framework and terms of reference for interregional coordination meetings

That the Council agree to adopt a general framework and terms of reference for interregional coordination meetings (IRCMs) as set out in Appendices A and B to the report on Agenda Item 2.

Conclusion 4/2   –   Interregional meetings specifically dedicated to interface areas

That ICAO convenes interregional meetings, as and when required, to address the specifically focussed interface problems and other issues of neighbouring States and/or neighbouring regions as a whole.

Conclusion 4/8   –   Environmental benefits of CNS/ATM systems

That:

a) ICAO Regional Offices and PIRGs support ICAO/CAEP efforts to expand the methodology for the quantification of CNS/ATM environmental benefits to each region by collecting data, as necessary;

b) ICAO/CAEP continue its work on the expansion of the methodology for the assessment of the environmental benefits associated with the implementation of CNS/ATM systems to the various regions; and

a) ICAO proceeds with the revision of the methodology for inclusion in the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750) at the earliest opportunity

Conclusion 4/10   –   Reporting of shortcomings and deficiencies

That where a State, by virtue of Article 38, has notified ICAO of a difference to Standards and Recommended Practices governing the actual provision of facilities and services listed in an air navigation plan, the non-implementation of a facility or service, in the context of the uniform methodology for the identification and reporting of air navigation shortcomings and deficiencies, should not be reported as either a shortcoming or a deficiency when it has no negative impact on safety, regularity and/or efficiency.

Conclusion 4/11   –   Single definition

That ICAO be invited to refine the following single definition of a shortcoming/deficiency with a view to its incorporation into the uniform methodology for the identification and reporting of air navigation shortcomings and deficiencies:

> "A *deficiency* is a situation where a facility, service or a procedure is not provided in accordance with ICAO Standards and Recommended Practices which has a negative impact on the safety, regularity and/or efficiency of international civil aviation".

Conclusion 4/13 – Database developments

That ICAO:

a) post promptly all tabular material from all regional air navigation plans relating to facilities and services to an ICAO-controlled web site in a simple PDF format;

b) invite CNS/ATM partners to post their relevant planning material on the web site referred to in a) above;

c) provide appropriate free access to relevant ICAO Headquarters' Sections, Regional Offices, PIRGs and participating CNS/ATM partners;

d) maintain the currency of this database, *inter alia*, to take account of amendments made to hard copy ANPs;

e) with the assistance of PIRGs and interested CNS/ATM partners, refine and develop the database, as a matter of urgency, to provide access and functionality commensurate with its use as a planning tool and in line with ICAO sale of publications practices.

Agenda Item 6:   **Review the establishment of an airspace safety monitoring organization and structure for the Asia/Pacific Region**

6.1   The meeting received a short briefing on the outcomes of the second meeting of the Asia Pacific Airspace Safety monitoring Task Force (APASM TF/2) held in the ICAO Regional Office, Bangkok, Thailand from 4 – 7 March 2002.

6.2   The meeting was advised that the APASM TF/2 mainly focused their work in the development of a business plan to cover all aspects of the airspace safety monitoring programme.

6.3   As the Report of the APASM TF/2 had not as yet been distributed to its members, copies of the mentioned report could not be made available to this meeting. Copies of this report will be distributed to Asia/Pacific States shortly.

Agenda Item 7:   Review business planning initiatives and applications for the implementation of CNS/ATM systems within the Asia/Pacific Region

7.1   **Business Planning and Reporting in the Civil Aviation Authority of New Zealand**

7.1.1   New Zealand advised the meeting that the CAA, while recognising that its planning systems are complex due to the nature of its relationship with Government and its status as a Crown Owned Entity, it has been successful in its business planning activities. It is intended that further development of the planning system under the control of the CAA be undertaken in the 2002/2003 period and that this development will bring an even sharper focus and better results to the CAA's safety risk management endeavours.

7.2   **NZ ATM Direction**

7.2.1   New Zealand presented a paper outlining their strategic planning process for the evolution of ATM in the New Zealand environment. The framework for this process is known as the New Zealand ATM Direction, which documents the general requirements for systems, infrastructure, procedures and rules necessary for a dynamic and progressive aviation industry.

7.2.2   The ATM Direction, which is currently in draft form, will provide a common basis for planning for all sectors of the industry. The ATM Direction is owned by the industry not by any one stakeholder, and covers a fifteen-year time frame with annual renewals. The plan when published will be available on the Airways (www.airways.co.nz) and CAA (www.caa.govt.nz) websites and will have a link from the ICAO Asia/Pacific Regional Office web-site.

7.3   **Australian Air Traffic Management Strategic Plan**

7.3.1   The meeting was presented with an overview of the Australian Air Traffic Management Strategic Plan. The view was expressed that, in the past, Air Navigation Service providers established ground infrastructure and services, with little direct consultation with airspace users.

7.3.2   In adopting ATM strategic planning, however, it was recognized that the major advancements promised by new technologies required co-coordinated introduction of equipment, techniques and procedures by Airlines, Airports, ATM Service providers and other members of the aviation community.

7.3.3   The meeting noted that the strategic management framework adopted by Australia incorporated a systematic and collaborative approach by all ATM stakeholders to ATM planning and implementation. The meeting was further advised that the Australian Air Traffic Strategic Plan had been published on the Internet at www.austatmsp.gov.au and that a link to this site would be placed on the ICAO Asia/Pacific Regional Office web-site.

Agenda Item 8:   Review and identify deficiencies in the air navigation field

8.1   Under this agenda item, the meeting noted the adoption by the Council of a single definition of both shortcoming and deficiency as "Deficiency"

8.2   The meeting reviewed the list of deficiencies in the CNS and ATM fields and updated it based on progress made by States in resolving deficiencies. The updated list of information is highlighted and provided in Appendix A and B to the Report on Agenda Item 8. It was noted that a formal notification of implementation should be provided by concerned Administrations to ICAO to delete the deficiency from the list.

8.3   While reviewing the table, it was noted that in some cases the reason for protracted delays in implementation was not provided. It was, therefore, agreed that the reasons for delay in implementation should be provided under the heading "Corrective Action" in column "Description".

AIR NAVIGATION DEFICIENCIES IN THE CNS FIELD IN THE ASIA/PACIFIC REGION

Identification		deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status	Remarks	Description	Executing body	Target date for completion	Priority for action**
VHF coverage to be provided in the Southern Part of Dhaka FIR and withdrawal of HF	Bangladesh	No requirement for HF except for smaller portion of FIR.HF used for ground-to-ground COM due to lack of ER VHF and reliable ATS DSCs.	1992	No change	HF air ground channels are used to exchange co-ordination messages causing frequency congestion	Survey of the installation sites for RCAG stations has been completed and other formalities are in progress.	Civil Aviation Authority of Bangladesh	Target date being changed each time the status was reviewed and currently established for June 2002.	A

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

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

Identification		deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status	Remarks	Description	Executing body	Target date for completion	Priority for action**
Adequate and reliable VHF COM	Myanmar	Quality and reliability of RCAG VHF inadequate and unavailability of required coverage	1998	No change	Improvements in the quality of link to RCAG stations and power supply system are required.	Action should be taken to provide reliable links between the RCAG stations and Yangon ACC. Power supply to the RCAG sites needs improvement.	DCA Myanmar	Established target date of end 1999 was not achieved. Revised target date is end of 2002	A

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

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

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

Identification		Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
A341	Indonesia/Malaysia	Partially implemented	24/11/93	D	ICAO has requested Indonesia to co-ordinate implementation with Malaysia	Indonesia/Malaysia - consider full implementation	Indonesia/Malaysia	12/2001	B
A450	Indonesia/United States	Partially implemented	24/6/94	D	ICAO has requested Indonesia to co-ordinate implementation with United States. United States has agreed to the implementation, and a response from Indonesia is being awaited.	Indonesia/United States - consider full implementation	Indonesia/United States		B
A469	Viet Nam	Implemented as W9	19/8/94	D	ICAO has requested Viet Nam to implement as A469. Viet Nam advised that W9 will be replaced with L643 on 1 November 2001.	Viet Nam - propose deletion of the requirement as A469	Viet Nam	1/11/2001	B
A470	China/Viet Nam	Partially implemented	19/8/94	D	Co-ordination is in progress among States and ICAO through SCS/TF. Mersing-Hong Kong segment will be deleted from the ANP requirement, and the rest will be implemented on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States	China/Viet Nam	1/11/2001	B
A473	India/Nepal	Not implemented	16/3/99	D	India has advised that realignment is being co-ordinated with Nepal.	India/Nepal- consider implementation	India/Nepal	10/2002	B
A581	Lao PDR/Thailand	Partially implemented	17/2/97	D	China, Lao PDR and Thailand proposed an amendment to ANP.	ICAO processed APAC99/11 in co-ordination with China/Myanmar/Thailand. APAC99/1 was approved on 15 December 2000. Lao PDR/Thailand - implement accordingly.	Lao PDR/Thailand		B

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

Identification						Corrective action			
		Deficiencies							
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
A584	United States	Partially implemented	24/6/94	D	ICAO has requested United States to implement the missing segment. United States has proposed deletion of the missing segment, and the proposal is under preparation.	ICAO - process an amendment in co-ordiantion with United States	United States ICAO		B
B201	Fiji/New Zealand	Not implemented	24/11/93	D	Fiji/New Zealand have advised that they agreed to delete the requirement, ICAO will process ANP amendment.	Fiji/New Zealand - propose an amendment to delete the requirement in ANP	Fiji/New Zealand ICAO		B
B204	Maldives	The requirements for this route are not detailed in ANP	24/1/96	D		Maldives - propose an amendment to ANP to add the route	Maldives		B
B212	Japan/Rep of Korea	Not implemented	24/11/93	D	Japan is considering implementation as a conditional route	Japan/Rep of Korea - consider implementation	Japan/Rep of Korea		B
B213	China	Not implemented	24/11/93	D		China - consider implementation	China		B
B456	Papua New Guinea	Partially implemented	24/11/93	D	Papua New Guinea has advised that they will formally propose ANP amendment for deletion of the missing segment.	Papua New Guinea - propose an amendment to ANP. ICAO-process ANP amendment.	Papua New Guinea ICAO		B
B591	China	Partially implemented	22/7/97	D	Co-ordination is in progress among States and ICAO	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States	China		B
G211	Malaysia	Not implemented	24/11/93	D	ICAO has requested Malaysia to implement G221. Malaysia has advised that implementation co-ordination is on-going.	Malaysia - consider implementation	Malaysia	12/2001	B

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

Identification		Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
G348	India	Implemented	2/3/99	Implemented	Bhutan has advised that route segment in Bhutan airspace has been implemented.	India - implement the route	India	Implemented	
G461	Indonesia	Implemented with different route specification	24/11/93	D	ICAO has taken action to co-ordinate with Indonesia to amend ANP requirement. APAC00/1-ATS to amend the requirement has been circulated.	ICAO - process APAC 00/1. APAC00/1 was approved on 15 January 2001. Indonesia-implement the requirement accordingly.	Indonesia ICAO		B
G466	Malaysia	Partially implemented	22/7/97	D	Co-ordination is in progress among States and ICAO. Route requirement will be amended in relation to SCS route structure and be implemented on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States Malaysia - consider implementation	Malaysia	1/11/2001	B
G473	Lao PDR/Philippines Thailand/Viet Nam	Partially implemented	24/11/93	D	Co-ordination is in progress among States and ICAO	ICAO - continue ongoing implementation co-ordination related to the Revised South China Sea route structure with States	Lao PDR/Philippines Thailand/Viet Nam		B
G589	DPR Korea/ Rep of Korea	Not implemented	24/11/93	D		DPR Korea/ Rep of Korea - consider implementation	DPR Korea/ Rep of Korea		B
R207	Lao PDR	Partially implemented as W29	24/11/93	D		Lao PDR - consider promulgation of the route with route designator R207	Lao PDR		B
R216	China/Kazakhstan	Not implemented	24/11/93	D		ICAO - co-ordinate with States for implementation and report the outcome to EAAR	China/Kazakhstan		B

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

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

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

Identification		Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
R579	Indonesia/Malaysia	Not implemented	24/11/93	D	ICAO has requested Malaysia to co-ordinate with Indonesia for implementation.	Indonesia/Malaysia - consider implementation	Indonesia/Malaysia	12/2001	B
R593	India/Oman	Not implemented	24/11/93	D		India - consider implementation ICAO - co-ordinate with Oman for implementation and report the outcome to SWACG	India/Oman (SWACG) ICAO		B
Revised South China Sea Route Structure	Cambodia/China/ Hong Kong, China/Malaysia Philippines/Singapore/ Thailand/Viet Nam	Implemented	22/7/97	Implemented	Co-ordination is in progress among States and ICAO. States concerned agreed to implement SCS route structure on 1 November 2001.	ICAO - continue on-going implementation co-ordination related to the Revised South China Sea route structure with States through SCS/TF.	Cambodia/China/ Hong Kong,China/Malaysia/ Philippines/Singapore/ Thailand/Viet Nam	1/11/2001	
WGS-84									
WGS-84	Bhutan	Not implemented	2/7/1999	D	Data conversion completed, but not published		Bhutan		A
WGS-84	Cambodia		28/6/2001	D	Cambodia has previously informed ICAO that their WGS-84 conversion had been completed. Cambodia has now informed ICAO of flaws in their conversion and their intention to start all over again.		Cambodia		A
WGS-84	China	Not implemented * implemented in the Sanya AOR as of 1 Nov 2001	2/7/1999	D	Differences to Annex 15 - *Aeronautical Information Services* are notified		China		A
WGS-84	DPR Korea	Not implemented		D			DPR Korea		A

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

Identification			Deficiencies			Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
WGS-84	French Polynesia	Implemented at main airports		D	in progress		French Polynesia	2003	A
WGS-84	Kiribati	Not implemented		D			Kiribati		A
WGS-84	Lao PDR	Partially implemented		D			Lao PDR	1999	A
WGS-84	Malaysia	Implemented		Implemented	in progress		Malaysia	June 2001	
WGS-84	Nauru	Not implemented		D	Conferring with consultant		Nauru		A
WGS-84	Philippines	Implemented at main airports		Implemented	on-going		Philippines	2003	A
WGS-84	Solomon Islands	Not implemented		D			Solomon Islands	1999	A
WGS-84	Vanuatu	Implemented at main airports	2/7/1999	D			Vanuatu	1999	A
Type of ATS									
Area Control Services	India	Some ATS route segments in part of Mumbai FIR are subject to Advisory Services	24/11/93	D	Co-ordination in progress through BBACG	India - implement Area Control Services	India		A
Area Control Services	Sri Lanka	Several ATS route segments are subject to Advisory Services	24/11/93	D	Co-ordination in progress through BBACG	Sri Lanka - implement Area Control Services	Sri Lanka		A
Airspace Classification									
Airspace Classification	China	Not implemented	7/7/99	D			China		A

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

	Identification			Deficiencies			Corrective action			
Requirements	**States/facilities**	**Description**	**Date first reported**	**Implementation status (D)***	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action****
Airspace Classification	Cook Islands	Not implemented	7/7/99	D			Cook Islands		A
Airspace Classification	DPR Korea	Not implemented	7/7/99	D			DPR Korea		A
Airspace Classification	Japan	Not implemented	7/7/99	D		Implementation in progress	Japan		A
Airspace Classification	Kiribati	Not implemented	7/7/99	D			Kiribati		A
Airspace Classification	Lao PDR	Not implemented	7/7/99	D			Lao PDR		A
Airspace Classification	Nauru	Not implemented	7/7/99	D			Nauru		A
Airspace Classification	Papua New Guinea	Not implemented	7/7/99	D			Papua New Guinea	mid 2001	A
Airspace Classification	Republic of Korea	Not implemented	7/7/99	D			Republic of Korea		A
Airspace Classification	Samoa	Not implemented	7/7/99	D			Samoa		A
Airspace Classification	Solomon Islands	Not implemented	7/7/99	D			Solomon Islands		A
Airspace Classification	Sri Lanka	Not implemented	7/7/99	D			Sri Lanka		A
Airspace Classification	Tonga	Not implemented	7/7/99	D			Tonga		A
Airspace Classification	Viet Nam	Not implemented	7/7/99	D			Viet Nam		A
AIP Format									
AIP Format	China	Not implemented	7/7/99	D			China		A
AIP Format	Cook Islands	Not implemented	7/7/99	D			Cook Islands		A

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

Identification						Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
AIP Format	Fiji	Not implemented	7/7/99	D			Fiji	06/2002	A
AIP Format	India	Implemented	7/7/99	Implemented			India	Implemented	
AIP Format	Indonesia	Not implemented	7/7/99	D		Implementation in progress	Indonesia		A
AIP Format	Kiribati	Not implemented	7/7/99	D			Kiribati		A
AIP Format	Lao PDR	Not implemented	7/7/99	D			Lao PDR		A
AIP Format	Myanmar	Not implemented	7/7/99	D			Myanmar		A
AIP Format	Nauru	Not implemented	7/7/99	D			Nauru		A
AIP Format	New Zealand	Not implemented	7/7/99	D	Differences to Annex 15 - *Aeronautical Information Services* are notified		New Zealand		A
AIP Format	Papua New Guinea	Not implemented	7/7/99	D	under development		Papua New Guinea	TBA	A
AIP Format	Philippines	Implemented	7/7/99	Implemented			Philippines	Aug 2001	
AIP Format	Samoa	Not implemented	7/7/99	D			Samoa		A
AIP Format	Sri Lanka	Not implemented	7/7/99	D			Sri Lanka		A
AIP Format	Tonga	Not implemented	7/7/99	D			Tonga		A
SAR capability									

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

Identification		Deficiencies				Corrective action			
Requirements	States/facilities	Description	Date first reported	Implementation status (D)*	Remarks	Description	Executing body	Target date for completion	Priority for action**
SARPs in Annex 12	Cambodia	Annex 12 requirements not implemented. No agreements with adjacent States.	20/2/97	D		Cambodia - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cambodia		U
SARPs in Annex 12	Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95	D		Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands		U
SARPs in Annex 12	Maldives	Annex 12 requirements not implemented. No agreements with adjacent States.	24/4/1997	D		Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Maldives		U

Agenda Item 9:   Review the outcome of the 38th Conference of the Directors General of Civil Aviation Asia/Pacific Regions related to CNS/ATM systems

9.1   The meeting reviewed the list of Action Items developed by the 38th Conference of the Directors General of Civil Aviation Asia/Pacific Region held in Seoul, Republic of Korea from 5 to 9 November 2001 and discussed in detail the following items which were of direct interest to the Sub-Group.

9.1.1   The meeting noted Action Item 38/4 in which States were strongly urged to have the designated contact person involved in the preparation at a national level for WRC-2003 and to arrange attendance at the APT Conference Preparatory Group Meeting for WRC-2003 to protect aviation interest. It was noted that the Regional Preparatory Group Meeting for WRC-2003 referred in the Action Plan was held in Bangkok from 15 to 16 November 2001 and was well attended. It was also noted that the Regional Office had already taken follow up action on this Action Item by drawing attention of Administrations to this Action Item.

9.1.2   The meeting noted that Action Item 38/5 strongly urged all States to take appropriate measures and fully cooperate in the resolution of deficiencies on a high priority basis and report the corrective action taken to the ICAO Regional Office well in time for review by APANPIRG. The meeting was advised that the ICAO Secretariat had issued a State Letter drawing attention of States concerned to notify the Secretariat of actions taken in accordance with the Action Items agreed including Action Item 38/5. However, notification of specific action taken by concerned States were yet to be received.

9.1.3   The meeting noted Action Item 38/8 in which it was stated that in view of the near CFIT accident of flight NZ60 on 29 July 2000 and lesson learnt with regard to ILS system failure, the Conference urged that the Directors General disseminate information pertaining to the incident in drawing the attention of all operators, air navigation service providers and other agencies and report back to ICAO on the action taken within six months. The meeting considered that this matter would be of interest to the CNS/MET Sub-Group for study and appropriate action at the Sixth Meeting of the Sub-Group to be held in July 2002.

Agenda Item 10:   Consider environmental issues related to implementation of CNS/ATM systems

10.1   **Aviation environment policy**

10.1.1   The meeting was advised how the Environment Management System (EMS) used by Airservices Australia is able to deliver policy direction, impact identification, risk assessment and management programming in compliance with the requirements of current Australian legislation.

10.1.2   The meeting noted Airservices Australia's work in the development of EMS, Noise mitigation, Emissions reduction and the development of Key Performance Indicators within the Air Traffic Management Strategic Plan for Australia.

10.1.3   The meeting further considered the broader environmental issues in relation to implementation of CNS/ATM systems and recalled that recent initiatives such as the implementation of RVSM, FMS approaches to Auckland International Airport and EMARSSH Phase one, had all produced environmental benefits.

10.1.4   Following further discussion and noting Conclusion 4/8 of ALLPIRG/4 (Environmental benefits of CNS/ATM systems), the meeting considered the advantages of establishing a Working Group to develop a position paper regarding environment benefits of CNS/ATM systems for consideration at the next CNS/ATM/IC/SG meeting. The Secretariat recommended that the Working Group's first priority should be the development of Terms of Reference for an environmental Task Force. Australia, Japan, New Zealand and the United States of America agreed to participate in the Working Group. Input would be sought from other States and Organizations. To save on cost, it was suggested that the co-ordination could be achieved by e-mail and, if necessary, conference telephone facilities.

10.1.5   It was further proposed that a dedicated area on the ICAO Asia/Pacific web-site be established, where States and Organizations could post environmental papers and related materials.

10.1.6   The meeting agreed to the following decision and draft conclusion:

Decision 9/6   -   Environmental Benefits of CNS/ATM Systems

That, in support of ALLPIRG/4 Conclusion 4/8, a CNS/ATM Working Group be established, consisting of members from Australia, Japan, New Zealand and the United States, to:

a) Develop the Terms of Reference for an environmental Task Force which is to provide a position paper addressing environmental benefits of CNS/ATM in the Asia/Pacific region;

b) Include the following key elements within the Draft Terms of Reference for the environmental Task Force:

    i.   Task (s)
    ii.   Membership – including Rapporteur
    iii. Reporting point (e.g. CNS/ATM/IC/SG, or APANPIRG)
    iv.   Reporting date (e.g. APANPIRG/15)

c) Report to APANPIRG/13 through the Chairman of the CNS/ATM/IC/SG

**Draft Conclusion 9/7   -   Creation of a web-site for CNS/ATM Environmental
                               Issues**

That, ICAO be requested to create a page on the ICAO Asia/Pacific web-site
dedicated to post CNS/ATM environment issues.

Agenda Item 11:   Review the development of the ICAO ATM Operational Concept and develop guidance material as appropriate

11.1   There were no papers under this agenda item.

Agenda Item 12:   Develop a framework for regional training plans for CNS/ATM systems

12.1   There were no papers under this agenda item.

Agenda Item 13:   Review the APANPIRG/12 Report and subsequent ANC/Council Actions with respect to CNS/ATM issues

13.1   The APANPIRG/12 Meeting, which was held in Bangkok, Thailand, 20-24 August 2001, took action on the Conclusions and Decisions formulated by the CNS/ATM/IC/SG/8 Meeting held in Bangkok 30 July – 3 August 2001.

13.2   In reviewing the actions taken by ANC and Council, the meeting was advised of several comments by the Air Navigation Commission (ANC) with regard to the work of APANPIRG/12.

13.3   In reviewing the report of the meeting, the ANC (Commission) noted that APANPIRG, with the assistance of its contributory bodies, had examined the air navigation matters of the Asia/Pacific Regions with the aim of improving the planning of air navigation facilities, services and procedures in the region, as well as fostering their implementation.

13.4   The Commission noted that reduced vertical separation minimum (RVSM) had been implemented in Western Pacific/South China Sea airspace effective from 21 February 2002. Regarding the implementation of RVSM in the Bay of Bengal area and beyond, the Commission urged the States of this area to implement RVSM in conjunction with the planned implementation in the Middle East Region on 27 November 2003. This would not only improve the availability of efficient cruising levels and reduce ground delays for flights from Asia to Europe South of the Himalayas, but would also provide an end-to-end Asia/Europe RVSM environment through the Middle East, without transition areas.

13.5   To gain benefits in terms of safety, efficiency and capacity enhancements, the Commission noted that the Europe, Middle East, Asia route structure South of Himalayas (EMARSSH) project was established, with a target date of implementation set for 28 November 2002. The Commission called upon participating States and international organizations to make a full commitment to this project.

13.6   The meeting was advised that the Commission agreed with the need for regional safety arrangements necessary to meet the ongoing revision of the ATS route structure and the introduction of reduced horizontal and vertical separation minima, as well as the implementation of new systems such as automatic dependent surveillance (ADS) and controller-pilot data link communications (CPDLC) operations. The Commission noted that APANPIRG had established a task force to examine in detail the necessary arrangements to develop an appropriate regional airspace safety performance-monitoring structure and funding mechanism. The Commission appreciated this initiative and called upon the Secretary General to develop provisions for a global approach to establishing airspace safety performance-monitoring arrangements.

13.7   On the subject of Deficiencies in the Air Navigation field, the Commission noted in particular the resolution of several deficiencies and appreciated the ongoing efforts of APANPIRG in this regard. The Commission agreed with APANPIRG's observation that, addressing deficiencies requires a concerted effort by States as well as a financial commitment for their resolution. In this regard, the establishment of the International Financial Facility for Aviation Safety (IFFAS), which was approved by the 33rd Session of the ICAO Assembly, could provide a potential mechanism for the mobilization of funds for civil aviation.

13.8   Actions taken by ANC and the Council including States and the Secretariat on the Conclusions and Decisions of APANPIRG/12 Meeting are shown at Appendix A to the Report on Agenda Item 13.

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

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 12/38	**Conclusion 12/38 - Revision and Publication of Guidance Material on CNS/ATM Operations in the Asia/Pacific Region** That, a) the *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region,* Chapter 4, paragraph 6 on the application of separation using ADS be revised in line with the views of the Air Navigation Commission (157-2) on reviewing the report of APANPIRG/11 as follows: **6. Application of procedural horizontal separation using ADS** Aircraft position information obtained by ADS may be used for the application of procedural horizontal separation minima contained in the PANS-RAC (Doc 4444), Part III. Area Control Service where aircraft position reports are necessary to apply the appropriate separation minimum. *Note: - ICAO is processing amendments to the PANS-RAC to include procedures for the provision of ADS services for air traffic control with an applicability date in November 2002.* b) the revised *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region* be published by ICAO as soon as practicable.		Follow-up action will be taken by the Secretary General in accordance with established practice.

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 12/39	**Decision 12/39 - Development of guidance material on the use of ADS for the application of separation** That, the CNS/ATM/IC/SG review the provisions in the PANS-ATM. Part XII (Doc 4444) on ADS services, and develop guidance material on the use of ADS for the application of separation to be included in the *Guidance Material on CNS/ATM Operations in the Asia/Pacific Region* as appropriate..		Follow-up action will be taken by the Secretary General in accordance with established practice.
	D12/40	**Decision 12/40 Inclusion of traffic forecast tables in the Asia/Pacific Regional Plan for the New CNS/ATM Systems** That, the tables of the traffic forecast values for the nine major traffic flows across the Asia/Pacific region be included in the *Asia/Pacific Regional Plan for the New CNS/ATM Systems* as shown in Appendix A to the Report on Agenda Item 3.	<u>Council</u> Noted the decision and that the traffic forecasts would assist States in planning future facilities and requested the Secretary General to monitor related developments in other regions to ensure a uniform approach.	In the light of September 11 2001, further work on revised traffic forecast tables is considered necessary.

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 12/41	**Conclusion 12/41 – Establishment of a Target Level of Safety for the Asia/Pacific Region** That, a target level of safety of 5 x 10^{-9} fatal accidents per flight hour per dimension be established for en-route systems in the Asia/Pacific Region where a TLS is required for implementation of separation minima.	The Commission noted that APANPIRG had established, by a regional agreement and in accordance with ICAO provisions, a target level of safety (TLS) of 5 x 10^{-9} fatal accidents per flight hour per dimension for en-route systems in the Asia/Pacific Regions, where a TLS is required for implementation of separation minima	
D 6/9	C 12/42	**Conclusion 12/42 – State regulatory framework for safety oversight** That, States establish the necessary regulatory framework to provide safety oversight of their air navigation services in accordance with Annex 11 and PANS-ATM provisions on airspace safety management applicable on 1 November 2001.	<u>Council</u> Noted the conclusion and requested the Secretary General to urge States to establish the necessary regulatory framework to provide safety oversight arrangements of their air navigation services not only in accordance with Annex 11 and PANS-ATM but also Annex 14 provisions on safety management.	This is being addressed by the APASM Task Force.

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	C 12/43	**Conclusion 12/43 – Provision of ICAO guidance material on the establishment of airspace safety arrangements** That, as matter of urgency, ICAO develop guidance material for States to establish safety management arrangements in accordance with Annex 11 and PANS-ATM provisions on airspace safety management applicable on 1 November 2001.	<u>ANC</u> Noted the conclusion and that the Secretariat had already made considerable progress in the development of draft material, which is scheduled for completion by mid-2002.	Follow-up action will be taken.
	D 12/44	**Decision 12/44 – Establishment of a Task Force to Develop an Airspace Safety System Performance Monitoring Structure for the Asia/Pacific Region** That**,** a Task Force be established reporting to APANPIRG to develop an airspace safety system performance monitoring structure and funding mechanism for the Asia/Pacific Region in accordance with ICAO provisions. The composition, guiding principles and Terms of Reference of the Task Force are as shown in the Appendix B to the Report on Agenda Item 3.	<u>ANC</u> Noted the decision and requested the Secretary General to develop provisions for a global approach to establishing airspace safety performance-monitoring arrangements.	Two Task Force Meetings have taken place. The Third meeting is scheduled for 22-24 July 2002.
	C 12/45	**Conclusion 12/45 – Key Priorities for CNS/ATM Implementation** That, the updated key priorities for CNS/ATM implementation at Appendix E to the Report on Agenda Item 3 be adopted.		The Key Priorities for CNS/ATM Implementation were reviewed at CNS/ATM/IC/SG/9

Report Reference		Decision/Conclusion	Action by ANC / Council	Action taken by States/ICAO
Decision /Conclusion of SG	Decision /Conclusion of APANPIRG			
	D 12/46	**Decision 12/46 – Amendment to the Terms of Reference of the CNS/ATM/IC/SG** That, the CNS/ATM/IC/SG should continue as an active Sub-Group of APANPIRG and the revised Terms of Reference be adopted as shown in Appendix F to the report on Agenda Item 3.		The Terms of Reference of the CNS/ATM/IC/SG were reviewed at APANPIRG/12
	D 12/47	**Decision 12/47 – Follow-up actions on the Conclusions of ALLPIRG/4 Meeting** That, the following conclusions of ALLPIRG/4 meeting be addressed by the relevant subgroups as part of their work programme and report its outcome. Conclusions 4/1, 4/2, 4/8 and 4/13- CNS/ATM IC SG Conclusions 4/3 and 4/7- ATS/AIS/SAR SG Conclusions 4/3 - CNS/MET SG Conclusions 4/10 and 4/11- All Subgroups		Follow-up action will be taken.

Agenda Item 14:   Develop and propose to APANPIRG an appropriate future work programme

14.1   **Review Terms of Reference**

14.1.1   The meeting discussed and reviewed the Terms of Reference (TOR) for the CNS/ATM/IC/SG as agreed by APANPIGR/12 and shown at Appendix A to the Report on Agenda Item 14. It was considered that the meeting had been very productive and that delegates found considerable value from the discussions on the wide range of material presented for consideration. The meeting observed that while the TORs had been expanded to include training, environmental issues and the use of business case studies, there was also a need for future discussions to be more directed towards implementation to realize the full benefits of the planning. The establishment of target dates for actions items would also assist States in determining future work priorities.

14.1.2   To achieve these improvements in future meetings the meeting recommended that the Secretariat provide additional guidelines in the form of explanatory notes for each agenda item when providing notification of the meeting.   These guidelines could be directed to specific topics and provide an indication as to the depth and future use to be made of the material being presented. It was considered that this would be beneficial to States in their preparation of papers to post them on the ICAO Asia/Pacific web-site.

14.2   **Work Programme Review issues**

14.2.1   The meeting reviewed the working paper prepared by the Chairpersons of APANPIRG's three active Sub-Groups. It was noted that the Chairpersons of the ATS/AIS/SAR, CNS/ATM and CNS/MET Sub-Groups met in December 2001 and considered co-ordination between the Sub Groups and other bodies which contribute to APANPIRG.   Following an attempt to identify all work in progress from established and disestablished constituted bodies and a review of the major meeting reports from which issues that warranted consideration within APANPIRG and its Sub-Groups, a tabulated list in draft form identifying the work in progress and issues for inclusion in work programs was developed.

14.2.2   The meeting acknowledged the value of the work carried out and recommended that the tabulated details in Appendix B to the Report on Agenda Item 14 be referred to the next meetings of the ATS/AIS/SAR and CNS/MET Sub Groups for consideration and amendment. The table would then be forwarded to APANPIRG for their consideration.

14.2.3   The meeting observed that implementation of CNS/ATM needs to be accelerated to derive early benefits and Sub-Group's activities are important to achieve this objective. The meeting was therefore of a strong view that this Sub-Group should continue to carry out its functions per TORs revised by APANPIRG/12.

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

TERMS OF REFERENCE

1. Review and update, on a regular basis, the "Asia/Pacific Regional Plan for the New CNS/ATM Systems" and ensure the harmonization with the Global Air Navigation Plan for CNS/ATM Systems;

2. Develop, based on the research and development, trials and demonstrations being carried out in the Asia/Pacific as well as other regions, regional guidance material for the implementation of CNS/ATM systems;

3. Co-ordinate the plans of States, international organizations, airlines and industry for the implementation of the ASIA/PAC Regional Implementation Plan for the CNS/ATM systems under development and implementation;

4. Identify key priorities for implementation of CNS/ATM for the ASIA/PAC region, co-ordinate and monitor implementation;

5. Review and identify intra and inter-regional CNS/ATM co-ordination matters and where appropriate recommend actions to address these issues;

6. Co-ordinate and harmonize the establishment and operation of ASIA/PAC system performance monitoring agencies for implementation of CNS/ATM systems and reduced separation minima, and co-ordinate with other regional monitoring agencies; and

7. Develop guidance material for the applicability of the ICAO ATM Concept in the Asia/Pacific Region, taking into account national planning;

8. Develop business cases for various options of CNS/ATM implementation taking into account environmental benefits; and

9. Develop a framework for regional training plans for the introduction of CNS/ATM systems and to include this material in the "Asia/Pacific Regional Plan for the New CNS/ATM Systems".

…………………………

Title	SG Responsible	Decision	ToR	Report Date
ANP/FASID Review Working Group	CNSMET 5	D5/24		CNSMET 6
ASIA/PAC WAFS Transition Task Force	CNSMET5	D5/16		
ATN Transition Task Force	APANPIRG		CNSMET 5 Appendix K	
METATM Task Force on CNS/ATM Plan	CNSMET5	D5/30	CNSMET 5 p40 and Appendix 1G	CNSMET6
MET Working Group on the CNS/ATM	CNSMET5	D5/29		Dissolved
Asia/Pacific Safety Management TF (Asia Pacific Regional System Performance Monitoring Organisation TF)	APANPIRG 12	D12/44	APANPIRG 12 Appendix 3B	APANPIRG 13
Business Case TF	APANPIRG 12		Report 3.82	
CNS/ATM Training and Human Resource Development Task Force	APANPIRG 9	D9/39	Report	
RVSM Implementation Task Force	ATS/AIS/SAR SG			
LTMP WG Long Term Monitoring Performance Working Group	ATS/AIS/SAR SG RVSM TF	3.1.32		
Bay of Bengal Task Force	ATS/AIS/SAR SG			
AIS Automation TF	ATS/AIS/SAR SG			
SCS Task Force	ATS/AIS/SAR SG			
AFS Management Task Force	CNS/MET	?	Dissolved	Finished
NAV/SUR TF	CNS/MET		Dissolved	Finished
ICD Task Force	ATS/AIS/SAR	?		Finished
OPMET Working Group	CNS/MET	?		
WAFS Transition Task Force	CNS/MET			
Working Group on Volcanic Ash	CNS/MET			
ASIA/PACIFIC Area Traffic Forecasting Group ATA TFG	?			
CNS/ATM Implementation Team			APANPIRG 12	
Chairmen's Meeting				
Environmental Issues Task Force	APANPIRG		ALLPIRG/4 IC SG to action	
Operations Manual			Craig Roberts	Dissolved APANPIRG 8??
EMARSSH TF	ATS/AIS/SAR			

Title	SG Responsible	Decision	ToR	Report Date
SSR Code Assignment Working Group	ATS/AIS/SAR			
SSR Code Management TF	ATS/AIS/SAR	D11/3		Suspended
CNS/ATM Guidance Material TF	ATS/AIS/SAR	APANPIRG 9/42		
APANPIRG 7 Training Task Force	APANPIRG 7			
AOP Study/Sub Group??	ICAO	DGCA R3.17.6		
Shortcomings and Deficiencies TF or subgroup	ICAO	DGCA R3.18.2		
Cooperative Development of Operational Safety and Continuing Airworthiness Programme – South East Asia (COSCAP)				
Cooperative Development of Operational Safety and Continuing Airworthiness Programme – South Pacific (COSCAP)				
Cooperative Development of Operational Safety and Continuing Airworthiness Programme – North East Asia (COSCAP)				
Forum of Aviation Officials				
Pacific Aviation Safety Office (PASC)				
Safety Regulation and Oversight Office				
GNSS Task Force	CNSMET			Completed
RACGAT				
Informal Trans-Asia/Trans-Siberia/Cross-Polar Routes High level Steering Group (ITASPS)				
IPACG				
ISPACG				

ISSUES

Airports
- Surface movement and runway incursions
- RESA Runway end safety areas

CNS/MET
CNS/ATM IC
- APEC GNSS Implementation Team
- Asia Pacific SBAS testbed

Environment
- Chapter 3 noise
- Emissions

Accident Rates
- COSCAPs functions
- CFIT and ALAR (approach landing accident reduction)

SAR
- biennial SAR meeting in place of continuation in the ATS/AIS/SAR SG

Technical Panels and Study Group
- update and feedback to be presented at each subgroup

ASIA/PACIFIC Groups
- established consolidated list of task forces and working groups
- list to include establishment , Terms of Reference, membership, meeting schedules and reporting arrangements

ATS/AIS/SAR
- review of guidance material phraseology particularly chapter 6

Agenda Item 15:   Any other business

15.1   **Major ANS developments in the South China Sea area**

15.1.1   The meeting noted the recent major developments in air navigation services in the South China Sea area, including the implementation of the Revised South China Sea ATS Route Structure, and the introduction of RVSM in the Western Pacific/South China Sea Area.

15.1.2   The Revised South China Sea ATS Route Structure was implemented in conjunction with the trial application in implementation of the Sanya area of responsibility (AOR) on 1 November 2001. In terms of CNS/ATM developments, this ATS route restructuring introduced RNAV/RNP10 operations over the South China Sea area by implementing new RNAV routes, which replaced conventional ATS routes, in particular six major parallel routes which are spaced at 60NM with RNP10 requirements.

15.1.3   The meeting noted that Dr. David Anderson of Airservices Australia had conducted a safety analysis, which had been proved to be less than the target level of safety (TLS) of 5 x 10-9 fatal accidents per flight hour, based on the previous route structure. The meeting was also advised that a second safety assessment has been planned with a target date of 1 November 2002, based on the new route structure.

15.1.4   It was further noted that as an essential aspect of this implementation project, monitoring of aircraft navigation errors pertaining to RNP10 operations was arranged with the cooperation of States concerned. Hong Kong China, Philippines and Singapore were assigned for data collection of navigation errors in specified areas. The Civil Aviation Authority of Singapore (CAAS) was appointed as the monitoring agency responsible for the collation of the data and reporting to ATS/AIS/SAR/SG through ICAO.

15.1.5   In relation to RVSM, the meeting was advised that this was implemented in the Western Pacific/South China Sea area on 21 February 2002. Phnom Penh (Cambodia), Kota Kinabalu/Kuala Lumpur (Malaysia), Manila (Philippines), Singapore, Bangkok (Thailand), Ho Chi Minh (Viet Nam) FIRs and Sanya (China) AOR were involved in this implementation. The meeting was further advised that the next phase of RVSM implementation in the Western Pacific/South China Sea area was scheduled for 31 October 2002.

15.2   **Proposed Transonic Flights**

15.2.1   IATA advised the meeting that, with the proposed introduction of a transonic cruise commercial air transport aircraft sometime after 2005-2006, consideration needs to be given to include transonic cruise planning criteria in the BORPC section of ANPs. This lead-time is necessary to permit the timely planning of airspace requirements to accommodate this new category of aircraft.

15.2.2   IATA further advised that they would submit further information at the next APANPIRG meeting.

Agenda Item 16:   Propose date and venue for next meeting

16.1   Following APANPIRG/12's consideration of Agenda Item 6 (Future Work Programme: Schedule of Meetings) it was decided to reschedule the CNS/ATM/IC/SG/9 meeting to March 2002 on a trial basis.

16.2   While some States expressed concern about the timing of this meeting occurring in early March 2002 it was generally agreed to recommend to APANPIRG/13 that CNS/ATM/IC/SG/10 be scheduled for late March 2003.

LIST OF PARTICIPANTS

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
AUSTRALIA		
Mr. Jeffrey Bollard	Chief Engineer – Technical Standards Safety and Environmental Assurance Airservices Australia 25 Constitution Avenue Canberra ACT 2601 Australia	Tel: 61 2 6268 4949 Fax: 61 2 6268 5695 E-mail: Jeffrey.Bollard@airservices.gov.au
Mr. Ian Mallett	Head Aerodrome and CNS/ATM Standards Civil Aviation Safety Authority P.O. Box 2005 Canberra ACT 2601 Australia	Tel: 61 2 6217 1736 Fax: 61 2 6217 1700 E-mail: ian.mallett@casa.gov.au
Mr. Alexis Grenon	CNS/ATM Expert THALES ATM Pty Ltd 780 Elizabeth Street Melbourne, Victoria 3000 Australia	Tel: 61 3 9341 3678 Fax: 61 3 9347 2018 E-mail: alexis.grenon@thalesatm.com
BRUNEI DARUSSALAM		
Mr. Lucas Wong Boon Kung	CNS/ATM/SAR Officer Department of Civil Aviation Ministry of Communications Brunei International Airport Bandar Seri Begawan BB2513 Brunei Darussalam	Tel: 673-2-344764 Fax: 673-2-344201 E-mail: lucaswong@dca.gov.br
Pg. Hamlee Nor Pg. Salleh	Navigation Superintendent Royal Brunei Airlines P.O. Box 737 Bandar Seri Begawan BS8671 Brunei Darussalam	Tel: 673-2-339225 ext 167 Fax: 673-2-337214 E-mail: omhamlee@rba.com.bn

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
CHINA		
Mr. Qin Zhi	Senior Engineer of Telecommunication Division Air Traffic Management Bureau of CAAC P.O. Box 2272, Shilihe, Chaoyang Dis. Beijing 100021 People's Republic of China	Tel: 86-10-6731 8866 ext 4046 Fax: 86-10-6731 8478 E-mail: peter_qinzhi@hotmail.com
Mr. Zhu Yanbo	Chief Engineer Aviation Data Communication Corp. of CAAC P.O. Box 2272, Shilihe, Chaoyang Dis. Beijing 100021 People's Republic of China	Tel: 86-10-6733 0459 Fax: 86-10-6731 8520 E-mail: zyb@adcc.com.cn
HONG KONG, CHINA		
Mr. Leung Woon-yin	Assistant Director-General (Engineering & Systems) Civil Aviation Department 10th Floor, Commercial Building AFFC 2 Chun Wan Road Hong Kong International Airport Hong Kong, China	Tel: 852-2591 5000 Fax: 852-2845 7160 E-mail: wyleung@cad.gov.hk
Mr. Burny Yung Yiu-wai	Operations Officer (Systems) Air Traffic Management Division Civil Aviation Department 4th Floor, Air Traffic Control Complex Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852-2910 6459 Fax: 852-2910 0186 E-mail: bywyung@cad.gov.hk
DPR KOREA		
Mr. Kim Chon Su	General Manager Air Koryo 4th Floor Charn Issara Tower 942/134 Rama IV Rd Bangkok 10500, Thailand	Tel: 02-234 2805 Mobile: 01-628 2816 Fax: 02-2675009
Mr. Pak Yun Jib	Station Manager Air Koryo 4/F Charn Issara Tower No. 1 Bangkok, Thailand	Mobile: 01-686 2725

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
FIJI		
Mr. Inia Sega	Manager ATS Operations Airports Fiji Limited Private Mail Bag Nadi International Airport Fiji Islands	Tel: (679) 6725 777 Fax: (679) 6725 161 E-mail: inias@afl.com.fj
Mr. Petero Delai	Development Engineer Airports Fiji Limited Private Mail Bag Nadi International Airport Fiji Islands	Tel: (679) 6731 725 or 6725 777 ext 4725 Fax: (679) 6722 492 E-mail: peterod@afl.com.fj
INDIA		
Mr. Hoshiar Singh Khola	Director General of Civil Aviation Directorate General of Civil Aviation DGCA Complex Opposite Safdarjung Airport New Delhi 110003 India	Tel: 91 11 462 0784 Fax: 91 11 462 9221 E-mail: dgoffice@dgca.delhi.nic.in
Mr. V.K. Chaudhary	General Manager (Communication) Airports Authority of India NSCBI Airport Kolkata 52 India	Tel: 91 33 511 9955 Fax: 91 33 511 8985 E-mail: gmce-com@vsnl.net
Mr. D.P. Arora	General Manager (S & P) Airports Authority of India Rajiv Gandhi Bhavan Safdarjung Airport New Delhi 110003 India	Tel: 91 11 464 5606 Fax: 91 11 461 1078 E-mail: gmspaai@vsnl.net
INDONESIA		
Mr. Novie Riyanto	Chief, Navigation & Calibration DGAC – Indonesia Jl. Merdeka Barat No. 8 Jakarta Pusat 10110 Indonesia	Tel: 62-21-3506451 Fax: 62-21-3507569 E-mail: novierianto@telekom.net

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Wiyono	Chief of Jakarta ATC Automation System PT (Persero) Angkasa Pura II Building 611 Soekarno-Hatta International Airport Jakarta, Indonesia	Tel: 62-21-550 6178 Fax: 62-21-550 1135 E-mail: dss97@centrin.net.id
Mr. Zulkifli Muslim	Chief of ATS Polonia Airport PT (Persero) Angkasa Pura II Bandara Polonia Medan, Indonesia	Tel: 62-61-456 5777 ext 2140 Fax: 62-61-456 1800 E-mail: zulumike@indosat.net.id
Mr. Susianto	Navaid & Radar Technical Manager PT (Persero) Angkasa Pura II 3/F, Head Office Bldg Soekarno-Hatta International Airport Jakarta, Indonesia	Tel: 62-21-550 5105 Fax: 62-21-550 2141 E-mail: electronics@angkasapura2co.id
Mr. Handri Santoso	Head of ACC Section PT (Persero) Angkasa Pura I (ATS Provider) Kota Baru BandarKemayoran Blok B12 Kaveling No. 2 Jakarta-Pusat 10610 Indonesia	Tel: 62-21-654 1961 ext 211 Fax: 62-21-654 1513 E-mail: opsllu@angkasapura1.co.id
JAPAN		
Mr. Takashi Arima	Special Assistant to the Director Air Traffic Services System Planning Division Air Traffic Services Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki, Chiyoda-ku Tokyo 100 8918, Japan	Tel: 81-3-5253 8739 Fax: 81-3-5253 1663 E-mail: arima-t2cv@mlit.go.jp
Mr. Kazuto Kishida	Facility Planning Section Air Traffic Services System Planning Division Air Traffic Services Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki, Chiyoda-ku Tokyo 100 8918 Japan	Tel: 81-3-5253 8739 Fax: 81-3-5253 1663 E-mail: saeki-k2ki@mlit.go.jp

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
MALAYSIA		
Mr. Zulkefli Harun	Deputy Director (ATC Operations) Department of Civil Aviation ATC Tower Complex KL International Airport 6410 KLIA Malaysia	Tel: (603) 8787 4118 Fax: (603) 8926 5989 E-mail: zulharun@hotmail.com atcklia@tm.net.my
Mr. Razak Ali	Air Traffic Control Officer Air Traffic Control Center Department of Civil Aviation SAAS Int'l Airport 47200 Subang Selangor, Malaysia	Tel: (603) 7846 5233 Fax: (603) 7846 3572 E-mail: razatc@hotmail.com
MONGOLIA		
Mr. Manlai Sedbazar	Technical Manager Civil Aviation Authority of Mongolia Buyant Ukhaa Airport Ulaanbaatar 34 Mongolia	Tel: 976-11-98 2048 Fax: 976-11-37 9981 E-mail: manlai@mcaa.gov.mn
Mr. Purevsukh Purvee	Specialist, ATS Department Civil Aviation Authority of Mongolia MCAA, Buyant Ukhaa Airport Ulaanbaatar 34 Mongolia	Tel: 976-11-98 2021 Fax: 976-11-37 9981 E-mail: purevsukh@mcaa.gov.mn
NEPAL		
Mr. Rajesh Raj Dali	Deputy Director General Civil Aviation Authority of Nepal Head Office, Babar Mahal P.O. Box 12646 Kathmandu Nepal	Tel: 977-1-262326 Res: 977-1-520577 Fax: 977-1-262518 E-mail: cnsatm@mos.com.np
Mr. Surya Bahadur Raut	Senior Technical Officer Civil Aviation Safety & Security Div. Ministry of Culture, Tourism and Civil Aviation Singh Durbah Kathmandu, Nepal	Tel: 977-1-246185, 225870 Res: 977-1-483097 Fax: 977-1-227758 E-mail: motca@mos.com.np

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Kamalesh Kumar Verma	Chief Officer Civil Aviation Authority of Nepal Head Office, Babar Mahal GPO Box 12488 Kathmandu Nepal	Tel: 977-1-262326, 262518 Res: 977-1-492243 Fax: 977-1-262516 E-mail: cnsatm@mos.com.np
NEW ZEALAND		
Mr. Rodney Bracefield	Manager CNS/ATM Civil Aviation Authority of New Zealand P.O. Box 31-441 Lower Hutt, New Zealand	Tel: 64-4-560 9400 Fax: 64-4-566 2525 E-mail: bracefieldr@caa.govt.nz
Mr. Greg Atkins	ATS Manager Airways Corporation of New Zealand Ltd. P.O. Box 14-131 Christchurch, New Zealand	Tel: 64-3-3581698 Fax: 64-3-3582790 E-mail: atkinsg@airways.co.nz
PAPUA NEW GUINEA		
Mr. Tars Bola	Manager ATS Operations Civil Aviation Authority P.O. Box 684 Boroko – NCD Papua New Guinea	Tel: 675-3244666 Fax: 675-3250749 E-mail: tbola@datec.com.pg
Mr. Stephen Orea	Manager ATS Technical Services Civil Aviation Authority P.O. Box 684 Boroko – NCD Papua New Guinea	Tel: 675-3244550 Fax: 675-3251941 E-mail: sorea@datec.net.pg
PHILIPPINES		
Engineer Andrew B. Basallote	Project Manager, New CNS/ATM Development Project Airways Navigation Service Air Transportation Office Department of Transportation and Communications Old MIA Road corner Ninoy Aquino Ave Pasay City, Metro Manila-1300, Philippines	Tel: 632-8318083 Fax: 632-7592739 E-mail: abasallote@ato.gov.ph abasallote@hotmail.com

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Conrado G. Rosales, Jr.	Chief, Airspace and Traffic Management Division Air Traffic Service Air Transportation Office Department of Transportation and Communications MIA Road, Pasay City Metro Manila -1300 Philippines	Tel: 632-832 0906 Fax: 632-877 1109 loc 3026 E-mail: crosalesjr@atmd.ats.ato.gov.ph
SINGAPORE		
Mr. Louie Cheng Hong Wing	Engineer (Navaids) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: 65-65412406 Fax: 65-65422447 E-mail: cheng_hong_wing@caas.gov.sg
Mr. Kwek Chin Lin	Project Officer (Systems) Civil Aviation Authority of Singapore Singapore Air Traffic Control Centre 60 Biggin Hill Road Singapore 509950	Tel: 65-65412664 Fax: 65-65456252 E-mail: kwek_chin_lin@caas.gov.sg
SRI LANKA		
Mr. Don Sarath Pullaperuma	Senior Air Traffic Controller Airport & Aviation Services (Sri Lanka) Limited Bandaranaike International Airport Colombo, Katunayake Sri Lanka	Tel: 94-1-635105 Fax: 94-1-635105 E-mail: rmsaasl@slt.lk
Mr. Dilantha Weeraratne	Flight Operations Manager Route Planning & Fuel Management Flight Operations Division Sri Lankan Airlines Bandaranayake International Airport Katunayake, Sri Lanka	Tel: 94-732 529 Fax: 94-735 211 SITA: CMBORUL E-mail: dilantha.w@airlanka.com
THAILAND		
Dr. Danai Lekhyananda	Senior Air Transport Economic Advisor Ministry of Transport and Communications Ratchadamnoen Nok Avenue Bangkok 10100, Thailand	Tel: 66-2-283 3139 Fax: 66-2-281 8958 E-mail: danai@motc.go.th

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Nimitr Sritirat	Chief of Project and Technical Branch Air Navigation Facilities Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-287 2634 Fax: 66-2-287 2634 E-mail: snimitr@aviation.go.th
Mr. Suchart Hiratyabat	Senior Engineer Air Navigation Facilities Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-287 2634 Fax: 66-2-287 2634 E-mail: suchart_h@thaimail.com
Mr. Vanchai Srimongkol	Chief of Communication Branch Communication and Air Traffic Control Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-286 2909 Fax: 66-2-286 2909 E-mail: svanchai@aviation.go.th
Miss Tawika Yodnuan	Air Transport Technical Officer Communication and Air Traffic Control Division Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-286 2909 Fax: 66-2-286 2909 E-mail: tawika@aviation.go.th
Mr. Takashi Kuratomi	JICA Expert Department of Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: 66-2-287 0320-9 (ext 1288) Mobile: 66-1-755 3147 Fax: 66-2-286 4523 E-mail: kuratomi@aviation.go.th
Mr. Kumtorn Sirikorn	Vice President, Air Traffic Service Operations Bureau Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-2859905 Fax: 66-2-2859995 E-mail: kumtorn@aerothai.or.th
Mr. Prakit Suwannabhokin	General Administrative Manager Air Traffic Service Operations Bureau Aeronautical Radio of Thailand Ltd 102 Ngamduplee, Tungmahamek Sathorn, Bangkok, Thailand 10120	Tel: +66-2-285 9076 Fax: +66-2-285 9648 E-mail: prakit.su@aerothai.or.th

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Aphinun Vannangkura	Director, Area Control Centre Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-2859057 Fax: 66-2-2859489 E-mail: aphinun@aerothai.or.th
Mr. Choosit Kuptaviwat	General Administrative Manager Vice President Office Air Traffic Service Engineering Bureau Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-285 9457 Fax: 66-2-285 9538 E-mail: choosit.ku@aerothai.or.th TLX: AEROT 82852 TH AFTN: VTBBYFYX SITA: BKKTOYF
Mr. Chainan Chaisompong	System Engineer Planning and Project Department Aeronautical Radio of Thailand Ltd. 102 Ngarmduplee Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-287 8391 Fax: 66-2-285 9486 E-mail: chainan.ch@aerothai.or.th TLX: AEROT 82852 TH AFTN: VTBYFYX SITA: BKKTOYF
UNITED STATES		
Mr. Theodore Davies	Program Director, ASD-500 International Research & Acquisitions Division Federal Aviation Administration 800 Independence Ave, SW Washington, DC 20591 U.S.A.	Tel: 1-202-267 7889 Fax: 1-202-267 5071 E-mail: ted.davies@faa.gov teddavies@aol.com
Mr. Dennis R. Beres	Asia/Pacific Representative, ASD-500 Communications, Navigation and Surveillance Federal Aviation Administration Asia Pacific Office P.O. Box 50109 Honolulu, Hawaii 96850 U.S.A.	Tel: 1-808-541 1244 Fax: 1-808 541 3462 E-mail: dennis.beres@faa.gov
Mr. Michael Lam	International Executive Liaison Federal Aviation Administration 800 Independence Ave S.W. Washington, D.C. 20591 U.S.A.	Tel: 1-202-267 8055 Fax: 1-202-267 5120 E-mail: Michael.lam@faa.gov

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
VIET NAM		
Mr. Hoang Xuan Hue	Deputy Director General Vietnam Air Traffic Management Civil Aviation Administration of Vietnam Gialam Airport Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8273484 Fax: 84-4-8272597
Mr. Nguyen Manh Quang	Deputy Chief ATS-AIS of VATM Civil Aviation Administration of Vietnam Gialam Airport – Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8730320 Fax: 84-4-8272597 E-mail: vatmats@hn.vnn.vn
Mr. Hoang Huu Lich	Officer in Charge of CNS Civil Aviation Administration of Vietnam Gialam Airport – Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8274191 Fax: 84-4-8274194 E-mail: khongvan@vol.vnn.vn
Mr. Nguyen Hoa Binh	Deputy Ho Chi Minh AACC Project Manager Civil Aviation Administration of Vietnam 58 Truong Son, Tan Binh district Ho Chi Minh City The Socialist Republic of Vietnam	Tel: 84-8-8442710 Fax: 84-8-445201 E-mail: daaacchcm@hcm.vnn.vn
Mr. Le Ngoc Thanh	Flight Operation Engineering Vietnam Airlines Gialam Airport – Hanoi The Socialist Republic of Vietnam	Tel: 84-4-8273916 Fax: 84-4-8272916
IATA		
Mr. Neil Jonasson	Assistant Director Operations & Infrastructure – Asia/Pacific International Air Transport Association 77 Robinson Road #05-00, SIA Building Singapore 068896	Tel: 65-6239 7262 Fax: 65-6536 6267 E-mail: jonassonn@iata.org
Mr. Owen B. Dell	Manager International Operations Cathay Pacific Airways Limited International Affairs Department 9/F Central Tower, Cathay Pacific City 8 Scenic Road Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852 2747 8829 Fax: 852 2141 8829 SITA: HKGOOCX E-mail: owen_dell@cathaypacific.com

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Capt. Aric Oh	Management Pilot (Technical) Singapore Airlines Ltd. SIA Training Centre 720 Upper Changi Road East Singapore 486852	Tel: +65-6540 3693 Fax: +65-65429564 E-mail: aric_oh@singaporeair.com.sg
IFALPA		
Capt. Suresh Menon	Regional Vice President, Asia/East IFALPA 24, Pasir Ris Heights Singapore 519231	Tel: 65-6582 2593 Fax: 65-6584 8869 E-mail: menon@pacific.net.sg
IFATCA		
Mr. Kevin Broome	Technical Representative IFATCA 36A Colemans Rd Springlands Blehheim, New Zealand	Tel: 64-3-5788096 Fax: 64-3-5788096 E-mail: kbroome@ihug.co.nz
ICAO		
Mr. John E. Richardson	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: jrichardson@bangkok.icao.int
Mr. K.P. Rimal	Regional Officer, CNS ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: krimal@bangkok.icao.int
Mr. Ron Rigney	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: rrigney@bangkok.icao.int

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Hiroshi Inoguchi	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: hinoguchi@bangkok.icao.int
Mr. Li Peng	Regional Officer, CNS ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 Fax: 66-2-5378199 AFTN: VTBBICOX SITA: BKKCAYA E-mail: pli@bangkok.icao.int

LIST OF WORKING AND INFORMATION PAPERS

WORKING PAPERS

WP No.	Date	Agenda Item	Presented by	Subject
1	11/3/02	1	Secretariat	Provisional Agenda
2	4/3/02	3	Secretariat	CNS/ATM Implementation and Planning Matrix
3	11/3/02	3	Singapore	ICAO Regional GNSS Measurement Campaign
4	11/3/02	3	Australia	Automatic Dependent Surveillance Broadcast (ADS-B) in Australia
5	11/3/02	13	Secretariat	Action on Conclusions/Decisions of APANPIRG/12
6	11/3/02	4	Australia	Extended Squitter
7	11/3/02	4	Secretariat	Key CNS/ATM Implementation Priorities
8	11/3/02	10	Australia	Aviation Environment Policy
9	12/3/02	5	Secretariat	Dissemination of Aeronautical Information
10	12/3/02	14	Secretariat	CNS/ATM/IC/SG Terms of Reference and Work Programme
11	12/3/02	5	Secretariat	Development of a Framework for Inter-Regional Co-ordination (IRC) Meetings
12	13/3/02	8	Secretariat	List of Deficiency in the CNS and ATM Fields
13	13/3/02	9	Secretariat	Action Items arising from the 38th Conference of DGCA
14	12/3/02	3	Australia	Selection of GPS Receiver Standard for GNSS Implementation

INFORMATION PAPERS

IP No.	Date	Agenda Item	Presented by	Subject
1	11/3/02	-	Secretariat	List of Working and Information papers
2	21/1/02	3	Philippines	CNS/ATM Implementation Program in the Philippines
3	11/3/02	2	Secretariat	Asia/Pacific Regional Plan for the New CNS/ATM Systems, Draft Issue – 6
4	11/3/02	4	United States	Asia/Pacific Ground/Ground ATN Routing Architecture
5	11/3/02	4	United States	Ultra-Wideband Technology

IP No.	Date	Agenda Item	Presented by	Subject
6	11/3/02	4	United States	Aeronautical Telecommunication Network (ATN) Service with Japan including connectivity trials
7	11/3/02	4	United States	U.S. Satellite Navigation Program Status
8	11/3/02	3	United States	Status of Safe Flight 21
9	11/3/02	3	New Zealand	FMS Arrival Procedure Trial at Auckland International Airport
10	11/3/02	3	Fiji	Update on the new CNS/ATM Implementation – Fiji's EUROCAT 2000X ATM System
11	7/3/02	3 & 5	Secretariat	Review of Comparison Status of Regional Developments of Air Navigation Systems including CNS/ATM Systems
12	11/3/02	7	New Zealand	Business Planning and Reporting in the Civil Aviation Authority of New Zealand
13	11/3/02	4	United States	World Radiocommunication Conference (WRC) 2003
14	11/3/02	3	Japan	Recent CNS/ATM Activities in Japan
15	7/3/02	3	Secretariat	Development of Regional ATN Planning Documents
16	7/3/02	3	Secretariat	ICAO Policies and Practices related to CNS/ATM Systems
17	11/3/02	3	Australia	Update on the regulatory reform program in the Civil Aviation Safety Authority, Australia
18	11/3/02	3	United States	GNSS Implementation Regional Meetings (27 August – 8 September 2001) and GNSS Implementation Team Meeting Report (Los Angeles, California, 26 February – 1 March 2002)
19	11/3/02	7	New Zealand	New Zealand Air Traffic Management Direction
20	11/3/02	3	Hong Kong, China	CNS/ATM Systems Development in Hong Kong, China
21	11/3/02	3	Hong Kong, China	Hong Kong, China's Experience in ATN Trials
22	11/3/02	4	United States	Interference Impacting Aeronautical Air Traffic Control Frequencies caused by Unauthorized High Power Cordless Telephones
23	11/3/02	3	China	Progress of CNS/ATM Implementation
24	11/3/02	3	Nepal	CNS/ATM Implementation in The Kingdom of Nepal
25	11/3/02	2	Australia	Australian Air Traffic Management Strategic Plan
26				*INTENTIONALLY LEFT BLANK*

IP No.	Date	Agenda Item	Presented by	Subject
27	11/3/02	3	Australia	Lateral Offsets in the South Pacific
28	12/3/02	5	Secretariat	Report on Europe/Middle East/Asia Route Structure – South-of-the-Himalayas (EMARSSH) Phase One Implementation and Progress of Overall Implementation
29	12/3/02	3	Mongolia	ADS-C/ADS-B Combined Demonstration
30	12/3/02	15	Secretariat	Major Air Navigation Services Development in the South China Sea Area
31				*INTENTIONALLY LEFT BLANK*
32	14/3/02	13	Chairmen	Work Program Review and Issues
Flimsy No. 1 to IP/9	13/3/02	3	New Zealand	FMS Arrival Procedure Trial at Auckland International Airport

…………………….