



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

**REPORT OF THE SEVENTH MEETING
COMMUNICATIONS, NAVIGATION AND SURVEILLANCE/
METEOROLOGY SUB-GROUP (CNS/MET/SG/7)
AND
THE TENTH CNS/ATM IMPLEMENTATION COORDINATION SUB-GROUP
(CNS/ATM/IC SG/10) MEETINGS OF APANPIRG**

BANGKOK, THAILAND 15 – 21 JULY 2003

The views expressed in this Report should be taken as those of the Sub-Group and not of the Organization. This Report will be submitted to the APANPIRG/14 Meeting and any formal action taken will be published in due course as a Supplement to the Report of the APANPIRG Meeting.

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

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1. Introduction

1.1 The Seventh Meeting of the Communications, Navigation and Surveillance/Meteorology Sub-Group (CNS/MET/SG/7) and the Tenth Meeting of the Communications, Navigation, Surveillance and Air Traffic Management Implementation Coordination Sub-Group (CNS/ATM/IC SG/10) of Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) was held jointly in Bangkok, Thailand from 15 to 21 July 2003.

2. Attendance

2.1 The meeting was attended by 81 experts from 22 States, WMO, IATA, IFALPA and SITA. A list of participants is in Attachment 1.

3. Opening of the Meeting

3.1 On behalf of Mr. L B. Shah, Regional Director, ICAO Asia and Pacific Office, Mr. K.P. Rimal, welcomed all participants to Bangkok and highlighted the objectives of the meeting. He stated that the joint meeting of the two Sub-Groups is expected to eliminate duplication of efforts and would facilitate better coordination of activities. He further stated that the deliberations at the meeting would assist States in providing needed regional inputs at the Eleventh Air Navigation Conference.

3.2 Mr. Rodney Bracefield, Chairman of the CNS/ATM/IC Sub-Group was not able to attend the meeting due to unforeseen official engagement. He had also expressed his regret that he would not be able to continue to work as Chairman at future meetings. The meeting paid tribute to Mr. Bracefield for his contribution and all the work carried out by him as a Chairman of the CNS/ATM/IC/Sub-Group. The meeting also wished him success in his future endeavors.

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

4. Officers and Secretariat

4.1 Mr. Jeffrey Bollard acted as Chairman of the meeting. Mr. Shun Chi-ming, Senior Scientific Officer of Hong Kong Observatory and Mr. R. C. Khurana, General Manager, ATM of Airports Authority of India were elected as Vice- Chairmen of the meeting.

4.2 Mr. Lo Weng Kee, Senior Electronic Engineer of Civil Aviation Authority of Singapore, the Vice Chairman of the CNS/MET Sub-Group also attended the meeting.

4.3 Mr. K .P. Rimal, Regional Officer, CNS and Mr. David Moores, Regional Officer ATM acted as Secretaries of the meeting who were assisted by Mr. Dimitar H. Ivanov, Regional Officer, Aeronautical Meteorology, Mr. Li Peng, Regional Officer, CNS and Mr. John Richardson, Regional Officer ATM.

5. Agenda of the Meeting

5.1 The agenda adopted by the meeting was as follows:

Agenda Item 1: Adoption of provisional agenda and working arrangements for the combined meeting of the CNS/ATM/IC and CNS/MET Sub-Groups

Agenda Item 2: Review:
1) action on the reports of CNS/MET/SG/6 and CNS/ATM/IC/SG/9 meetings
2) action items of the 39th DGCA Conference related to CNS/ATM system

- Agenda Item 3:** Aeronautical Fixed Service
1) review report of ATN Transition Task Force
2) review report of AIDC Review Task Force
- Agenda Item 4:** Aeronautical Mobile Service
1) review agenda item 7 of AN-Conf/11
2) review operation of CPDLC
- Agenda Item 5:** Radio Navigation Aids
1) review strategies for Precision Approach and Landing Guidance Systems and GNSS Implementation;
2) review agenda items 6 of AN-Conf/11
- Agenda Item 6:** Surveillance
1) review report of ADS-B study and Implementation Task Force
2) review surveillance systems
- Agenda Item 7:** Aeronautical electromagnetic spectrum utilization:
1) review agenda item 5 of AN-Conf/11
- Agenda Item 8:** Review:
1) implementation of ISCS and SADIS
2) transition to the final phase of WAFS
- Agenda Item 9:** Exchange of OPMET Information
- Agenda Item 10:** Implementation of ICAO Warning Systems

1) International Airways Volcano Watch (IAVW)
2) tropical cyclone advisories and warnings
- Agenda Item 11:** Quality assurance in the MET field
- Agenda Item 12:** MET support for operations at aerodromes and terminal areas
- Agenda Item 13:** Review developments, research, trial and demonstration relating to CNS/ATM
- Agenda Item 14:** Review and identify key priorities in the CNS/ATM implementation
- Agenda Item 15:** Review and update the ASIA/PAC Regional Plan for the CNS/ATM systems.
- Agenda Item 16:** Safety and security in Air Traffic Management
1) review Agenda Item 2 of AN-Conf/11
- Agenda Item 17:** Air Traffic Management Operational Concept
1) review Agenda Item 1 of AN-Conf/11
- Agenda Item 18:** Consider CNS/ATM training needs.
- Agenda Item 19:** Consider environmental issues related to CNS/ATM system.
- Agenda Item 20:** Review progress on the establishment of a Regional Airspace Safety Monitoring Agency (RASMA).

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- Agenda Item 21:** Review and identify deficiencies in the ATM/CNS/MET fields
- Agenda Item 22:** Future Work Programme
- 1) review Task List of the CNS/MET/SG
 - 2) review the work programme of the CNS/ATM IC SG
 - 3) contributory bodies of APANPIRG and other Co-ordination Groups
- Agenda Item 23:** Any other business

6. Organization, Working arrangement, Language and Documentation

6.1 The working language was English inclusive of all documentation and this report. The CNS/ATM and MET Working Groups met separately from 15 to 19 July 2003 to deal with the specific tasks. A list of Working Papers and Information Papers presented at the meeting is at Attachment 2.

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

- 1) Ensure the continuing and coherent development of the ASIA/PAC Regional Air Navigation Plan and the ASIA/PAC Regional Plan for the New CNS/ATM System in the CNS/MET field;
- 2) Review and identify deficiencies that impede the implementation or provision of efficient CNS/MET services in the ASIA/PAC region;
- 3) Monitor CNS/ATM system research and development, trials and demonstrations in the fields of CNS/MET and facilitate the transfer of this information and expertise between States;
- 4) Make specific recommendations aimed at improving CNS/MET services by the use of existing procedures and facilities and/or through the evolutionary implementation of CNS/ATM system; and
- 5) Review and identify inter-regional co-ordination issues in the fields of CNS/MET and recommend actions to address those issues.

8. Terms of Reference of the CNS/ATM /IC Sub-Group

- 1) Review and update, on a regular basis, the “Asia/Pacific Regional Plan for the New CNS/ATM System” and ensure the harmonization with the Global Air Navigation Plan for CNS/ATM System;
- 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 system;
- 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 system under development and implementation;
- 4) Identify key priorities for implementation of CNS/ATM for the ASIA/PAC region, co-ordinate and monitor implementation;

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- 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 system and reduced separation minima, and co-ordinate with other regional monitoring agencies;
 - 7) Develop guidance material for the applicability of the ICAO ATM Concept in the ASIA/PAC region, taking into account national planning;
 - 8) Develop business cases for various options of CNS/ATM implementation taking into account environmental benefits;
 - 9) Develop a framework for regional training plans for the introduction of CNS/ATM system and to include this material in the “Asia/Pacific Regional Plan for the New CNS/ATM System”; and
 - 10) To monitor environmental issues relating to the implementation of CNS/ATM systems, in particular, the work of the ICAO’s Committee on Aviation Environmental Protection (CAEP), to disseminate relevant information to Contracting States, and to carry out appropriate coordination with Contracting States.

9. Conclusions and Decisions - Definition

9.1 The Sub-Group of APANPIRG records its actions in the form of draft Conclusions and Decisions with the following significance:

- a) Draft Conclusions deal with matters which, in accordance with the Sub-Group’s Terms of Reference, require the attention of States or actions by ICAO in accordance with establishment procedures;
- b) Draft Decisions relate solely to matters dealing with the internal working arrangements of APANPIRG and its contributory bodies; and
- c) Decisions relate solely to matters dealing with internal working arrangement of the Sub-Group only.

Note: Decisions and Conclusions have been numbered sequentially with the prefix of 7-10 signifying the Seventh Meeting of the CNS/MET Sub Group and the Tenth Meeting of the CNS/ATM/IC Sub Group. This practice has been adopted to facilitate reference at the future meetings of the Sub Groups

Reference No.	Title	Page
Draft Decisions:		
7-10/5	Revision of the Subject/Tasks List of the ATN Transition Task Force	8
7-10/9	Revision of the Terms of Reference of ADS-B Study and Implementation Task Force	21
7-10/30	Task Force on the implementation of volcanic ash and tropical cyclone advisories and warnings (VA/TC Implementation TF)	45
7-10/39	Amendment to the key priorities for implementation of the CNS/ATM systems for the ASIA/PAC Region	65
7-10/40	Update Subject/Tasks List of the CNS/MET Sub-Group	82
7-10/41	Establishment of a Task Force to review and revise as appropriate the Terms of Reference and work programme of the CNS/ATM/IC Sub-Group on a task orientated basis	83
Draft Conclusions:		
7-10/1	ASIA/PAC Interface Control Document (ICD) for ATN Router	5
7-10/2	ATN Documentation Tree	5
7-10/3	ASIA/PAC ATN Inter Domain Routing Policy (IDRP)	6
7-10/4	Use of Public Internet to support AFTN	7
7-10/6	Use of SATCOM voice for ATS	16
7-10/7	Inclusion of Seoul in MWARA NCA-3	17
7-10/8	Updated Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC Region	19
7-10/10	Near term ADS-B Data link selection	21
7-10/11	Preparation for World Radio Communication Conference 2007 (WRC-2007)	25
7-10/12	Authorized users of the SADIS and ISCS/2 Satellite Broadcasts in ASIA/PAC Region – FASID Table MET 7	26
7-10/13	Implementation of the SADIS second-generation system (SADIS 2G)	26

Reference No.	Title	Page
Draft Conclusions (Cont'd)		
7-10/14	Discontinuation of the current first-generation SADIS two-way VSAT programme	27
7-10/15	SADIS strategic assessment tables	27
7-10/16	Use of the SADIS Internet Back-up Service by ISCS User States	30
7-10/17	Cost Recovery for the utilization of WAFS by the States	31
7-10/18	States' Actions for the Migration to the new ISCS and the Operational Use of GRIB and BUFR coded WAFS Products	33
7-10/19	Automatic Production of SIGWX Charts from BUFR Coded WAFS Products	34
7-10/20	GRIB/BUFR Training	35
7-10/22	Amendment of regional procedures related to WAFS in the ASIA/PAC Basic ANP and FASID	36
7-10/23	Notification for significant changes in the WAFS operation	36
7-10/24	Updated ROBEX Tables	38
7-10/25	Inclusion of 9-hour TAF in the ROBEX exchange	41
7-10/27	ASIA/PAC Regional SIGMET Guide	42
7-10/28	Amendments to the SIGMET format	43
7-10/31	Harmonization of the format of volcanic ash and tropical cyclone advisories	45
7-10/32	Amendment to FASID Table MET 1B in regard to the service provided by the meteorological watch office Wellington	46
7-10/33	Implementation of the requirement for TC advisories by TCAC New Delhi	47
7-10/34	Further development of the ICAO provisions for the tropical cyclone advisories and SIGMETs	48
7-10/35	Application of Mode-S Data link in automatic weather reporting	60
7-10/37	Fostering of exchanges between MET and ATM	62
7-10/38	Inter-regional ATS coordination meeting ASIA MID/EUR	65

Reference No.	Title	Page
Decisions:		
7-10/21	ASIA/PAC WAFS Implementation Task Force	35
7-10/26	OPMET Management Task Force	41
7-10/29	Regional SIGMET survey	43
7-10/36	ASIA/PAC METATM Task Force	61

**Agenda Item 1: Adoption of provisional agenda and working arrangements for the
combined meeting of the CNS/ATM/IC and CNS/MET Sub-Groups**

1.1 The meeting adopted the provisional agenda of the meeting with some editorial changes. The agenda adopted by the meeting is in pages i-1 to i-3. The meeting established CNS/ATM and MET Working Groups to deal with specific agenda items.

1.2 The meeting established an ad-hoc Working Group to conduct a review of the Terms of Reference of the CNS/ATM/IC Sub-Group and to update strategies for the provision of approach and landing guidance systems and GNSS navigation system.

Agenda Item 2: Review:

- 1) action on the reports of the CNS/MET SG/6 and CNS/ATM/IC SG/9 meetings; and**
- 2) action items of the 39th DGCA Conference related to CNS/ATM systems.**

Status of actions on the Report of the CNS/MET SG/6 Meeting

2.1 The meeting carried out a review of the actions taken by APANPIRG/13 meeting, Air Navigation Commission and the Council on Decisions and Conclusions formulated by the Sixth meeting of the CNS/MET Sub-Group and the Ninth meeting of the CNS/ATM/IC Sub-Group. Actions taken by States and the ICAO Secretariat were also reviewed. The meeting noted with satisfaction, actions taken on all the Decisions and Conclusions. The results of the review in the CNS/MET field are provided in Appendix A.

Status of actions on Report of the CNS/ATM IC SG/9 Meeting

2.2 The meeting reviewed result of actions taken by APANPIRG/13 on the Conclusions and Decisions formulated by the CNS/ATM/IC/SG/ 9 meeting as summarized below.

2.2.1 Conclusion 13/39 – 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.

The updated Asia/Pacific Regional Plan for the New CNS/ATM Systems was circulated to States and International Organizations. The plan is available on the ICAO Regional Office website:
<http://www.icao.int/apac/>.

2.2.2 Conclusion 13/40 – Selection of GPS receiver standard for GNSS implementation

That States,

- a) should give consideration for future GNSS operational approvals and associated operational implementation based on the TSO C145/146 receiver standard; and
- b) use of TSO C129 remains a valid standard but should not be considered as the basis for future implementation of GNSS.

The information on selection of GPS receiver standard for GNSS implementation was brought to the attention of States.

2.2.3 Conclusion 13/41 – Inclusion of ADS-B on the list of Key Priorities of the CNS/ATM Implementation in the ASIA/PAC Region

That, a task on ADS-B be included on the list of Key Priorities of the CNS/ATM Implementation in the ASIA/PAC Region.

ADS-B was included on the list of Key Priorities and revised at this meeting.

- 2.2.4 Decision 13/42 – Inclusion of a table of APANPIRG contributory bodies and associated groups in the APANPIRG report

That, a table of APANPIRG contributory bodies and associated groups be included in the report of APANPIRG meetings and be updated periodically by the APANPIRG Sub-Groups.

The meeting recalled that the table of APANPIRG contributory bodies and associated groups was provided by the Chairpersons of APANPIRG's three active Sub-Groups, ATS/AIS/SAR, CNS/ATM/IC and CNS/MET, who met in December 2001 and September 2002. The table was intended to assist APANPIRG maintain an overview to keep track of the activities of the bodies concerned. The meeting reviewed and updated the table.

- 2.2.5 Decision 13/43 – Amendment to the Terms of Reference of the CNS/ATM//IC/SG

That, the revised TORs of the CNS/ATM/IC/SG be adopted as shown in Appendix E to the Report on Agenda Item 3.

The meeting considered the terms of reference of the CNS/ATM/IC/SG and established an ad hoc working group to undertake a detailed review of the terms of reference and the work programme. It was agreed that the Sub-Group needed to adopt a task orientated approach to its work, and identify the tasks under the TORs that needed to be undertaken. Further detailed information on this matter is provided under Agenda Item 22: Future Work to this report.

- 2.2.6 Conclusion 13/44 – Support for States to establish safety management systems to meet the obligation of Annex 11

That, ICAO and States with safety management expertise support the implementation of Annex 11 safety management system requirements through holding seminars, workshops and the provision of guidance material.

The meeting was informed that a seminar on ATM safety management had been planned in the early part of 2003 in Beijing, but it was necessary to defer it and reschedule it in Bangkok in 2004. This would take advantage of the outcome of the eleventh Air Navigation Conference (AN-Conf/11) to be held in Montreal from 22 September to 3 October 2003. A seminar on runway incursion and ATM safety management has been scheduled from 3 to 7 December 2003 in Singapore hosted by the Civil Aviation Authority of Singapore.

- 2.2.7 Conclusion 13/45 – Continuation of the work of the Asia Pacific Airspace Safety Monitoring (APASM) Task Force to develop a Regional Airspace Safety Monitoring Agency (RASMA) for the ASIA/PAC Region

That, the APASM Task Force continue as a priority the development of an Asia Pacific Region RASMA in accordance with ICAO provisions. The amended Terms of Reference and composition of the Task Force are shown in the Appendix x to the Report on Agenda Item 3.

An update on the work of the APASM/TF is provided under Agenda Item 20 to this report.

Action items of the 39th DGCA Conference related to CNS/ATM systems

2.3 The meeting reviewed Action Items of the 39th DGCA Conference in the CNS/ATM field including expression of strong support for resolution of air navigation deficiencies. Support to the ICAO Position for WRC 2003 provided in Action Item 39/5 was considered to be one of the main factors in securing and protecting required aeronautical spectrum at WRC 2003.

2.4 New Zealand presented details of actions taken in response to the Action Items 39/4 relating to implementation of ACAS and Terrain Awareness and Warning System (TAWS), Action Item 39/6 relating to resolution of deficiencies and Action Item 39/9 relating to adherence by New Zealand to the ICAO provisions laid down in Annex 10 with regard to allocation of 24 bit aircraft address.

- Agenda Item 3: Aeronautical Fixed Service**
1) review report of ATN Transition Task Force
2) review report of AIDC Review Task Force

Review of the ATN Transition Task Force meeting report

3.1 Under this agenda item the meeting reviewed the work accomplished by the Fifth Meeting of the ATN Transition Task Force which was held in Phuket, Thailand 9 to 13 June 2003. The meeting had formulated 1 Draft Decision and 4 Draft Conclusions.

3.2 The meeting reviewed a draft Asia/Pacific Regional Interface Control Document (ICD) for ATN ground-to-ground Router finalized by the Fifth ATN Transition Task Force meeting and endorsed the following Draft Conclusion:

**Draft Conclusion 7-10/1 - ASIA/PAC Interface Control Document (ICD)
for ATN Router**

That, the ASIA/PAC regional ICD for ATN Router provided in Appendix B
be adopted and published.

3.3 The meeting agreed to adopt the ATN Documentation Tree, updated by the Task Force which provides an index and hierarchy on available ATN related documents. The meeting recommended that this document, shown in Appendix C be considered for inclusion in the Second Edition of the ATN Planning and Technical Document. In view of the foregoing the meeting endorsed the following draft conclusion:

Draft Conclusions 7-10/2 - ATN Documentation Tree

That, the updated ATN Documentation Tree provided in Appendix C be
adopted and included in the Second Edition of the ATN Planning and
Technical Document.

3.4 The meeting reviewed the draft ASIA/PAC ATN Inter Domain Routing Policy (IDRP) developed by the Task Force.

3.4.1 The detailed policy requirements and recommendations specified in the Asia/Pacific ATN IDRP Routing Policy were derived from the general routing policy goal of providing global shortest path connectivity with a minimal exchange of routing information. The Routing Policy had explicit requirements for backbone routers as well as a number of recommendations for non-backbone routers intended to meet the above policy goal. It was considered as first release and complete routing policy for the ground/ground element of ATN.

3.4.2 The ASIA/PAC ATN IDRP Routing Policy document allows States/Organizations to have additional local routing policies. Such policies may include various local preferences or Quality of Service based routing, for example, routing based on line error rates, delay, capacity, and priority.

3.5 In view of the above, the meeting agreed to recommend for adoption of the ASIA/PAC IDRP by APANPIRG and endorsed the following draft conclusion:

Draft Conclusion 7-10/3 -ASIA/PAC ATN Inter Domain Routing Policy (IDRP)

That, the ASIA/PAC ATN Inter Domain Routing Policy (IDRP) provided in Appendix D be adopted and distributed to States.

3.6 It was also recommended that if administrations within the ASIA/PAC region wish to pursue the implementation of the TCP/IP subnet as part of the ATN, they should be able to do so through bilateral agreements on the understanding that they may be required to make changes to their subnets if and when the TCP/IP subnet is developed as part of the ATN SARPs.

3.7 The meeting agreed to the proposal made by Fiji and confirmed by the Task Force to designate Nadi as BBIS - Backbone Boundary Intermediate System. It was agreed that changes will be made in the Table, accordingly.

3.8 While reviewing the ATS Message Handling Services (ATSMHS) Plan – Table CNS-1C, the meeting identified the need for changes in the Explanation of the Table and some terms used in the table in order to keep consistencies with other AMHS related technical documents. The meeting reviewed ATSMHS plan based on the existing Table CNS-1C and developed a sample format for Table CNS-1C based on the description given in the samples. It was agreed to present the plan for further comment at the next meeting of Ad Hoc Working Group to be held in November 2003. The Working Group would incorporate the resulting comments and present it to the next meeting of the Task Force for adoption.

**Development of guidance material for the use of the Public Internet
Technology to support AFTN**

3.9 The meeting reviewed the guidance material developed by the Task Force for the use of the public Internet technology to support low speed AFTN. It was identified that various issues need to be addressed before implementing a system that uses the Internet as a delivery mechanism for AFTN. These areas include conducting a safety case analysis that identifies risks and mitigation plans, ensuring that security measures are implemented in order to protect the integrity of the AFTN from external unauthorized users. The use of appropriate logging and audit reporting required ensuring conformity and integrity of the service. The guidance material also identifies the need for appropriate contract agreements to be put in place with end users to ensure that they do not abuse or allow the system to be misused.

3.10 It was also recognized that before considering the development and implementation of a system that utilizes the Internet for delivery of AFTN, a Safety Hazard Analysis must be conducted. The Safety Hazard Analysis should identify hazards and risks. Once the risks are identified they must be mitigated.

3.11 The Secretariat informed the meeting that the Aviation Use of the Public Internet Study Group (AUPISG) is being established by ICAO to assist ICAO Secretariat in conducting study for aviation use of public Internet and to develop guidelines and other relevant provisions.

3.12 The meeting appreciated the efforts made by the Task Force in completing this task in time. The meeting reviewed the guidance material and agreed to make recommendation to APANPIRG for its adoption as an interim arrangement pending outcome of the result of the study conducted by AUPISG.

In view of the above, the meeting endorsed the Draft Conclusion as follows:

Draft Conclusion 7-10/4 – Use of Public Internet to support AFTN

That, the guidance material for the use of Public Internet to support low speed AFTN circuits provided in Appendix E be adopted and circulated for States for use as an interim means pending the outcome of the result of Aviation Use of Public Internet Study Group.

AMHS trials

3.13 It was suggested that all States and/or administrations, especially those who are nominated as BBIS sites in the Region to implement systems according to the schedule listed in ATN Router plan and AMHS plan. States were also advised to establish their implementation schedule in a realistic and practical manner.

3.14 To comply with the Regional Implementation Plan, close liaison was initiated by relevant ATS authorities concerned. The trial status were as follows:

- Beijing, China – to continue further ATN technical trials with Hong Kong, China from July 2003 with router developed by Beijing;
- Hochiminh, Vietnam – to carry out AMHS technical trial with Hong Kong, China as from early 2004;
- Tokyo, Japan – to implement ATN and AMHS with Hong Kong, China in September 2004, with pre-operational trials starting from end 2003;
- Manila, Philippines – to carry out ATN/AMHS joint trials with Hong Kong, China in the 3rd quarter of 2004; and
- Taipei – to commence ATN/AMHS trials with Hong Kong, China in 2004.

3.15 Subject to thorough operational trials, Hong Kong, China is planning to launch the new 64 Kbps ATN link for operational use with Bangkok, Thailand in late 2003.

FAA/JCAB ATN/AMHS implementation activities

3.16 The meeting noted that the FAA and JCAB have agreed to implement Air Traffic Message Handling Services (AMHS) service between the USA and Japan in March 2004. This will be the initial implementation of AMHS in the ASIA/PAC Region. The telecommunication connection between the US and Japan will be a point-point 64 kilobytes per second (kbps) circuit. It is planned to have both the AMHS and aeronautical fixed telecommunications network (AFTN) service operating in parallel in the event AHMS service is disturbed or interrupted. This service will be implemented between the FAA, Salt Lake Facility and Tokyo Area Control Center (ACC) -Narita airport.

AMHS trials in Singapore

3.17 The AMHS trial was carried out between Singapore and Hong Kong, China during the period end of April to end of June 2003. Singapore is planning to start similar trials with Thailand during the first quarter of 2004.

China/Fiji/PNG/USA Communication upgrade and trials

3.18 The USA informed the meeting of ATN trials with China and Fiji and voice improvements to reduce toll charges between Papua New Guinea and the Oakland Center. It was agreed by mutual agreement for the initial verification of the compatibility of the Air Traffic Message Handling Service (AMHS) application by testing Message Transfer Agent (MTA) to MTA using Connection Less Network Protocol (CLNP) with China including configuration and test procedures. AMHS trials between FAA and CAAC are planned for May 2004. The circuit between Fiji and the USA will be upgraded from 9600 bps to 64 Kbps in December 2003. It accommodates ATS voice, AFTN data, meteorological data and bandwidth allocations for AMHS and ATN testing. The Fiji and US have initiated informal technical discussions to begin AMHS trials in 2004. The USA is attempting to reduce the ATC telephone toll charges between Oakland ACC and Port Moresby flight information service (FIS) by proposing a direct speech circuit and AFTN connection in a cost effective manner.

Validation of ICDs

3.19 As the AMHS and Router trials were going on it was agreed that States/Administrations, in a position to do so, undertake the task of carrying out validation of the relevant ICDs adopted by APANPIRG and report results at the next Meeting Task Force.

Review the Subject/Tasks List of the ATN Transition Task Force and develop future work of the Task Force

3.20 The meeting noted that the following tasks identified by the Task Force in its effort to further the implementation planning of the ATN AMHS and included the tasks in the updated Task List of the Task Force.

- i) AMHS Naming Registration; and
- ii) AFTN/AMHS Operational Procedures

3.21 The meeting reviewed the Subject Task List of the Task Force which took account of the relevant items of the Key Priorities for the CNS/ATM implementation approved by APANPIRG/13. It was noted that the Router ICD identified in the item 1) of the Task No. 6 was completed and the Task No. 7 regarding the use of Public Internet was also completed.

3.22 It was also noted that the target date of completion of other items were reviewed and updated. Two new tasks No. 9 and 10 proposed to be undertaken were included in the Tasks List.

3.23 In view of the above, the Subject/Tasks List of the ATN Transition Task Force were revised and the following Draft Decision was endorsed.

Draft Decision 7-10/5 – Revision of the Subject/Tasks List of the ATN Transition Task Force

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

Next Meeting

3.24 The meeting noted the offer made by Indonesia to host the 6th ATN Transition Task Force in April 2004 at Bali, Indonesia

ATN Seminar/Workshop

3.25 The meeting also appreciated the offer made by Thailand to host an ATN Seminar/Workshop in Chiang Mai, Thailand during early 2004. The exact date will be coordinated with the Secretariat during November 2003.

AFTN Improvements

3.26 The AFTN plan was reviewed and the status of implementation was updated. The main highlights of the AFTN improvements made during the year 2002 and early 2003 were as follows:

- Apia-Faleolo/USA 2400 bps AFTN circuit with X.25 protocol was implemented using a router provided at Pago Pago, American Samoa;
- Singapore/Tokyo AFTN circuit was upgraded from 1200 bps to 9600 bps using X.25 protocol on 15 January 2003;
- Colombo/Mumbai AFTN circuit was upgraded from 50 baud to 64 Kbps using X.25 on 19 March 2003;
- A 64 Kbps circuit was implemented in April 2003 to upgrade AFS circuits between Chennai/Kuala Lumpur;
- Kolkata/Mumbai AFTN circuit was upgraded from 9600 bps to 64 Kbps in March 2003;
- Colombo/Singapore AFTN circuit was upgraded from 75 Baud to 9600 bps using X.25 protocol on 12 May 2003;
- Christchurch - USA 9600 bps AFTN circuit using X.25 protocol is under testing and expected to be implemented in July 2003;
- Christchurch/Tongatapu AFTN circuit was implemented using 2400 bps; and
- Routing of AFTN messages between Kolkata and Dhaka was established via Mumbai and Bangkok. The AFTN message transit time requirements for those messages relayed via the alternate route were satisfied.

Inter-regional AFTN entry/exit point

3.27 Australia informed the meeting that a new 64 Kbps AFTN circuit between Brisbane to Johannesburg is being established in 2-3 months time to replace the Brisbane/Mauritius 50 Baud AFTN circuit in accordance with the Conclusion 13/9 of the Thirteenth African Planning and Implementation Regional Group (APIRG/13) Meeting which had proposed to change the AFI ASIA/PAC entry/exit point from Mauritius to Johannesburg.

3.28 It was also advised that the 2400 bps COP-B circuit between Brisbane and Singapore was converted to X.25 protocol on 13 November 2002. In order to provide diversity between two centres in Australia, capability has been provided at Melbourne to operate Melbourne/Singapore AFTN using IPL. A need to rationalize three circuits linking to USA from Brisbane, Nadi and Christchurch was identified.

3.29 It was noted that Japan had made a proposal to the Russian Federation to upgrade the Tokyo/Moscow circuit from 200 baud to 9600 bps through a 64 Kbps satellite circuit. Japan is expecting response from the Russian Federation concerning their readiness to upgrade the circuit.

Study of alternative communication protocol to X.25

3.30 The meeting was advised that the European AFSG was informed of a proposal for amendment to the ASIA/PAC Regional Air Navigation Plan that specified the requirements for inter-regional gateways in the United Kingdom, Italy and the Russian Federation, which need to be met by 2005. In the case of the Russian Federation this involved the BBIS (X.25) routers of Japan (64 Kbit/sec) and China (19.2 Kbit/sec). The response of the Russian Federation to the proposal was to propose to change the specified parameters and date to TBD, in order to have time to develop a more coherent approach, based on agreed and common principles. The European Group agreed with this approach and requested ICAO as a first step, to coordinate the use of X.25 in the ASIA/PAC Region, in particular with respect to the X.25 developments and the operational requirements that had to be accommodated.

3.31 The meeting noted that the concerns expressed by the Russian Federation, and that the ad hoc Working Group would be tasked to investigate the impact of X.25 capability within the region to determine availability and need for X.25 subnet technology and to wait on the development on TCP/IP from the ACP Working Group.

3.32 It was agreed that this issue will be studied further by the Task Force to identify alternate communication protocol with understanding the difference of using X.25 communication protocol in this ASIA/PAC region for support to AFS are mainly for end to end connection communication control over IPLC. The need to identify an alternate communication protocol to X.25 was also raised at the COM Co-ordination meeting held in Dhaka in May 2003. In view of the foregoing, the ATN Transition Task Force in its Decision 5/7 assigned the task to study the issue by its ad-hoc Working Group and present the result at the Sixth Meeting of the Task Force in 2004.

3.33 The meeting noted the need to continue to support the existing AFTN application including AIDC services during the transition from AFTN to AMHS and perceived that there would be no changes to the message format for those carried over by AMHS.

Review report of AIDC Review Task Force

3.34 The AIDC Review Task Force (AIDC/R TF) meeting, hosted by Airservices Australia, was held in Brisbane from 27 to 28 March 2003. The meeting was attended by thirty five experts from Australia, China, Hong Kong China, Fiji, India, Japan, New Zealand, Pakistan, Singapore, Thailand, United States, IFALPA and SITA.

3.35 The meeting noted that the Task Force reviewed the existing ICD for AIDC and the experience gained and lessons learned in the implementation of the AIDC by States and developed a Draft Version 2.0 of the ASIA/PAC ICD for AIDC.

3.36 This Version 2 of the ICD for AIDC was brought to the attention of the ATS/AIS/SAR/SG/13 meeting which endorsed the Conclusion formulated by the Task Force for submission to APANPIRG/14.

AFS Communication Improvements in India

3.37 India provided status of implementation and the progress made in upgrading AFTN circuits. The Mumbai/Bangkok and Mumbai/Colombo AFTN circuits were upgraded to 64 kbps. Chennai/Kuala Lumpur AFTN and ATS direct speech circuits were upgraded using 64 kbps link. Actions have been taken to upgrade the AFTN and ATS direct speech circuits between India and Pakistan and India and Bangladesh using 64 kbps links. Coordination is underway for upgrading the Mumbai/Nairobi AFTN circuit to 64 kbps.

3.38 The Mumbai-Kolkata, Mumbai-Delhi, Mumbai-Chennai, Chennai-Kolkata, Delhi-Kolkata, AFS circuits were upgraded to 9.6 Kbps data circuit by using 64 Kbps link for both voice and data.

3.39 IDD hotlines have been provided between Kolkata/Dhaka and Guwahati/Dhaka in December 2002 and January 2003 respectively which were working one way from India. In May 2003, CAA Bangladesh has implemented these hotlines from their side also and these hotlines are operating both-ways now. IDD hotline between Agartala-Dhaka has been commissioned in June 2003. IDD hotline between Chennai-Medan (Indonesia) has been provided in December 2002 on implementation of EMARSSH route structure.

3.40 IDD hotline between Varanasi/Kathmandu for ATS coordination has been provided since October 1999. the status of this circuit needs to be reflected in Table CNS-1E.

3.41 The meeting noted the above status and appreciated the efforts made by the Administrations concerned in upgrading the circuits to comply with the requirements specified in the AFTN Plan.

AFTN services in the Pacific

3.42 The meeting noted that Airways New Zealand had installed new AFTN terminals in Tonga and Samoa and upgraded the AFTN terminal in Rarotonga. All the circuits are operating with the signaling speed of 2400 bps. The implementation of the AFTN user terminals at Tonga, Samoa and Rarotonga has improved the efficiency of flight planning and provides access to a common database.

3.43 The implementation of a direct AFTN circuit between Christchurch and the United States is nearing completion and is expected to be implemented by the end of July 2003.

AFTN/AIS database upgrade in New Zealand

3.44 Airways New Zealand embarked on a major upgrade programme to replace its aging Aeronautical Fixed Telecommunications Network (AFTN) systems. The AFTN replacement project, known as AMSAD (Aeronautical Message Switch / Aeronautical Database), not only provides current AFTN and Database functionality but has the ability to keep pace with the latest developments in AFTN and ATS message handling systems (AMHS). It provides an up-to-date windows interface through Airways' SkyLine ATM workstations and an enhanced environment in the NOTAM office.

3.45 AMSAD goes hand in hand with the new SkyLine ATM to provide Airways with modern air traffic systems for the new decade. The AMS was commissioned in June 2002 and ran in parallel with the old system. Circuits were progressively moved from old to new message switches allowing for a staged transition of users.

3.46 The AIS Database system, after successful factory and site testing, was commissioned in November 2002 with the transfer of existing NOTAM and MET databases to the new system. The upgraded AFTN/AIS system provides a totally integrated ICAO-compliant system with the ability to expand to the proposed ATN.

3.47 The system provides AFTN User Terminals (AUT) and ATIS systems for 17 domestic control towers and 3 Air Traffic Control Centres. International connections are through Brisbane, Nadi, Tahiti and Oakland. Tonga, Samoa and Rarotonga are also serviced with AUTs. VOLMET and FISB (Flight Information Service Broadcast) are also provided in Auckland.

3.48 NOTAM Office functions are provided by AIS terminals connected to the ANAIS database via TCP/IP. ATN connectivity will be provided by an AMHS Gateway connected to the AFTN switch.

Alternate routing proposal for ATS direct speech circuits between USA/Fiji and USA/New Zealand

3.49 The United States presented a proposal for establishment of a reliable ATC voice communications with alternate routing capability which is critical for safety, airspace efficiency, and the timely coordination of aircraft operations. USA/Fiji and USA/New Zealand ATC voice communications have been established. The new USA/Fiji ATC compressed voice service transitioned to operational service in October 2002. The USA/New Zealand ATC compressed voice service became operational in March 2003. Both of these voice services are compressed to 8 kbps. The Promina equipment uses an industry standard, the Conjugate Structure Algebraic Code Excited Linear Prediction, CS-ACELP (G.729), for voice compression.

3.50 Currently IDD backup are available for these voice services. The implementation of an alternate routing capability between the USA, Fiji, and New Zealand would improve the current configuration by increasing service reliability. Alternate routing would provide another layer of diversity for critical ATC voice services in the event of an outage on the primary leased communication link.

3.51 Since similar hardware platforms exist and additional bandwidth is available on both the USA/Fiji and USA/New Zealand trunk circuits, enabling alternate routing for USA/Fiji/New Zealand ATC voice services could provide cost effective protection against trunk/channel failures.

3.52 Airports Fiji Limited and Airways Corporation of New Zealand, Limited were invited to consider the implementation of alternate routing for ATC voice services between the USA, Fiji, and New Zealand. It was expected that the administrations concern would review the proposal and take appropriate action.

3.53 Other states are invited to review this alternate routing proposal for potential applicability to their international ATC voice communication services

Result of COM co-ordination meeting

3.54 The meeting was informed that a COM Co-ordination Meeting was held in Dhaka, Bangladesh from 27-29 May 2003. The objectives of the meeting were to review status of implementation of the required AFTN/ATS direct speech circuits and to develop a coordinated action plan to implement and upgrade AFTN and ATS direct speech circuits.

3.55 The meeting noted that AFTN diversion routing between Dhaka and Kolkata was coordinated by ICAO regional office in accordance with an action plan agreed at the previous COM coordination meeting held in Kunming in June 2002. Subsequently, the routing changes were implemented by States concerned. As an interim arrangement current AFTN routing for traffic between Bangladesh and India has been established via Bangkok and Mumbai, which meets the specified transit time requirement. However, a direct AFTN circuit between Dhaka and Kolkata is still required to provide an alternate routing for AFTN traffic to/from Bangladesh.

3.56 Considering difficulties for the use of the recommended VSAT technology for the time being because of regulatory restriction at Indian side, both Bangladesh and India agreed to establish a 64 Kbps data circuit via International Private Leased Circuit (IPLC) to support a 9600 bps AFTN circuit and an ATS direct speech circuit. The service providers-Videsh Sanchar Nigam Limited (VSNL) of India and Bangladesh Telephone and Telegraph Board (BTTB) have been consulted. Special approval is required for sharing the IPLC with voice communication at Bangladesh side. Bangladesh was requested to take urgent action for the approval for use voice over the IPLC. Action plans for establishing the circuits was developed by the meeting. The meeting was informed that both India and Bangladesh have already taken necessary action to establish the 64 kbps circuit. The ATS voice circuit will be established subject to special consideration and approval by BTTB as an exception as the voice communication is not permitted by BTTB at this time on the 64 kbps leased channel. It is expected that the circuit will be implemented by the end of November 2003.

3.57 Sri Lanka informed the meeting its readiness for upgrading the Colombo/Male AFTN circuit. It was informed that Maldives had included the AFTN upgrade in the Airport Upgrading project; phase IV which would start from July 2003. It is expected that upgrading of AFTN circuits will be completed by the end of 2003.

International Direct Dialling (IDD) hotline for direct speech circuits

3.58 It was also noted that IDD hotlines are used by States to support the ATS direct speech circuits. It generally meets the requirement for 15 seconds access time and low-density traffic. Such IDD circuits should be upgraded to dedicated circuits or AIDC should be introduced when requirement warrants.

Use of VSAT to support AFS communications

3.59 The meeting expressed the view that the States concerned should give serious consideration for the use of VSAT as a cost effective solution to establish and upgrade AFS circuits and also to provide link to RCAG VHF sites. States were urged to take necessary action to overcome regulatory restriction for the use of VSAT between States to support aeronautical circuits.

3.60 IATA informed the meeting that technical assistance was provided to Afghanistan and its neighbouring countries to establish VSAT link to implement required AFTN and ATS direct speech circuits as a cost effective means and encouraged States to overcome regulatory restrictions and other constraints and implement VSAT to support AFS circuits, where required.

Agenda Item 4: Aeronautical Mobile Service
1) review agenda item 7 of AN-Conf/11
2) review operation of CPDLC

4.1 Under this Agenda Item, the meeting reviewed the result of discussions on relevant issues derived from the Regional Preparatory Meeting for the Eleventh Air Navigation Conference (AN-Conf/11) which was held in Bangkok, Thailand from 27 to 28 January 2003. The Preparatory Meeting was conducted in accordance with a recommendation made by the 39th DGCA Conference. The meeting also reviewed the Agenda Item 7 of Eleventh Air Navigation Conference (AN-Conf/ 11) to be held from 22 September to 3 October 2003 at ICAO Headquarters, Montreal, Canada. The evolution of existing systems and potential development of future systems will be considered by the Conference.

4.1.1 It was noted that availability of adequate spectrum for different communication systems was becoming a critical aspect of air navigation planning.

4.1.2 The outstanding issues identified were the need for integration of multiple data links for simultaneous operation and provision to ensure priority access and pre-emption over non - aeronautical users in the 1.5/1.6 GHz satellite communication band i.e. AMS[R]S spectrum.

4.1.3 It was also noted that satisfactory operation of data links including Flight Information Services (DFIS) applications such as D-VOLMET, D-ATIS and PDC would significantly decrease the need for air-ground voice communication. It was also noted that the benefits gained from using CPDLC and ADS for more than 7 years over ACARS especially for reducing HF voice communication.

AMS requirement considered for AN-Conf/11

4.2 Australia informed the meeting of a programme to upgrade VHF Air/Ground infrastructure including strategic decisions on the selection and performance requirements of the new system. In particular, the VHF System Upgrade Project is intended to remedy the emerging deficiencies with the current system, addressing obsolescence, improving performance, and exploiting the capabilities of contemporary technology to improve the efficiency and effectiveness of VHF communication service delivery.

4.2.1 The meeting observed that satellite services, other than aeronautical mobile satellite services are not acceptable for aviation safety of life services. The meeting also noted that many ATS services were not configured to deal with satellite voice services.

4.3 The meeting agreed that the following issues would serve as guidelines for States in the preparation of AN-Conf/11 from the ASIA/PAC perspective while dealing with these subjects at the Conference.

- 1) a channel spacing of 25 kHz will continue to be the operational specification in ASIA/PAC Region as it is expected to satisfy requirement for the foreseeable futures;
- 2) the VHF voice service, backed by CPDLC and HF will be the primary communication medium for transcontinental traffic; and a combination of CPDLC and HF voice will be the communication medium for oceanic traffic; and

- 3) the requirements for basic voice communications will continue, supplemented by data link Flight Information Services (DFIS) applications including D-VOLMET, D-ATIS and PDC, which would significantly release the pressure of VHF spectrum congestion

Data Link Flight Information Services (DFIS)

4.4 Hong Kong, China informed the meeting of their successful trials on Data link – automatic terminal information services (D-ATIS), Data link –VOLMET (D-VOLMET) and Pre-Departure Clearance (PDC). It was informed that positive feedback had received from pilots, IATA, airlines and controllers. The systems have been closely established and confirmed that they can offer added operational and/or safety benefits including:

- Reduction in workload for pilots and controllers;
- Greater data integrity;
- No time constraint and no coverage limitation for pilots to obtain the ATIS/VOLMET information;
- Reduction in radio channel congestions for PDC delivery;
- Enhanced flight efficiency and safety;
- Receiving at will by the pilot;
- Most updated information; and
- Quick access to specific information in the VOLMET/ATIS/PDC messages

4.4.1 The D-ATIS and D-VOLMET systems have been commissioned for operational use since April and December 2001. More than 35 airlines are now using the services, with the peak monthly requests now reaching 8,400 approximately. For the PDC delivery via data-link, more airlines are now utilizing the services, representing about 43% of the departure traffic at the Hong Kong International Airport. Several airlines have expressed interest to participate and would use the above data-link service.

4.4.2 Samples of D-VOLMET, D-ATIS and PDC Print out in the Cockpit also presented to the meeting.

4.5 Republic of Korea informed the meeting that as part of the new CNS/ATM system implementation plan at Gimpo International Airport, the pre-departure clearance (PDC) and Data link-ATIS (D-ATIS) systems, which were developed using domestic technology, have been in service since December 2001. The data link for the PDC system at Gimpo International Airport was introduced in 1998, and the D-ATIS system in 1999. The number of aircraft serving domestic routes with ACARS has been increasing since 2002 and the frequency of requests for the PDC/D-ATIS using data link has been rising as more users have begun to acknowledge the convenience of the systems. A new communication server for such systems will be located at Gimpo International Airport and terminals will be installed at other airports. The flight plans provided by Incheon ACC with the real-time PDC and ATIS data obtained from each of the linked airports will be stored in the communications server. Upon receiving a PDC or D-ATIS request from an aircraft, the requested data will be provided using the Aircom service.

Satellite Voice Communication

4.6 Australia presented a paper regarding ICAO policy in relation to the use of satellite voice communications. It was noted that the current ICAO Policy, as expressed in the *Global Air Navigation Plan for CNS/ATM Systems* (ICAO Doc 9750, Sect. 5.5-5.6) is that, once digital data interchange (data link) becomes generally available, data should be favored over voice for routine communications. AMSS voice services described in Annex 10 Volumes 2 and 3 provide for different

levels of services based on the criteria of ATS, AOC, AAC and APC. Alternative public access satellite voice communications services are now readily available and affordable. Applications of the service are airline administrative and passenger communications. Requests are now being received for the use of these public access satellite system for higher priority applications. It was considered that there is a lack of guidance on the use of satellite voice, both aeronautical and public access satellite and how it combines with HF voice with and without data-link capability. It called for States and regional groups to freeze any non-emergency or trial use of current satellite voice technology outside "data-link environment and proposed to develop a globally coherent policy and operating procedure for the use of SATCOM voice. This issue was considered to be one of the items to be raised at the AN Conf/11.

4.6.1 IFALPA advised the meeting that SATCOM voice and data are minimum requirements for the use of the ATS route L888 in the Western part of China.

4.6.2 SITA advised the meeting that common system elements were used in delivery of satellite voice service as that of satellite data. Typical FANS SATCOM avionics accommodate dedicated channels for data and voice over satellite.

4.6.3 It was noted that SATCOM voice is available for airline operational control communication and public communications and is also used for emergency communication. Secretariat informed the meeting that the SATCOM voice currently provided on board aircraft do not satisfy technical specification of Annex 10. Therefore, implementation and its performance have not been reviewed in terms of provisions of ATS.

4.6.4 In view of the foregoing, it was agreed that States use SATCOM voice service in compliance with the existing SARPs and that ICAO review the relevant Technical Work Programme (ANC Task No. CNS-9902) in respect to SATCOM to provide global policy for use of SATCOM voice and formulated the following Draft Conclusion:

Draft Conclusion 7-10/6 - Use of SATCOM voice for ATS

That,

- a) SATCOM voice be used in compliance with existing SARPs; and
- b) ICAO develop a global policy for the use of SATCOM voice for ATS function.

AMS Network Management

4.7 The meeting recognized that SARPs exist for aeronautical mobile service that relate to system standardization and interoperability. SARPs typically define signal in space characteristics to ensure end system compatibility. Current AMSS SARP does not cover management protocol across satellite providers' boundaries, which pertains to management of satellite channels and spectrum, aircraft link establishment and handover rules and responsibilities between such satellite providers. These network management issues have been addressed by the satellite service providers.

4.7.1 The current AMSS SARPs cover data transactions and do not define satellite voice. There is a need to address SARPs for satellite voice services and also to address network management arrangements between service providers.

4.7.2 VDL SARPs recognize intra network and system management. However inter networking is essential to ensure efficiencies related to frequency management and channel throughput. Network management arrangements must also be pursued by service providers taking into account appropriate spectrum use as detailed by ITU to ensure service protection and recognition.

HF Communication

4.8 Republic of Korea informed the meeting of the need for an aeronautical station at Seoul to provide HF air-ground communication service for aircraft operating in the area out of VHF coverage in the North Central Asia-3 (NCA-3) region. The number of aircraft flying from Republic of Korea to Russia, Mongolia, DPRK, and European countries via NCA-3 network has steadily increased since the early 1990s. There were 190 such flights during a week in the December 2002. The airlines flying in the area have requested the Republic of Korea to provide HF aeronautical mobile communication service in NCA-3 network area. It was noted that provision of aeronautical mobile communication service in MWARA NCA-3 by Seoul radio would contribute to the safety and efficiency of aircraft operating in the region. The meeting agreed to the proposal made by the Republic of Korea to join the Major World Air Route Area (MWARA) NCA-3 network and provide aeronautical mobile service from the end of 2003 using 3004 kHz and 13303kHz frequencies which are already allotted to NCA-3 network stations. Accordingly, the meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/7 - Inclusion of Seoul in MWARA NCA-3

That, the ASIA/PAC FASID be amended to specify requirement for an aeronautical station in Seoul to provide HF air-ground communication in the MWARA NCA-3 Network.

4.9 Australia informed the meeting of the their initiatives to rationalise and modernise HF voice services for international and domestic services by replacing the current International and Domestic high frequency communications systems. The antennas utilized are capable of connecting high and low angle signals to separate receivers, where they can then be individually analysed to determine signal quality. The system achieves the benefits of path diversity by then comparing the Signal to Noise Ratios (SNR) of both versions of the same signal (a process known as voting) and passing only the best to Brisbane in compressed form via digital terrestrial bearers. In Brisbane this signal will then be voted against the best signal from each other site that has received the same call, with only the best overall signal then presented to the operator.

4.10 The following status on improvement and enhancement of VHF coverage in Indian airspace was noted:

Enhancement of VHF coverage over Indian airspace in the Oceanic and Landmass regions

- To enhance the ACC coverage of Mumbai and Trivandrum airport over Arabian Sea, RCAG/VSAT at Agatti (An island in Arabian Sea) controlled from Mumbai and Trivandrum airport and RCAG at Porbandar controlled from Mumbai airport were installed and commenced operation in Oct. 2001;
- RCAG VHF Station at Vishakapatnam and Port Blair controlled by both Chennai and Kolkata to enhance the VHF coverage of ACC Chennai and Kolkata was established in October/November 2000;

- As an immediate measure, ACC coverage of Delhi is being enhanced by installing RCAG/VSAT at Khajuraho to be controlled from Delhi; and
- As a long term measure, AAI has planned to network all Indian airports including civil enclave using VSAT technology through Dedicated Satellite Communication Network (DSCN). Transponders in one of the INSAT Satellite will be used for this purpose.

VHF/HF Digital link

- India is in the process of replacing old VHF transmitters and receivers at major airports with new transmitters and receivers having capability of VDL Mode 2 upgradeable to VDL Mode 3 and 4. The installation is likely to be completed by end of Dec. 2003;
- The new VHF transmitter and receiver shall be used for air-ground communication primarily for voice communication in first instance and would be used for air-ground data communication; and
- The HF Transmitters having capability of data link are being provided in place of existing HF transmitters and receivers used for MWARA at Delhi /Mumbai/ Kolkata/Chennai and Trivandrum airports. The installation expected to be completed by end of Dec. 2003. HF data link shall be used as and when airline operators are ready with the compatible avionics.

ADS/CPDLC

- ADS/CPDLC at Kolkata and Chennai airports using air-ground link through SITA network is in operation for FANS-1/A users. Target date for implementation of ADS/CPDLC at Delhi and Mumbai airport by integration with flight data processing system (FDPS)/ Radar data processing system (RDPS) automation system is end of 2004. The air-ground linkage for this application shall be provided through a data link service provider.

4.11 The meeting was informed that a seminar on implementation of data link and SATCOM communication will be held in Bangkok from 17 to 19 November 2003 in conjunction with Aeronautical Communication Panel (ACP) Working Group M meeting scheduled for 20 to 28 November 2003.

Agenda Item 5: Radio Navigation Aids

- 1) review strategies for Precision Approach and Landing Guidance Systems and GNSS Implementation;**
- 2) review agenda items 6 of AN-Conf/11**

Regional Strategies

5.1 The meeting was informed that APANPIRG /13 reviewed both strategies in light of available information presented to the meeting. APANPIRG/13 agreed to the changes proposed to the Strategy for the Provision of Precision Approach and Landing Guidance System. With regard to the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region, the APANPIRG/13 discussed the need to retain RNP-4 in paragraph b) of the Strategy for en-route and specify RNP 1.0 for terminal phase of flight. Since the Strategy was developed by an experts group, it was agreed, after a considerable discussion, to refer it back to the CNS/MET Sub-Group for comments. The Strategy with the amendments proposed by the CNS/MET Sub-Group was adopted without any change in considering the strategy for the implementation of GNSS.

5.2 Both strategies are considered living documents and the meeting undertook a review of both strategies noting the comments of APANPIRG/13, current state of development and application of GNSS and other technology and also the upcoming 11th Air Navigation Conference.

5.3 The review of the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC was updated to include an operation requirement of RNP 10 and 4 for enroute navigation and RNP 1 in the terminal area. System availability dates for Category I (2006) and Category II/III (2010 -2015) were noted in the considerations.

5.4 For the Strategy for the Provision of Precision Approach and Landing Guidance System an additional item was included to ensure the protection of radio spectrum for ILS, MLS and GNSS applications.

5.5 The meeting in proposing revisions to both strategies formulated the following Draft Conclusion:

Draft Conclusion 7-10/8 – Updated Revision of the Strategy for Precision Approach and Landing Guidance Systems and the Strategy for the Implementation of GNSS Navigation Capability in the ASIA/PAC region

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

Space Based Augmentation Systems

5.6 Japan informed the meeting on the current status of the MSAS and supporting MTSAT. MTSAT was scheduled for launch in mid 2003 however a problem with a meteorological mission resulted in the launch being rescheduled for early 2004. It will take several months for the testing of the satellite and it is expected that the AMSS will be operational in the Japanese fiscal year

2004 and the MSAS to be operational in the Japanese fiscal year of 2005. It is necessary for the MSAS to be strictly tested and certified before the commissioning.

5.7 The United States provided a status report on the Wide Area Augmentation System (WAAS). The most significant point was the commissioning of WAAS on 10 July 2003 for use in all phases of air navigation in the United States' NAS. After an extensive testing and assessment programme WAAS performance consistently demonstrates 1 m horizontal and 1.5 m vertical accuracy. WAAS IOC provides users with the capability to fly approaches with vertical guidance. This initial WAAS capability also provides improved guidance to users in the en route and departure domains. At commissioning, over 500 LNAV/VNAV procedures will have been published, which can be flown by WAAS capable aircraft. LNAV/VNAV is an approach procedure with vertical guidance with nominal minimums of a 350' decision height, 1½-mile visibility, 556m horizontal alert limit (HAL), and 50m vertical alert limit (VAL). The WAAS service area is the continental United States and portions of Alaska.

5.8 A post IOC implementation strategy will see an optimization of terminal approach procedures (TERPS) and investment in GEO satellite services to ensure that WAAS IOC and FOC are supported with redundant services.

5.9 The United States informed the meeting of commercially available TSO-145/146 receivers for WAAS.

11th Air Navigation Conference – Aeronautical Navigation Issues

5.10 The attention of the meeting was drawn to Agenda Item 6 of the 11 AN Conf programme. The Agenda Item is:

- 6.1 Global navigation satellite system (GNSS) development status based on reports from States, service providers and industry organizations;
- 6.2 Navigation policy issues in the light of present and envisaged GNSS services and architectures, integration and back-up options;
- 6.3 Amendments on aeronautical navigation subjects in relevant ICAO documents including the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750), Annex 10 -*Aeronautical Telecommunications* and other documents as necessary; and
- 6.4 Directions for future development of aeronautical navigation services.

5.11 The meeting also considered the report of the Regional Preparatory meeting as it applied to this agenda item.

5.12 The meeting observed that harmonised implementation of navigation system is desirable. The strategies for Precision Approach and Landing and for GNSS Implementation represent the regional position for the implementation of navigation services. It is important that implementation plans are suited to the Region's environment and maintain harmonisation with other regions.

Agenda Item 6: Surveillance

- 1) review report of ADS-B study and Implementation Task Force**
- 2) review surveillance systems**

Review report of ADS-B study and Implementation Task Force

6.1 The ADS-B Study and Implementation Task Force, hosted by Airservices Australia, was held in Brisbane from 24 to 26 March 2003. The meeting was attended by fifty-three experts from Australia, China, Hong Kong China, Fiji, India, Japan, New Zealand, Pakistan, Singapore, Thailand, United States, IATA, IFALPA and SITA. The meeting was also attended by representatives from Industries including Airbus, Boeing, Thales ATM, Honeywell and Sensis.

6.2 The meeting noted that the Task Force reviewed the ADS-B related activities conducted by States, Industries and ICAO Panels. The meeting also noted the excellent progress made by the Task Force in establishing direction for the implementation of ASB-B in the Region.

6.3 It was also noted that the implementation of “ADS-B out” for ground-based surveillance services in ASIA/PAC Region would commence in January 2006.

6.4 The Task Force proposed new Terms of Reference for the ADS-B Study and Implementation Task Force to develop an implementation plan for near term ADS-B application in ASIA/PAC region including target dates, taking into account available equipment standards and readiness of airspace users and ATS providers. In view of this the meeting endorsed Draft Decision as follows:

Draft Decision 7-10/9 - Revision of the Terms of Reference of ADS-B Study and Implementation Task Force

That, the new Terms of Reference of the ADS-B Study and Implementation Task Force be adopted as shown in Appendix I.

6.5 It was noted by the meeting that the Draft Conclusions 1/2 and 1/4 of the Task Force were supported by the ATS/AIS/SAR/SG/13 and included in their report for adoption by APANPIRG/14.

6.6 It was noted that the ADS-B Task Force unanimously recommended that Mode S Extended Squitter (1090 ES) should be used as the data link for ADS-B radar like services in the ASIA/PAC region for air transport category aircraft in the near term.

6.7 The meeting discussed the intent of Draft Conclusion 1/3 and considered alternative wording to include high performance and high altitude aircraft within the capture of the conclusion. The Task Force described the datalink selection of Mode-S ES 1090 as near term and in the future additional datalinks may be specified as necessary. Taking this into account the meeting proposed a revised Draft Conclusion as follows:

Draft Conclusion 7-10/10 - Near term ADS-B datalink selection

That, Mode S Extended Squitter (1090 ES) be used as the data link for ADS-B radar like services in the ASIA/PAC region in the near term.

ADS-B Trials

6.8 Australia informed the meeting of progress with the Operational Trial of ADS-B. The project has installed a single ADS-B ground station and equipped a number of aircraft with ADS-B avionics and has modified an operational air traffic management system to process and display ADS-B tracks. A safety case has been submitted to the Australian regulator and it is expected that the system will be used operationally using 5NM radar like separation standards. The performance of the system has exceeded expectations. The meeting was shown examples of coverage of low level helicopter operations, track comparisons between SSR radar and more dynamic ADS-B data and opportunity observation of a international freight aircraft.

6.9 The meeting was also informed by Australia of progress by the Separation and Airspace Safety Panel (SASP) on the use of 5NM radar separation standards for ADS-B. It is anticipated that the necessary amendments to PANS-ATM Doc 4444 will be finalised late 2004 with final publication in late 2005. It was also identified that the European implementation of Elementary and Enhance surveillance and United States changes to transponders for security purposes provide an opportunity to minimise the cost of ADS-B out equipage.

Update of ADS-B Activities in Mongolia

6.10 Mongolia informed the meeting of their activities regarding the implementation of ADS-B for both domestic and international airspace. Demonstrations and modelling have demonstrated the capability of ADS-B as well as capabilities achievable by combinations of ADS-C, ADS-B and radar. Continued validation and information gathering is being pursued through investment in two CNS/VDL Mode 4 ground stations and five airborne units that include cockpit display of traffic information (CDTI). The equipment will be installed on board domestic flying MIAT AN 24's and the ground stations will be placed in Ulaan Baataar and Muren. Both ground stations will be connected to the Ulaan Baataar ATC Center.

6.10.1 The domestic traffic throughout the domestic network of airports has a need for surveillance coverage to ease constraints between aircraft. Another useful tool for the introduction of ADS-B is enhancement of the national search and rescue (SAR) capability.

6.10.2 Taking into consideration that the agreed recommendation for ADS-B data link for the ASIA/PAC Region will be Mode S (1090 ES), Mongolia advised the meeting that VDL Mode 4 data link equipment will only be used for domestic airline operations and it is planned to install additional ADS-B Mode S (1090 ES) equipment for use by international airlines.

Update of ADS-B Activities in USA

6.11 USA updated the ADS-B related information. The FAA ADS-B link decision was made in July 2002 and approved two data links. The 1090 MHz extended squitter ADS-B data link is to be used by air carrier and private/commercial operators operating in the higher altitudes, while a universal access transceiver (UAT) ADS-B link will be used by the typical, general aviation users. In 2003, the Alaska Capstone programme conducted the first commercial flight using an "optimized" RNAV Special FAR 97 route structure in conjunction with enhanced Capstone Phase 2 avionics that includes a GPS/WAAS receiver certified under TSO 145a, in airspace inaccessible with conventional avionics. The United States remarked that ADS-B was currently the most significant advancement for aviation. IATA supported this remark.

6.12 The meeting was informed that the U.S. FAA will continue to use operational ADS-B in the separation of aircraft within the State of Alaska.

24 Bit Aircraft Addresses

6.13 Japan presented a paper on the analytical results of the unauthorized aircraft addresses in 2002 by Aircraft Address Monitoring System (AAMS) installed at New Tokyo and Kansai international airports. The paper follows on from a previous paper presented at the CNS/MET SG/6 Meeting and was prepared at the request of the CNS/MET SG. A downward trend in the number of unauthorised addresses was noted in the paper over the three year span of analysis. It was noted that detected unauthorised addresses are follow-up with the operator and that the AAMS only detects aircraft within the vicinity of either New Tokyo or Kansai international airports. The downward trend may be as a result of action Japan and may not be the situation for other part of the region.

6.14 Discussion highlighted a safety issues of addresses set to all zeros. These addresses are ignored by ACAS systems and therefore nullify the projection offered by ACAS.

6.15 The meeting also noted by that ICAO had written to States to highlight the concern with appropriate allocation, management and implementation of aircraft addresses. The mater was also raised at the 39th DGCA Conference.

6.16 The meeting asked Japan and Australia prepare a proposal to improve the management of aircraft address codes. The proposal prepared recommended that the Regional Office write to States referring to previous correspondence, advising States of continuing illegal or incorrect addresses being used by aircraft, emphasising that this can be a safety issue and to request States to advise airlines of this continuing problem and seek their in assistance in overcoming it. Australia offered to seek advice from the SCRS Panel on:

- a) Plans or procedures for the allocation of 24 bit addresses to airport vehicles;
- b) Plan or procedures for the allocations and management of 24 bit addresses to leased aircraft; and
- c) Whether or not consideration has been given in SARPS or Guidance Material requirements for periodic checks (ramp testing) for 24 bit addresses.

Carriage of Pressure-Altitude Reporting Transponders

6.17 Annex 6 requires that from 1 January 2003 all aircraft shall be equipped with a pressure-altitude reporting transponder. The requirement was generated to ensure that aircraft fitted with ACAS were operated in an airspace environment where all traffic would be visible to that equipment, or, by the use of airspace restrictions, be segregated to operations in transponder mandated airspace. Many States have either not responded to the Annex 6 requirement or have filed a difference (i.e. not complied) with the A/C transponder carriage provisions. In addition they have not re-classified their airspace to ensure compliance.

6.18 The meeting was advised that, for aircraft that are operating continuously outside of radar coverage, the high cost of transponders for general aviation operators had inhibited compliance. This may affect the original safety objective of the Annex requirement and it was therefore suggested that it may be appropriate to conduct a review of this requirement to ensure the original safety objective is being achieved.

6.19 IATA spoke of the fundamental safety requirement for the carriage of pressure altitude report transponders and requested that non-implementation of the Standard be recorded as a deficiency.

Agenda Item 7: Aeronautical electromagnetic spectrum utilization:
1) review agenda item 5 of AN-Conf/11

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

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

7.3 During the preparation for the WRC-03, ICAO played an active role in the activities of the regional telecommunication organizations “the Asia – Pacific Telecommunity (APT)” and Study Group 8 of the Radiocommunication Bureau of the ITU. ICAO also organized two Regional Preparatory Meetings to review and address developments by States and regional telecommunication organizations.

7.4 Designation of focal point of contact responsible for preparation for WRC-2003 was a very important factor in facilitating coordination with Telecommunication Regulators in each State to coordinate aviation position. Necessary support provided by observers from IATA, IFALPA and APEC also contributed to the success.

7.5 States are expected to study spectrum allocations to all aeronautical services in light of the outcome of WRC-2003 and present proposals at the AN-Conf/11 if further actions are required to ensure availability of adequate spectrum to support the ATM operational concept.

Outcome of WRC-2003 affecting Australian aviation

7.6 Australia presented a comprehensive review of the outcome of the WRC 2003. It was informed that the Australian ICAO designated contact for WRC-03 was a member of the Australian Delegation at the Conference. The agenda for the WRC-03 contained more than fifteen items, which will have an impact on aeronautical radionavigation and communication services to a greater or lesser degree. Subjects of particular importance include radionavigation satellite service/aeronautical radionavigation service (RNSS/ARNS) compatibility, future aeronautical utilization of the 5 GHz band in light of spectrum requirements for the microwave landing system (MLS), regulatory provisions permitting the operation of new ICAO standard systems supporting navigation and surveillance functions in the band 108-117.975 MHz and possible new requirements for ARNS and/or aeronautical mobile (R) services (AM(R)S).

7.7 It was stated that the continuing availability of spectrum for aeronautical communications and navigation would also be considered at AN-Conf/11.

7.8 AN-Conf/11 will also review the agenda of the ITU WRC-07 (approved at WRC-03) to identify any items of potential concern to aviation that would need to be addressed in preparation for the next ITU conference.

7.9 That the meeting noted that there are significant issues that have implications for aviation resulting from WRC-2003 such as:

- a) the use of the 14 GHz band for non-safety of life broadband satellite communication for aircraft passengers internet applications, HF interference mitigation techniques, protection of DME with the implementation of L5 GNSS, protection of radars with the evolution of L2 GNSS, protection of radars in the 2.9-3.1 GHz and 5 GHz bands, and spectrum allocations for GBAS/GRAS and VDL Mode 4; and
- b) co-primary allocations in the 9 GHz aeronautical radar band, spectrum requirements for wideband aeronautical telemetry, use of the 5 GHz aviation band for air-ground voice communication and runway incursion systems, and modernization of civil aviation telecommunication systems through current satellite allocations;

7.10 IATA stated that the need for spectrum in the 5 GHz band required for runway incursion and prevention will be one of the important issues to be considered by WRC-2007 in which IATA had been giving emphasis during the regional preparatory meetings for WRC-2003 as well as at WRC-2003.

7.11 In view of the foregoing the meeting formulated the following Draft Conclusion.

**Draft Conclusion 7-10/11 - Preparation for World Radio Communication
Conference 2007 (WRC-2007)**

That, States,

- a) assign high priority to aeronautical spectrum management;
- b) participate in the development of States' position for WRCs at the national level to ensure support to the ICAO position;
- c) ensure, to the extent possible that, aviation representatives are included in States delegations to the Asia-Pacific Telecommunity (APT) Conference Preparatory Group) meetings and at WRCs;
- d) to nominate an ICAO designated focal point or contact person for aviation issues related to the WRC-07; and
- e) ensure participation of the designated focal point or contact person at the ICAO Regional Preparatory Group Meetings for WRC-07, APT Conference Preparatory Group Meetings for WRC-07, and at WRC-2007.

- Agenda Item 8:** **Review:**
 1) **implementation of ISCS and SADIS**
 2) **transition to the final phase of WAFS**

Progress in implementation of the ISCS and SADIS

8.1 Under this agenda item the meeting reviewed the current status of implementation of the International Satellite Communication System (ISCS/2) provided by the United States of America and the Satellite Distribution System for information relating to air navigation (SADIS) provided by the United Kingdom as integral part of the ICAO aeronautical fixed service (AFS).

Current implementation status and update of FASID Table MET 7

8.2 The current status of implementation of SADIS and ISCS is reflected in FASID Table MET 7. The table content has been reviewed and updated, as necessary. The meeting was informed that the provisions related to SADIS and ISCS in the regional ANPs should be harmonized for all ICAO regions. In this regard, a new simplified format of FASID Table MET 7 has been proposed. The meeting agreed on the proposed new format of the table and formulated the following Draft Conclusion:

**Draft Conclusion 7-10/12 - Authorized users of the SADIS and ISCS/2
Satellite Broadcasts in ASIA/PAC Region –
FASID Table MET 7**

That, table MET 7 of ASIA/PAC FASID, Part VI – Meteorology, be amended
as indicated in Appendix J to this part of the report.

8.3 Regarding the procedure of updating the FASID Table MET 7, it was recalled that this table was included in the FASID for information purposes only, and kept up-to-date by the Regional Office concerned, based on the information received from States and the annual review done by the CNS/MET/SG meetings.

Follow-up of the SADISOPSG/8 meeting

8.4 The eighth meeting of SADISOPSG, was held at the ICAO Office, Bangkok, 7 to 10 July 2003. The meeting discussed important developments of the system, in particular, the development of the SADIS second generation (SADIS 2G) system, discontinuation of the first generation two-way system, and the development of the operational concept for the second generation SADIS two-way system. The meeting formulated two draft conclusions to the attention of the PIRGs served by SADIS, related to the future development of the SADIS. The CNS/MET/SG meeting reviewed the proposal by the SADISOPSG/8 meeting and formulated the following Draft Conclusions:

**Draft Conclusion 7-10/13 - Implementation of the SADIS second-generation
system (SADIS 2G)**

That, subject to the successful completion of the trials, the APANPIRG
endorses the implementation of the SADIS second-generation broadcast
(SADIS 2G).

**Draft Conclusion 7-10/14 – Discontinuation of the current first-generation
SADIS two-way VSAT programme**

That, the APANPIRG notes the plan to discontinue the current SADIS two-way VSAT programme as of 1 January 2004.

8.5 The meeting was informed by the SADIS Provider State that the SADIS second generation when put into operation shall be run in parallel with the first generation system for the next several years, which will provide sufficient time to the States to plan the transition to the second generation receivers.

SADIS Strategic Assessment Tables

8.6 The meeting reviewed the SADIS Strategic Assessment Tables with entries regarding the current and projected data volumes for the period 2003-2007 as given in Appendix K to the report. The meeting was informed that the figures provided under “current OPMET” (for year 2003) have been established by carrying out a manual examination of the bulletins promulgated on SADIS during one day in early March 2003. The automated process that was previously used was unavailable this year because the application that was required to construct the figures was not compatible with the new Met Office message switch – FROST. Figures obtained via the manual process for 2003 were lower than the figures produced automatically in 2002. It was further clarified that the lower figures could result from the exclusion of the bulletins containing information for the region, but compiled in another ICAO region. It was envisaged that a more stable methodology would be available following the introduction of the SADIS Gateway function that would compile these figures in the future.

8.7 Concern was expressed by some delegates that the figures presented might not take into account the daily variability of the OPMET traffic. It was proposed that, in order to obtain an additional estimate of the volume of the OPMET information generated by the ASIA/PAC States and sent to London for uplink, Singapore OPMET Data Bank, which serves as inter-regional OPMET gateway between ASIA/PAC and EUR regions, should carry out statistics on the outgoing OPMET traffic and present the results to the next CNS/MET SG meeting in 2004. The member from Singapore agreed that such statistics could be provided. Based on this discussion the meeting agreed on the proposed tables and formulated the following Draft Conclusion:

Draft Conclusion 7-10/15 – SADIS strategic assessment tables

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

SADIS developments

8.8 The delegate from the UK informed the meeting of the important recent developments of the SADIS, which were noted by the meeting, as follows:

- the Internet based SADIS ftp service has been provided as an operational backup service to an increasing number of users during the year. Approximately 50 accounts have been activated, including a number for authorized ISCS users;

- the dissemination of WAFC London BUFR encoded high level SIGWX data on PVC3 has continued throughout the year. This information was declared operational on the 4 June 2003. Medium level BUFR encoded SIGWX data will become available during 2004;
- the SADIS provider was nearing completion of a trial of the SADIS 2nd Generation (2G) system. The 2G System will use cost-effective 'off-the-shelf' technology using the TCP/IP protocol from end to end and the industry standard modulation;
- administration messages have been issued on a regular basis during the year and also been made available for viewing on the SADIS web site: <http://www.metoffice.com/SADIS/SADISmessages.html> ;
- action has been taken to establish a web based one-month archive facility for administrative messages; and
- an additional supplier of VSAT hardware equipment – Bradford University Remote Sensing (BURS) Ltd. - would commence business in the SADIS market shortly.

Implementation of the ISCS

8.9 A transition to a successor ISCS has been planned by the United States in connection with advances in computer and telecommunication technologies and also because the telecommunication provider's contract for the current ISCS would terminate in September 2003. The new ISCS system was contracted to the company MCI. The transition would require:

- a) Upgrade of the VSAT receivers currently in use due to the change from X.25 to TCP/IP protocol; and
- b) Replacement of the STAR4 workstations for processing and display of WAFS data received through ISCS.

8.10 United States provided detailed instructions regarding the transition plan to the new ISCS, to all ASIA/PAC States under the ISCS footprint through a letter sent via the ICAO Office, Bangkok, on 28 February 2003. States were informed of the schedule and necessary action to be undertaken in order to meet the target dates. The meeting was provided with a revised schedule for implementation of the new ISCS, as follows:

- the TCP/IP protocol will be introduced in mid September 2003; the X.25 protocol would be also available until 1st January 2004; and
- after 1st January 2004 only TCP/IP protocol will be supported; thus, for a workstation to receive data via ISCS, it must be capable of interfacing to TCP/IP.

8.11 The member from United States informed further that the ISCS transmission using TCP/IP protocol would no longer provide the data in the current 6 permanent virtual channels (PVCs), but in 9 "sockets." This would require a software module be installed in all workstations. Information on this module would be supplied by MCI company as part of the transition to the new ISCS for all States concerned. Information would also be made available to all known workstation

manufacturers and a link would be available on the www.nws.noaa.gov/iscs web page for the States concerned to download the software module.

8.12 United States informed the States concerned that, while the upgrading of the VSAT receiver, including the on-site installation of the necessary new components, will be taken up by the US, the replacement of the workstations will fall into the purview of each Contracting State. It should be emphasized that all ISCS user States should have their new ISCS workstations operational by 15th December 2003 in order to continue receiving the WAFS products and OPMET data via the new ISCS. The States were advised that it would be more efficient if the two upgrades required (first, from X.25 to TCP/IP, and second, to obtain visualization software for BUFR coded SIGWX products) were undertaken at one step, rather than separately.

8.13 As regards the upgrade of the VSAT receivers and the network interface for supporting TCP/IP, all ISCS user States will be visited by a MCI technician. The visits will be financed by the ISCS Provider State. The schedule of the visits to States would be published on the ISCS web site and in addition, the States will be contacted individually very soon to make the necessary preparations. The States should be aware that two weeks before the scheduled transition date of their site, they will be contacted by MCI and by the ISCS program office and at that time will be provided with the details regarding the transition. All that will be required is to provide the MCI technician with access to the VSAT and Memotec equipment at the site. There would be no other requirements or resources required from the State. It was explained that due to the very tight schedule, the States, who fail to provide the required access to the equipment on the scheduled transition time, would not be transitions to the successor ISCS system until all sites at other States have been completed and would be responsible for the additional costs for a second visit.

Action required by States to prepare on time for the transition to the coming changes in the ISCS and WAFS products

8.14 Concern was expressed that some States might not be ready for the transition to the new ISCS, by the planned implementation date. In this regard, the member from United States stated that the plans to replace the existing ISCS had been discussed during the last two years. A letter containing detailed explanations and the time schedule for the necessary changes was sent through ICAO and WMO to all States concerned on 28 February 2003 to facilitate States' planning and equipment/software procurement. However, the meeting was also given to understand that the implementation programme for the ISCS upgrade had been put on hold until June 2003 due to a contract dispute. The expert from United States added that this hold did not change the information provided to States in the letter of 28 February 2003.

Back-up options for the ISCS users

8.15 The meeting was informed of the possible interim solutions of acquiring WAFS data for those States who might not have a new or upgraded operational workstation at the time X.25 was no longer supported on ISCS. WAFS London was currently providing a free ftp service as a WAFS backup for all authorized SADIS and ISCS users. If this service is used, visualization software would be necessary. The UK Met Office can furnish a State with the name of a software company, which can provide cost effective visualization software. This software can be used to seamlessly (automatically) access WAFS T4 wind and temperature charts, and WAFS T4 significant weather (SIGWX) charts from the UK SADIS ftp back-up service. More information on this option could be obtained from Richard Orrell, Richard.orrell@metoffice.com.

8.16 The meeting felt that the ftp back-up service provided by the UK was the most suitable option for receiving WAFS products for those States that might not be ready with their new systems for receiving and processing WAFS data through the new ISCS, and formulated the following Conclusion:

Draft Conclusion 7-10/16 – Use of the SADIS Internet Back-up Service by ISCS User States

That, the ISCS user States be encouraged to consider the use of the SADIS internet-based back-up service as an interim solution for reception of WAFS products and OPMET data in the event of difficulties in meeting the ISCS transition schedule.

Note: The use of the SADIS internet-based back-up service would require a software for visualization of the WAFS products.

8.17 As a second unofficial back-up option, United States advised that all WAFS graphical products and links to OPMET data and the global gridded wind and temperature data are accessible at the web site: <http://aviationweather.gov> and then clicking on “flight Folder.” The meeting was advised that in the United States the Federal Aviation Administration had recently issued an Internet policy allowing the operational use of data from the Internet if it was provided by a Qualified Internet Communication Provider (QICP). In this regard, the potential users should be aware that the National Weather Service, which maintains the above referenced web site, was not yet a QICP. Additional information on the ftp access to the WAFS products on the NWS web site could be obtained from Walter H. Smith, Walter.Smith@noaa.gov.

Issues related to SADIS cost sharing

8.18 The expert from China, who was also a member of the SADIS Cost Recovery Administrative Group (SCRAG) from Asia Region, presented to the meeting information on an issue identified in the current mandatory scheme on the sharing of costs of SADIS from the perspective of developing countries. In particular, it was felt that the meteorological services in some developing countries were bearing a significant share of the SADIS costs in addition to their equipment investment and maintenance expenditure. Concerns were expressed that the charges were discouraging some States from using the service and that this resulted in the remaining users having to bear a larger portion of the cost. The current mechanism of calculating the shares based on ATK was considered not fully appropriate and an alternative way to calculate the share of each participating State was suggested.

8.19 The ICAO Secretariat explained to the meeting that the CNS/MET SG, being a group of technical experts, was not the appropriate group to evaluate the proposal by China, since it was an economic issue which should be dealt with by the ICAO Air Transport Bureau. It was explained that the current SADIS cost share agreement had been adopted by the ICAO Council, based on a comprehensive study by a group of experts which evaluated different possible methods. In this regard, the meeting felt that the matter raised by China and supported by the delegate from Malaysia were more appropriate to the SCRAG which was the group with the necessary expertise for discussing cost sharing matters. The meeting urged China and Malaysia, if they wished to pursue the matter with SCRAG, to support their case with a very comprehensive comparative analysis related to expected changes resulting from the proposed new method for calculating the States’ shares and to take into account ICAO’s guidance material and policies concerning the recovery of costs for provision of air navigation services.

8.20 Further information on the background of the SADIS cost recovery scheme and the ICAO's position on cost recovery for the provision of Annex 3 requirements was provided to the meeting. It was stressed that by introducing the mandatory scheme for SADIS cost sharing, it was always emphasized that the States could recover their shares through the air navigation charges. The SADIS Provider State added that currently 90 SADIS user States contributed to the SADIS cost recovery scheme and the SADIS service was considered highly effective by most of the users. The experts from Singapore and New Zealand indicated that, while the ICAO policy was that the service provided in accordance with Annex 3 was subject to cost recovery, there might be practical difficulties in some States in implementing the cost recovery through air navigation charges. Based on this discussion, the meeting considered it appropriate to encourage States to recover the costs incurred from the transition to the GRIB/BUFR coded WAFS products, the related changes in the SADIS and ISCS systems, and other costs, including the mandatory SADIS shares, following the relevant guidelines, and formulated the following Draft Conclusion:

Draft Conclusion 7-10/17 – Cost Recovery for the utilization of WAFS by the States

That, States be encouraged to include the costs associated with the receipt and provision of WAFS products, in particular, the mandatory SADIS charges, the cost for the replacement or upgrade of WAFS workstations and software required for the transition to the GRIB and BUFR coded WAFS products, the upgrade and maintenance of the SADIS/ISCS VSAT equipment, in the cost recovery for the meteorological services provided in their territory via the air navigation service charges.

Note: The recovery of the costs should be in accordance with ICAO principles and policy on the air navigation service charges.

WAFS current status and ongoing issues for resolution

8.21 The current status of the WAFS and the outstanding issues related to the transition to the so called "final" phase of the WAFS were discussed in depth at the MET Divisional Meeting (2002). It was recalled that the final phase of the WAFS required the two WAFCs to produce global SIGWX forecasts in addition to the global upper wind/temperature forecasts and transmit these direct to States by satellite broadcast.

8.22 The meeting was aware that the two WAFCs were currently producing four times daily global coverage of upper wind/temperature, tropopause, maximum wind and humidity forecasts in the GRIB code form for all the levels required in Annex 3, and upper wind/temperature forecasts in T4 facsimile format for all the areas of coverage and levels required in the regional air navigation (RAN) plans. The production of SIGWX forecasts was divided approximately equally between the two WAFCs. This involves the production of high-level SIGWX (SWH) forecasts four times daily in T4 facsimile format for all areas of coverage required in the RAN plans, and medium level SIGWX (SWM) forecasts for limited geographical areas, in accordance with Annex 3 and RAN plans.

8.23 The WAFCs were capable of issuing the WAFS SIGWX forecasts in the BUFR code form. The meeting noted that the BUFR coded SWH forecasts issued by WAFS London became operational in June 2003, while the WAFS Washington planned operational transmission of BUFR coded SWH forecasts from mid September 2003.

8.24 The expert from Japan pointed out that SIGWX forecasts from the two WAFCs did not always agree with each other over the overlapping areas and suggested that harmonization of forecast technology in addition to harmonization of SIGWX depiction should be looked into. The

expert from United States advised the meeting that actions had been ongoing to address harmonization issues during the coordination meetings between the two WAFCs and further discussion in this regard was expected at the forthcoming WAFS Operations Group (WAFSOPSG) meeting.

8.25 The enabling provisions for producing the WAFS products in digital format only, were included in the draft Amendment 73 to Annex 3 with the applicability date November 2004. In this regard, it was reminded that in order to decode and display WAFS SIGWX products in BUFR code form, it would be necessary for the States to obtain the appropriate software and for their staff to be trained in its use. Those States that develop their own software should obtain BUFR technical specifications from WAFS London.

8.26 The meeting was aware of the decision by the MET Divisional Meeting (2002) that the production/transmission of WAFS graphical output i.e. T4 facsimile charts, by the WAFCs would continue until 1 July 2005 and that a note was included in the draft Amendment 73 to Annex 3 to reflect this decision. Thus the States should develop their plans for transition to GRIB/BUFR in such a way as to meet this target date.

Regional survey on the States' plans for transition to GRIB/BUFR coded WAFS products

8.27 The meeting further reviewed the results from a regional survey that was carried out during January–May 2003 by the WAFS Transition Task Force (WAFS/T TF) in coordination with the ICAO Asia/Pacific Office, as a follow-up of APANPIRG Conclusion 13/25. The purpose of the survey was to assess the plans of the SADIS and ISCS user States in the ASIA/PAC Region to upgrade/replace their workstations and software for WAFS data processing. The questionnaire for the survey was drawn up with inputs from Australia, New Zealand, United Kingdom, Hong Kong, China and ICAO.

8.28 The survey results, based on replies from 26 States and territories in the ASIA/PAC Region, are presented in three tables as shown in Appendix L to the report. The following findings should be highlighted:

- 22 States/Territories were currently capable or had plans to become capable to operationally convert GRIB and BUFR into Wind/Temp and SIGWX charts. **Only 13** were currently capable to operationally convert GRIB into Wind/Temp charts, and the number in respect of BUFR was even lower – **only 7**. In other words, **83%** of States/Territories had yet to be capable to operationally convert BUFR coded WAFS products into SIGWX charts and **69%** of States/Territories had yet to be capable to operationally convert GRIB coded WAFS products into Wind/Temp charts;
- in respect of training, 14 returns indicated requirements for training in GRIB and/or BUFR;
- in respect of procurement plans, 15 States/Territories had plans to purchase BUFR visualization software and 4 had plans to upgrade their ISCS STAR 4 workstations;
- it was noted that only 4 States/Territories currently utilized the SADIS ftp back-up service;

- a number of States expressed difficulties in having operational GRIB and/or BUFR capability before the July 2005 time frame (Lao PDR and Vanuatu) or indicated that more time might be required for the transition (Fiji, Maldives, and Nepal).

As an update to the survey results in Appendix L, the expert from Malaysia advised the meeting that their installation of the ISCS workstation and software had been completed. Based on the survey results obtained, the meeting found it necessary to stress that, as the anticipated date of removal of T4 facsimile products from the WAFS satellite broadcast is only two years from now, it is imperative that:

- a) all States should be urged to start the necessary preparation for the migration to GRIB and BUFR as soon as possible, if they have not already done so; and
- b) considerable assistance in terms of the provision of equipment, software and training is urgently required for States having difficulties in the migration to GRIB and BUFR.

8.29 The observer from WMO informed the meeting that, only five States from the ASIA/PAC Region had approached WMO requesting assistance under the WMO Voluntary Cooperation Programme (VCP). He advised that, in view of the very short time left to the transition to the GRIB/BUFR coded WAFS products, any further request for VCP assistance should be submitted to WMO as soon as possible. The processing of such requests by WMO would be significantly facilitated if the States concerned could contact potential donors and subsequently inform WMO. The meeting noted this important information and formulated the following Draft Conclusion:

Draft Conclusion 7-10/18 – States’ Actions for the Migration to the new ISCS and the Operational Use of GRIB and BUFR coded WAFS Products

That,

- a) ASIA/PAC States be urged to start the necessary preparations for the migration to the operational use of GRIB and BUFR coded WAFS products as a matter of urgency, if they have not already done so;
- b) States having difficulties in the migration to the operational use of GRIB and BUFR coded WAFS products be urged to urgently approach WMO for assistance under the WMO Voluntary Cooperation Programme (VCP).

Note: In order to expedite WMO consideration of VCP requests, States are encouraged to contact potential donors and subsequently inform WMO.

BUFR coded SIGWX forecasts

8.30 The meeting was informed that Hong Kong, China had been comparing SIGWX charts generated from BUFR coded data with the corresponding T4 facsimile charts provided by WAFS London and identified technical issues in the following aspects:

- interpolation of jetstreams between specified points;
- depiction of flight levels, wind barbs and change bars of jetstreams;
- problems in depiction of jetstreams over chart area "K";
- edge effects; and
- overlapping of features

8.31 Examples were provided by the expert from Hong Kong, China to illustrate these issues. The expert from UK informed the meeting of the actions being taken to address these issues and that WAFS London had been tasked by the SADISOPSG to carry out a further evaluation of the different BUFR visualization software and provide updates on the SADIS website. WAFS London would provide in a few weeks time revised specifications/standards on BUFR decoding and visualization to software manufacturers and to those States which chose to develop their own software. As regards the visualization of the BUFR SIGWX forecasts generated by WAFS Washington, the meeting was informed of the actions taken to standardize the BUFR code specifications for SIGWX products by the two WAFS. Thus the results from the evaluation carried out by the Met Office were expected to be applicable to the BUFR products from both WAFS.

8.32 The meeting agreed that the further evaluation by WAFS London would be an important task to ascertain that the SIGWX charts generated by the available software would meet the requirements of Annex 3 in full without the need for significant manual inputs. As regards the extent of the manual inputs to be required for generation of SIGWX charts from BUFR coded WAFS products, the meeting felt that States had to be made aware of the possible changes to the current operational procedures in handling WAFS SIGWX products in BUFR codes instead of T4 facsimile charts. At the same time, the SIGWX chart generation process from BUFR coded data, in particular for the generation of charts for the standard ICAO areas, should be automated to the extent possible. In this connection, the meeting formulated the following Draft Conclusion:

**Draft Conclusion 7-10/19 – Automatic Production of SIGWX Charts
from BUFR Coded WAFS Products**

That, the WAFSOPSG be invited to consider the requirement for automatic production of SIGWX charts for the standard ICAO chart areas from BUFR coded WAFS products to be included into the set of minimum requirements to be achieved by the WAFS workstation manufacturers.

GRIB/BUFR training

8.33 The meeting was informed about the ASIA/PAC SADIS Workstation Software Training for decoding of WAFS products in the GRIB and BUFR codes held in Bangkok, Thailand from 18 to 20 November 2002. The training was held as part of the ASIA/PAC WAFS Transition Plan and Procedures and was organized as a follow-up action of APANPIRG Conclusion 12/22. The training was provided by the UK, as SADIS provider State, the organization and programme of the event being coordinated with the WMO. The initial plan for the training was to cover the GRIB coded products only. However, after coordination with the SADIS Provider State and in order to save funds for the participating States, it was agreed that both GRIB and BUFR coded WAFS products would be covered by one training event. The training was attended by 23 experts from 11 SADIS user States and 2 special administrative regions. The meeting expressed its appreciation to the UK for providing instructors for the training and for the financial support for participants.

8.34 The meeting was also informed by the expert of the US, the ISCS provider State, that a similar training event for decoding and visualization of WAFS products in the GRIB and BUFR codes would be provided in late-2004/early-2005 after most of the ISCS user States had upgraded

their ISCS workstations and received initial training from the workstation suppliers. Noting from the results of the regional survey, which was conducted after the training in November 2002, that a number of SADIS user States in the ASIA/PAC Region indicated that training on GRIB and/or BUFR was still required, the meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/20 – GRIB/BUFR Training

That, the SADIS and ISCS provider States be invited to provide further training on the operational use of GRIB and BUFR coded WAFS products for the SADIS user States in the ASIA/PAC Regions in coordination with ICAO and WMO.

Note: It is desirable that the above training is organized conjointly by the SADIS and ISCS provider States for both SADIS and ISCS user States in the ASIA/PAC Region in late 2004/early 2005.

Development of the WAFS beyond Amendment 73

8.35 The meeting was aware of the views expressed at the MET Divisional Meeting (2002) on the WAFS development beyond Amendment 73 to Annex 3, that the WAFS should not be “frozen in time” and that full advantage should be taken of the technological developments to improve the WAFS. With the application of Amendment 73 to Annex 3, all reference to the so-called “final” phase of WAFS was considered redundant and counter-productive and should be eliminated, and the development of WAFS should continue in the future to meet evolving operational requirements as it had done in the past.

8.36 In view of this, the WAFS Operations Group (WAFSOPSG) was established as a successor of the WAFS Study Group (WAFSSG) to provide assistance in the planning and development of the WAFS. The meeting was informed that Australia, as an ex-RAFC Provider State, and Singapore, as an user State, would nominate members to WAFSOPSG from the ASIA/PAC Region.

8.37 With the establishment of the WAFSOPSG it was likely that the role of the PIRGs in WAFS planning would become of lesser importance. However, in respect of WAFS implementation, the CNS/MET SG was expected to continue to address the ongoing issues, including in particular, the States’ progress in their capability to receive, decode, and process WAFS output products in the GRIB and BUFR code forms. In view of the above developments, the meeting reviewed the TORs and the work programme of the WAFS/T TF and agreed that the group should continue its work. Moreover, the results of the GRIB/BUFR regional survey showed that urgent follow-up actions were required so that the ASIA/PAC Region would be ready for the migration to GRIB and BUFR by mid-2005. The meeting agreed also that the WAFS/T TF should focus on implementation aspects and amended the TORs of the group accordingly. The meeting formulated the following decision on this subject:

Decision 7-10/21 – ASIA/PAC WAFS Implementation Task Force

That,

- a) the ASIA/PAC WAFS Transition Task Force be renamed as ASIA/PAC WAFS Implementation Task Force (WAFS/I TF) with the TORs and Work Programme as given in Appendix M to this report.

- b) the ASIA/PAC WAFS Transition Plan and Procedures be renamed as ASIA/PAC WAFS Implementation Plan and Procedures and amended as shown in Appendix N to the report to reflect the changes in the plans and schedules of the two WAFCs in the migration to GRIB and BUFR.

8.38 WAFS/I TF is composed by experts from: Australia, Hong Kong, China, India, Japan, New Zealand, Singapore, Thailand, United Kingdom and United States. IATA is invited to participate in the work of the Task Force. Mr. SHUN Chi-ming, expert from Hong Kong, China was nominated as Chairman of the Task Force.

Amendment of WAFS provisions in the Basic ANP and FASID

8.39 In view of the developments over the last few years, the meeting agreed that the regional procedures related to WAFS in the ASIA/PAC Basic ANP and FASID needed to be updated and formulated the following Draft Conclusion:

**Draft Conclusion 7-10/22 – Amendment of regional procedures
related to WAFS in the ASIA/PAC
Basic ANP and FASID**

That, the ASIA/PAC Basic ANP and FASID (Doc 9673) be amended as indicated in Appendix O to the report.

Other issues related to WAFS

8.40 The meeting was informed that in one occasion the notification message for a significant change in the WAFS London SIGWX products schedule was not received in time by an ISCS user State and thus this State was not able to undertake the necessary preparation for this change. It was identified that for this particular case an administrative message had been sent via SADIS but this message was not received by the ISCS users. In this regard, the meeting felt that a notification procedure should be developed to ensure that all States would be informed of important operational changes in the WAFS well in advance and formulated the following Draft Conclusion:

**Draft Conclusion 7-10/23 – Notification for significant changes in
the WAFS operation**

That, WAFSOPSG is invited to develop adequate notification procedure for significant changes in the WAFS operation to ensure that all States/users concerned are informed of such changes with enough lead time in order to prepare for those changes.

The expert from the UK informed the meeting that action had been taken to establish a web based one-month archive facility for administrative messages which might be able to address this issue.

8.41 The meeting was briefed on the WAFS London backup procedures during the ongoing transition from Bracknell to Exeter within the period May to November 2003. The relocation of WAFS London to Exeter would provide advantages that included access to state-of-the-art production facilities with a dedicated backup infrastructure so that the users' exposure to risk throughout the relocation and afterwards were minimized.

8.42 The expert from United States presented background information on the ongoing research in the United States for providing graphical products such as non-WAFS graphical area

forecast and GAMET to users. It has been envisioned that graphics were to be the principal or primary product for operations and text messages would be supplemental to support those users who could not access the graphics to ensure that the minimum level of requirements as stated in Annex 3 were met.

8.43 The meeting was informed that the regional requirements for medium-level SIGWX forecasts would be tabled for discussion at the coming WAFSOPSG meeting. The observer from IATA advised that there was currently no requirement for medium-level SIGWX forecasts for the ASIA/PAC region and that the development of specialized WAFS products for turbulence and icing forecast on a global scale would be discussed at the coming WAFSOPSG meeting.

8.44 The expert from WAFC Washington informed the meeting that examples of the proposed area “L” SWH chart would be provided at the first meeting of the WAFSOPSG later this year. The requirement for Chart "L" has already been stated by the EANPG (Conclusion 41/11 refers). IATA and other user groups would be requested to validate the requirements for the new chart area based on the expected usage and utility. Subject to validation of the requirement for the chart area “L”, it was expected that the WAFSOPSG would take the appropriate action for its issuance by the WAFCs.

Agenda Item 9: Exchange of OPMET Information

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

First meeting of the OPMET Exchange Task Force (OPMET/E TF/1)

9.2 It was recalled that the OPMET Exchange Task Force was established by APANPIRG Decision 13/28 to address issues related to the ROBEX scheme and other OPMET exchanges. The Task Force held its first meeting in Bangkok from 19 to 21 February 2003. The meeting was attended by 20 experts from Australia, China, Fiji, Japan, Singapore, Thailand, United Kingdom, United States, IATA and the Bulletin Management Group of the METG, EUR Region.

9.3 The OPMET/E TF/1 meeting carried out a comprehensive review of the current status of the OPMET exchange schemes in the ASIA/PAC Region and the exchange with the other ICAO regions. The experts from the ASIA/PAC OPMET data banks provided information on the bulletin content and access procedures. Detailed information on the OPMET management in the EUR Region was provided by the observers from the EUR Bulletin Management Group (EUR BMG).

9.4 The OPMET/E TF/1 meeting agreed that the ROBEX scheme should continue be used for the purpose of scheduled regular OPMET exchange within the ASIA/PAC Region. In addition to the current data types METAR (SA), long TAF (FT) and AIREP (UA), the scheme should accommodate SPECI (SP) and short TAF (FC). In the future, the scheme should be capable of carrying all OPMET data types, including the non-regular messages.

9.5 As regards the current structure of the ROBEX scheme, the meeting stressed on the urgent need for optimization and improved management. It was decided that in place of the current variety of collection centres (MCCs for METAR, TCCs for TAFs and SCCs (sub-collection centres)), a number of ROBEX centres should be established. Each ROBEX centre should be responsible for all OPMET data types within its area of responsibility. It was expected that the second meeting of the OPMET/E TF would finalize the proposal for the new structure of the ROBEX scheme.

ROBEX Tables

9.6 A new format of the ROBEX tables for METAR and TAF exchange, proposed by OPMET/E TF, was presented to the meeting for approval for inclusion in the new edition of the ROBEX Handbook. An additional table was prepared showing the current correspondence between the ASIA/PAC AOP1 Table (FASID Table MET 1A) and the current regular exchange of METAR and TAF under ROBEX. This table would be used to illustrate the progress on the APANPIRG Conclusion 10/23, which called for all ASIA/PAC aerodromes listed in the FASID Table MET 1A to be included in the ROBEX exchange.

9.7 The tables presented to the meeting were coordinated with the ROBEX centres in May and June 2003 and updated accordingly. The members of the group provided additional input for correcting some entries in the tables and the meeting formulated a Draft Conclusion as follows:

Draft Conclusion 7-10/24 – Updated ROBEX Tables

That, the new tables for the METAR and TAF exchange, and the table for the availability of METAR and TAF against the requirements in the ASIA/PAC AOP1 Table, as shown in Appendix P to the report, be included in the new edition of the ROBEX Handbook.

ROBEX bulletin structure

9.8 The meeting discussed further the need for changes in the ROBEX bulletins. It was noted that the WMO headers of some ROBEX bulletin should be corrected to reflect their multinational or national content, according to WMO Manual on the Global Telecommunication System (WMO No. 386). It was explained in this regard that any changes in the bulletins should be coordinated through the ICAO Regional Office. The OPMET/E TF/1 meeting considered that bulletins, containing information from a single State were more convenient in terms of management (e.g., for tracing errors or introducing changes in the bulletin content) and recommended that separate bulletins be created for States with three or more aerodromes.

9.9 The expert from Thailand informed the meeting of the introduction in the ROBEX exchange of three new METAR bulletins (SATH31, SATH32 and SATH33) and three new TAF bulletins (FTTH31, FTTH32 and FTTH33). By introducing these new bulletins, the requirements for METAR and TAF from Thailand as specified in the FASID Table MET 1A and in the SADIS User Guide Annex 1, would be satisfied.

Inter-regional exchange

9.10 The meeting was informed of the organization of the inter-regional OPMET exchange, as agreed by the OPMET/E TF/1 meeting. It would be carried out by inter-regional OPMET gateways, as follows:

- Singapore ROBEX centre would be the inter-regional OPMET Gateway for EUR Region, i.e., all ASIA/PAC OPMET data would be sent to London by Singapore;
- Tokyo ROBEX centre would be the inter-regional OPMET gateway for NAM Region and would send all ASIA/PAC OPMET data to Washington; and
- Bangkok ROBEX centre would be the inter-regional OPMET gateway for MID and AFI Region. Since there was no centralized inter-regional exchange for these two Regions, the current ODREPs should continue to be used. It was clarified that currently Bangkok did not exchange data with AFI and the need for such exchange should be further validated.

9.11 Concerns were expressed regarding the concept of a “single inter-regional gateway”. In particular, regarding the exchange between EUR and ASIA/PAC if Singapore centre had a failure all ASIA/PAC data would be missing in EUR and on SADIS. The meeting felt that though the AFTN itself was highly redundant, there was still a need for a back up centre to take over if Singapore had a problem. It was agreed that Bangkok RODB would provide this back up and would make the ASIA/PAC OPMET data available to EUR immediately after notified for a failure of the Singapore centre.

9.12 The meeting was informed of the plans of National Weather Service (NWS) in the United States to make significant operational changes to its NWS Telecommunication Gateway. The new telecommunications gateway would not support the current AFTN request-reply service. In addition to providing OPMET data on the WAFS satellite broadcast over the ISCS, United States would make OPMET data available through a File Transfer Protocol (ftp) server or Hypertext Transfer Protocol (http) via the Internet in replacement of the current request-reply feature of the Washington OPMET Data Bank. The new NWS telecommunications gateway was scheduled to become operational between July and September 2005 and after that the AFTN request-reply service would no longer be available. It was recalled by the Secretariat in this regard that the Annex 3

provisions for the OPMET exchange required that the ICAO aeronautical fixed system (AFS) be used for the exchange of the OPMET information. The expert from United States clarified that the planned changes would reflect only on the request-reply service to the Washington OPMET data bank. Further, it was the United States understanding that ICAO was in the process of establishing a study group to recommend a set of guidelines on the aviation use of the public Internet as a means of ground-ground communication for collection, organization, dissemination and exchange of various categories of aeronautical data. United States would be participating in this study group to help support the use of the Internet.

Regional OPMET Data Banks (RODB)

9.13 The meeting agreed that all ASIA/PAC RODBs should handle all OPMET data types, namely: SA, SP, FT, FC, WS, WC, WV, FK, FV, UA.

9.14 Mirroring of data between RODBs was found necessary in order to facilitate the users' access to all data available in the region. It was agreed that the RODBs Tokyo, Singapore and Bangkok should start working on the procedure of mirroring of data banks content and the other two data banks should join on a later stage. The three RODBs should decide on the methods of mirroring.

OPMET Monitoring Trials

9.15 The OPMET/E TF/1 Meeting proposed that OPMET monitoring procedures similar to those in use in the EUR Region should be developed. It was agreed that Bangkok RODB should perform the first monitoring trial on the regular METAR and TAF exchange. The OPMET monitoring was held on 1st July 2003 for 24 hours. During this period all received METAR and TAF bulletins by Bangkok RODB were filed and analysed in regard to the availability of METAR and TAFs from the aerodromes required by the ROBEX tables. The format of the WMO header and the dissemination time were also monitored. The meeting was presented with tables showing the details of this first trial.

9.16 The meeting expressed appreciation to the Bangkok RODB for carrying out the trial and agreed that the monitoring procedures for both regular and non-regular OPMET exchange should continue be developed by the OPMET/E TF.

Review of regional guidance material on OPMET exchange

9.17 The meeting was informed that the draft new edition of the ROBEX Handbook with the updated ROBEX tables and other changes, reflecting the decisions of the OPMET/E TF, would be finalized by the end of September 2003 and after review by the States would be published by ICAO. An electronic version of the Handbook would be made available on the ICAO web site.

Requirement for regular exchange of OPMET data

9.18 The meeting noted that the provision for the inclusion of METAR, SPECI and TAF in the regular OPMET exchange only if "required by five or more flights per week", was removed with the new edition of the ASIA/PAC FASID. It was recalled that this provision was developed long ago when the AFTN circuits were of very limited capacity and it was important to prevent the AFTN of overloading. The meeting was aware that the current AFTN capacity was enough to accommodate much more OPMET information. It was also recalled that the current user requirement, as reflected in APANPIRG Conclusion 10/23, was that all international aerodromes listed in Table MET 1A of the ASIA/PAC Air Navigation Plan (ANP) should be included in the OPMET exchange. It was further explained that for the aerodromes, which do not operate continuously on 24-hour basis the OPMET information should be made available for the exchange when produced by the corresponding meteorological office.

Inclusion of the 9-hour TAF in the ROBEX exchange

9.19 The meeting was informed by the expert from IATA that 9-hour TAFs, which were issued by some States in the ASIA/PAC Region were required by the operators. The meeting was aware that a number of States in the Region were issuing 9-hour (short) TAFs (FC TAF), however, so far there was no formal requirement for these forecasts in the Regional ANP and that is why, they were not included in the ROBEX exchange. The meeting agreed that the 9-hour TAFs were useful for the flights of lesser duration, since they were shorter and updated more frequently than the 18/24 hour TAFs. The meeting decided that the 9-hour TAFs should be added to the ROBEX exchange and that the OPMET/E TF should make the necessary coordination and updates of the relevant documentation. The meeting formulated the following draft conclusion:

Draft Conclusion 7-10/25 – Inclusion of 9-hour TAF in the ROBEX exchange

That, the States who are issuing 9-hour TAFs, be invited to include these bulletins into the regular exchange under the ROBEX scheme.

Future work programme of the OPMET Exchange Task Force

9.20 The meeting reviewed the terms of reference and work programme of the OPMET Exchange Task Force. It was recalled that the Bulletin Management Group (BMG) in the EUR Region has been working for more than 7 years providing continuous management and support of the OPMET exchange. It was agreed that the OPMET exchange and the ROBEX scheme needed continuous management and that in this regard the more appropriate name of the OPMET Exchange Task Force would be OPMET Management Task Force. The meeting also updated the terms of reference of the task force and adopted the following Decision:

Decision 7-10/26 – OPMET Management Task Force

That, the ASIA/PAC OPMET Exchange Task Force be renamed to ASIA/PAC OPMET Management Task Force with revised terms of reference, work programme and composition as shown in the Appendix Q to the Report.

Agenda Item 10: Implementation of ICAO Warning Systems

- 1) International Airways Volcano Watch (IAVW)**
- 2) tropical cyclone advisories and warnings**

Issues related to SIGMET

10.1 The meeting recalled that the MET Divisional Meeting (2002) noted that some of the ICAO PIRGs had identified serious problems with the implementation of the issuance of SIGMETs by the meteorological watch offices (MWO) in certain Contracting States. The problems were related to all types of SIGMET but were most noticeable for SIGMETs for volcanic ash. The meeting emphasized that this problem was a serious safety issue and formulated two recommendations on the subject. ICAO gave urgent consideration to the organization of special implementation projects recommended by the PIRGs to assist States in fully implementing the SIGMET provisions in Annex 3. Regional surveys of the issuance of SIGMET messages in order to identify any deficiencies, as well as update of the regional SIGMET guides were amongst other actions to be taken in resolving the SIGMET related problems.

10.2 As follow up of the MET Divisional Meeting recommendations a new edition of the ASIA/PAC Regional SIGMET Guide has been prepared aimed at providing assistance to the MWOs in better understanding the SIGMET format, the procedures for SIGMET issuance and dissemination, and the responsibilities and coordination between the MWOs and the associated ATS units. The meeting reviewed the draft new edition of the Regional SIGMET Guide and agreed upon its publication by ICAO. It was suggested that this document should be kept up-to-date with regular reviews. With the explanations provided on the format and procedures related to SIGMET, the operations of the MWOs should be critically reviewed by the States to ensure their compliance with the requirements. The members of the group were encouraged to communicate to the Secretariat any suggestion for improvement of the document after reviewed in detail by their States. After this discussion, the meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/27 – ASIA/PAC Regional SIGMET Guide

That,

- a) ICAO publish the new version of the ASIA/PAC Regional SIGMET Guide as shown in Appendix R to the report in accordance with the established procedures; and
- b) based on the guidance provided in the ASIA/PAC Regional SIGMET Guide, the States be invited to review the operations of the MWOs, which have been designated by the States' meteorological authorities for inclusion in the ASIA/PAC Regional ANP, and to ensure that SIGMET messages are issued in full compliance with the Annex 3 provisions and the requirements stated in the Regional ANP.

10.3 The meeting was further informed of the analysis carried out by the ICAO Regional Office on the SIGMET availability and format for a limited period of time in the first half of 2003. Through this analysis two common problems regarding the implementation of SIGMET requirements by the MWOs were identified, as follows:

- SIGMETs were not issued at all or issued only occasionally; or
- SIGMETs were issued but their format was not compliant with Annex 3.

It was further identified that there existed a large variety of discrepancies and errors in the format of the SIGMET messages issued by the MWOs virtually in all ICAO regions.

10.4 Particular attention was given to the existing format discrepancies in regard to the geographical part of the message, which was subject of greatest number of errors. It was considered in this regard, that the current SIGMET format as specified by Annex 3 might need some amendments aimed at standardizing the reporting of the geographical information in SIGMET. Examples of the necessary amendments to the format were provided to the meeting. The meeting agreed that the proposed amendments to the SIGMET format would facilitate the MWOs in the preparation of SIGMET messages and formulated the following Draft Conclusion:

Draft Conclusion 7-10/28 – Amendments to the SIGMET format

That, ICAO be invited to consider modifications to the SIGMET format specified by Annex 3, in particular to the part of the SIGMET message related to the geographical location of the weather phenomenon, for which the SIGMET is issued, aimed at facilitating the MWOs in the preparation of the SIGMET information and further standardization of the message format.

Note: Examples of proposed changes to the SIGMET format are shown in Appendix S to the report.

10.5 The meeting discussed further the need for a regional survey to identify all existing deficiencies related to the issuance of SIGMET by the MWOs. The results of such survey would be used in deciding on the further assistance to States needed. In this regard, the meeting formulated the following Decision:

Decision 7-10/29 – Regional SIGMET survey

That, the Task Force on the Implementation of the volcanic ash and tropical cyclone advisories and SIGMETs (VA/TC Implementation TF) of the CNS/MET SG conduct a survey on the implementation of the SIGMET provisions specified by Annex 3 and ASIA/PAC Regional ANP, in terms of availability and quality of the SIGMET information provided by the States in the ASIA/PAC Region.

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

10.6 The meeting recalled that the implementation of the IAVW in the ASIA/PAC Region was undertaken by five Volcanic Ash Advisories Centres (VAAC): Anchorage, Darwin, Tokyo, Washington and Wellington, and a number of MWOs in the States. The Rapporteur of the Volcanic Ash Task Force (VA TF) presented a statistical analysis on the issuance of volcanic ash advisories by all VAACs in the Region for the period 1998 – 2002, as shown in Appendix T to the report. It was seen from the presented figures that the VAACs have been performing very well during this period and as far as the advisories were concerned the IAVW was considered fully implemented in the Region.

10.7 The Rapporteur of the VA TF informed further that a questionnaire has been sent to the States in the ASIA/PAC Region, in coordination with the ICAO Regional Office. The purpose of the questionnaire was to receive feed-back on the utilization by the MWOs of the advisories received from the VAACs and the procedures of issuance of VA SIGMETs. Though not all the States replied to the questionnaire, it was possible to present some preliminary results, as shown in Appendix T to

the report. The VA TF was preparing also a directory of MWOs concerned for further communication on the volcanic ash issues.

10.8 One of the findings of this survey was that most of the MWOs issue volcanic ash SIGMETs very rarely since volcanic ash was a rare event for their areas of responsibility. In this respect, concern was expressed that the personnel of the MWOs, who did not issue volcanic ash SIGMET for long periods of time, might not be prepared to do so in the rare but very important cases when SIGMET would be necessary. It was suggested that, in order to keep the system ready for action, periodic tests and exercises should be conducted with the participation of the VAACs and the MWOs under their areas of responsibility. The meeting requested that the VA TF develop further procedures for such tests.

ASIA/PAC Special Implementation Project (SIP) on SIGMET for volcanic ash

10.9 The meeting recalled the APANPIRG Conclusion 11/33 that called for an ICAO SIP to address the deficiencies related to VA SIGMETs. The CNS/MET SG/6 Meeting, 2002, reiterated the need for such a SIP and advised that it should be focused on providing assistance to the States in the most volcanic active areas in coordination with the VAACs. Based on this, a revised proposal, which took into account also the recommendations on the subject by the MET Divisional Meeting (2002), was submitted to ICAO and was consequently approved for the year 2003. Due to the limited budget of the SIP it was necessary to be conducted by the ICAO Regional Office, Bangkok.

10.10 The SIP would be conducted through visits to selected States, with a duration of 3 to 5 days, aimed at identifying the problems in the implementation of the SIGMET procedures and providing on-site assistance to develop actions for eliminating the existing deficiencies. The States with the highest volcanic activity to which visits would be conducted were the Russian Federation, Indonesia, Papua New Guinea, Japan and Philippines.

10.11 The SIP started in April 2003 with visits by the ICAO Regional Officer, Aeronautical Meteorology to Japan and Philippines. Some preliminary findings based on these missions were presented to the meeting. A full report, prepared in coordination with the VA TF would be presented at the next CNS/MET meeting in 2004.

Establishment of the IAVWOPSG and modus operandi between the IAVWOPSG and the PIRGs

10.12 The meeting was informed of the establishment of the International Airways Volcano Watch Operations Group (IAVWOPSG) in response to recommendation 1/22 of the MET Divisional Meeting (2002). With this, the future regional planning of the IAVW would become *de facto* global, and the IAVW planning to be undertaken by the PIRGs would become of lesser importance.

10.13 It was further explained that with regard to the IAVW implementation, the PIRGs' role would not change and their MET sub-groups should continue to address all the implementation issues, in particular, regarding the States' progress in their capability to issue volcanic ash advisories (VAAC Provider States) and SIGMETs for volcanic ash clouds. In this respect, it was stressed that the active regional participation by the States concerned in the work of the IAVWOPSG was very important.

10.14 In view of the above changes of the responsibilities related to IAVW planning and implementation, the meeting considered the future of the Volcanic Ash Task Force, established by Decision 13/31 of APANPIRG. The meeting agreed that there were a number of implementation issues regarding the volcanic ash advisories and SIGMETs in the Region that should be addressed by a group of experts. It was further discussed that similar implementation problems existed in regard to the tropical

cyclones advisories and SIGMETs and that it would be feasible that one task force could address the issues related to both tropical cyclones and volcanic ash. Thus, it was proposed to disband the current VA TF and to replace it by a new task force on the implementation of volcanic ash and tropical cyclone advisories and SIGMETs. The meeting formulated the following draft decision:

Draft Decision 7-10/30 – Task Force on the implementation of volcanic ash and tropical cyclone advisories and warnings (VA/TC Implementation TF)

That,

- a) the Volcanic Ash Task Force, established by Decision 13/31 of APANPIRG be disbanded; and
- b) a Task Force on the implementation of the volcanic ash and tropical cyclone advisories and SIGMETs in the ASIA/PAC region (VA/TC Implementation TF) be established with terms of reference, work programme and composition as shown in Appendix U to the Report.

10.15 Some members of the task force pointed out that more than one expert should be nominated by their States since the task force was covering two disciplines. It was agreed that it would be at the discretion of the States to provide appropriate membership to the task force.

Harmonization of the format of VA advisories and TC advisories

10.16 The meeting noted that some differences existed in the format of the field tags in the templates for the TC and VA advisories specified in Annex 3. Thus, the TC advisory template tags contained abbreviations, while the VA advisory template contained more free text, e.g., the date/time field in the TC advisory template was indicated with the abbreviation “DTG:”, while in the VA template it was indicated as “ISSUED:” It was also recognized that the VA advisory contained a “remark” section and no such section was present in the TC advisory template. Since many MWOs were using both types of advisories, it was considered that their formats should be harmonized as regards to the common field tags. In this regard, the meeting agreed upon the following Draft Conclusion:

Draft Conclusion 7/10/31 – Harmonization of the format of volcanic ash and tropical cyclone advisories

That, IAVW Operations Group (IAVWOPSG) be invited to review the format of the volcanic ash and tropical cyclone advisories and propose changes aimed at harmonizing the format of those elements which are common for both types of advisory messages.

Recent developments of the IAVW services in the States

10.17 The meeting noted the information provided by the expert from Japan on recent developments at VAAC Tokyo. VAAC Tokyo started forwarding VA advisories issued by adjacent VAACs to MWOs within the Tokyo area of responsibility, when these advisories indicated possible affect of the VA cloud on the flight operations within the area of responsibility of the MWOs concerned. This practice was initiated after the first eruption in May 2003 of Anatahan Volcano, Northern Mariana Islands, located within the area of responsibility of VAAC Washington. VAAC Tokyo was using WMO header ‘FVFE01’ for the retransmitted advisories issued by other VAACs.

10.18 The meeting was informed also of the plans of VAAC Tokyo to comply with Annex 3 provisions regarding the issuance of VA advisories regardless the height of the VA cloud. So far, VAAC Tokyo has been issuing VA advisories for international dissemination only when a volcanic plume raised higher than 5,000m (15,000ft) above sea level, assuming that international flights normally used higher levels. The low-level VA advisories (below 5,000 m/ 15,000 ft) have been issued for the domestic flights only. However, the Annex 3 did not provide any criterion of VA plume height for the issuance of advisories, since it was recognized that even low level VA cloud could be dangerous for the airplanes. To comply with the Annex 3 provisions, VAAC Tokyo was going to abolish height threshold of VA advisories for international flights this autumn. Consequently, VAAC Tokyo would issue VA advisory for international dissemination regardless of the height of volcanic ash plume for all the volcanic eruptions within its area of responsibility.

10.19 The expert from New Zealand informed the meeting of the difficulties experienced by the Wellington VAAC and Wellington MWO in the provision of service (volcanic ash advisories and warnings) south of 60 degrees South. It was explained also that the flight operations in this area were very infrequent. New Zealand was comfortable, that due to the absence of information in the extreme south of the Wellington VAAC area, and knowing that there were extremely little civilian international flight operations in the area, a note was introduced in FASID Table Met 3 – Volcanic Ash Advisory Areas, indicating that “*coverage south of 60°S latitude is currently not feasible*”. For very much the same reasons New Zealand would prefer that the ASIA/PAC FASID Table Met 1B – Meteorological Watch Offices, be amended with a similar note for the limitation of Wellington MWO coverage of the Auckland Oceanic FIR (NZZO) south of 60°S. The meeting agreed with the request by New Zealand and formulated a Draft Conclusion as follows:

**Draft Conclusion 7-10/32 – Amendment to FASID Table MET 1B
in regard to the service provided by
the meteorological watch office
Wellington**

That, FASID Table MET 1B be amended by adding a note for MWO
Wellington, New Zealand, as shown in the Appendix V to the report.

Implementation of Annex 3 format of the TC advisories by the TCACs

10.20 The meeting recalled that the MET Divisional Meeting (2002) noted that some of the designated Tropical Cyclone Advisory Centres (TCAC) did not yet issue their TC advisories in the format required by ICAO. In this regard, a recommendation was adopted, which invited all TCAC Provider States to implement the Annex 3 format for the TC advisories for aviation. As a follow-up of this recommendation, a letter was sent by the ICAO Regional Office to the TCAC Provider States in the ASIA/PAC region calling for implementation of the issuance of TC advisories for aviation in full accordance with the format spelled out in Annex 3, paragraph 3.7.2. The letter also emphasised that the forecasts of the position of the TC centre should be for fixed valid times of 12, 18 and 24 hours after the time of issuance of the advisory.

10.21 Most of the TCACs in the ASIA/PAC cooperated fully in implementing the standard format of the TC advisories according to Annex 3. TCACs Darwin, Nadi and Tokyo have implemented the Annex 3 format in the beginning of 2003. The delegate from United States advised the meeting that in late May 2003 the United States TCACs added the 18-hour forecast of the TC centre to bring the TC advisories into full compliance with the information content and format in Annex 3. The +18-hour position of the TC centre was a linear interpolation between the +12 and +24-hour model forecast positions. The meeting was also informed of the WMO headings used by the TCAC Honolulu and TCAC Miami for the TC advisory messages.

10.22 The expert from Japan informed the meeting of the improvement of the tropical cyclone track forecast by TCAC Tokyo. Operational track forecasts for 26 tropical cyclones, which attained tropical storm intensity or higher in 2002, were verified against the best track data prepared by JMA. The annual mean error of the 24-hour forecast of the TC centre position was 138 km, which was the smallest since TCAC Tokyo started its operations. This was mainly explained by the improvement of the initial fields of numerical weather prediction models of JMA.

10.23 The meeting expressed appreciation to the different parties involved in achieving the progress in the implementation of the TC advisories: TCAC Provider States, WMO and IATA who all contributed in their respective capacities.

Outstanding issues

Implementation of TCAC New Delhi

10.24 The meeting expressed serious concern on the non-implementation of the TC advisories for aviation by TCAC New Delhi. The lack of TC advisories for the Bay of Bengal and Arabian Sea was considered a serious deficiency in view of the large number of important air routes over the region. The Secretariat advised the meeting that this issue was addressed from ATM perspective by the ATA/AIS/SAR SG/13 meeting in June 2003. It was recognized that, the information for tropical cyclones was of vital importance for the planning and implementation of Large-Scale Weather Deviation Contingency Procedures by the Area Control Centres (ACC) in this Region. In view of the above, the meeting agreed that the urgent implementation of the requirements for TC advisories by TCAC New Delhi should be given high priority and formulated a Draft Conclusion, as follows:

Draft Conclusion 7-10/33 – Implementation of the requirement for TC advisories by TCAC New Delhi

That, India, as TCAC Provider State, is invited to implement, as a matter of urgency, the requirement for issuance of TC advisories by TCAC New Delhi as specified in the ASIA/PAC Basic ANP and FASID (Doc 9673), following the provisions of Annex 3, regarding the format of these advisories.

The meeting was further advised that the lack of TC advisories by TC New Delhi would be included in the List of Deficiencies for ASIA/PAC Region.

Inclusion of 18-hour forecast in the TC advisory

10.25 The meeting was informed that TCAC Tokyo had implemented the Annex 3 format for the tropical cyclone advisories as required. However, the centre has not yet included the 18-hour forecast in the advisories. The reason was that the operational model used for forecasting the tropical cyclone movement did not provide output for the +18 hour time slot. The meeting was advised that the same problem had been experienced by TCACs Honolulu and Miami and that, in order to overcome it, these two centres decided to use linear interpolation of the model forecast positions at +12 and +24 hours. It was considered that, though not fully accurate, this method was acceptable for the time being and the expert from Japan took note for consideration of similar solution by TCAC Tokyo.

Correct use of the TC name

10.26 The meeting discussed further the use of the tropical cyclone name in the TC advisories and SIGMETs. Two issues were addressed in this regard. The first issue was the operational practice of TCAC Tokyo to use additional information in the TC name field of the TC advisory, while the Annex 3 format required only the name of the TC in this field. It was explained that TCAC Tokyo was following the procedure for TC identification as given in the *Typhoon Committee Operational Manual* (WMO/TD-No. 196), which prescribed that the TC identification should include a name followed by a 4-digit group in brackets to indicate the year and the sequential number of the cyclone. Since this practice was not according to the Annex 3 format for TC advisories the meeting advised that TCAC Tokyo should use only the name of the TC cyclone. The member from Japan took note of the discussion for corrective action by TCAC Tokyo.

10.27 The second issue related to the use of the TC names was the implementation of the requirement in p. 7.2.10 of Annex 3 regarding the issuance of SIGMET for tropical cyclones expected to affect the FIR up to 12 hour before the actual occurrence. It was recognized that this provision assumed the issuance of advisories by the TCACs at the stage of tropical depression (before the surface wind reaches 34 kt), i.e., before the tropical cyclone was given a name by the corresponding Regional Specialized Meteorological Centre (RSMC) that was also a TCAC. The meeting was advised that TCAC Tokyo did issue such advisories, indicating by the abbreviation “TD” in the TC name field that it was still a tropical depression. The representative of IATA advised that from the user point of view this was an acceptable practice and that it was desirable to amend the current Annex 3 provisions in this regard.

10.28 The meeting agreed that the provision for using the TC name in Annex 3 format of tropical cyclone should be addressed by ICAO in line of the above discussion. The meeting recalled also some feed-back from States regarding the provision of TC advisories and warnings calling for certain improvements, like inclusion of a +6 hour forecast of the TC centre in the TC advisory, introduction of a RMK section, etc. Noting the need for a review of these proposals and subsequent amendments of the provisions related to the TC advisories and warnings, the meeting formulated a Draft Conclusion as follows:

Draft Conclusion 7-10/34 – Further development of the ICAO provisions for the tropical cyclone advisories and SIGMETs

That, ICAO be invited to consider further development of the Annex 3 provisions related to the format and content of the tropical cyclone advisories issued by the Tropical Cyclone Advisory Centres (TCAC) and SIGMETs for tropical cyclones issued by the meteorological watch offices (MWO).

Agenda Item 11: Quality assurance in the MET field

Current status

11.1 The meeting recalled that Amendment 72 to ICAO Annex 3 contained a new recommendation in respect to the establishment and implementation of a quality system for the meteorological services provided to the international air navigation. The expert from Hong Kong, China presented the experience of the Hong Kong Observatory (HKO) in the implementation of the ISO 9000 quality management system (QMS) for its weather service in support of international air navigation. The process leading to ISO 9000 certification started in 2001 and could be roughly divided into 6 steps: training and appointment of management representatives, establishment of quality documentation, implementation of the quality system, commissioning of certification body, internal audits, and certification audits. The meeting noted that, since many of QMS components were already in place prior to implementation, the QMS quickly gained the full understanding and commitment of all HKO staff. This enabled the whole ISO certification process to be completed within the course of one year. The cost involved, including consultancy, certification and future maintenance cost, was considered acceptable.

11.2 The expert from Malaysia informed the meeting that the Malaysian Meteorological Service was in the process of migrating to the national equivalent of ISO 9001:2000 certification for its aviation weather service. The expert from United States stated that the implementation of ISO 9000 for its aviation weather service would be particularly expensive and the United States authorities were in the process of development of a QMS, which was not based on the ISO 9000 standards. The observer from WMO informed the meeting that the issue of QMS had been widely discussed within WMO. While for the aviation weather services the provisions recommending the use of ISO 9000 standards were already in place in the ICAO Annex 3/WMO Technical Regulations (C.3.1) the discussion on the type of QMS for the non-aviation weather services continued. The WMO Congress had recently agreed to set up a body to look into the issue with a view to develop a WMO specific quality system for weather services. The importance of having a QMS for aviation weather service was stressed by the expert from New Zealand who was of the view that ISO 9000 was considered a good starting point but not the only means of achieving QMS. The meeting recognized that different approaches and options to establishment of the QMS were being reviewed in the States. It was recalled that the issue was discussed also at the MET Divisional Meeting (2002) and that the need for further guidance was recognized by this meeting. The MET Divisional Meeting formulated recommendation 4/3 in this regard, calling that ICAO and WMO develop joint guidance material to assist State/Members in the development of QMS for the provision of meteorological service for the international air navigation.

Quality assurance seminar

11.3 The meeting recalled the APANPIRG Conclusion 13/32, inviting ICAO to organize, in coordination with the WMO, a seminar on the quality assurance in the provision of meteorological services to aviation in the ASIA/PAC Region in 2003. The meeting was informed that, during the review of the APNAPIRG/13 report by the ICAO Council this conclusion was addressed to WMO, in accordance with the working arrangements between ICAO and WMO. The meeting was further informed that in April 2003 the Secretary General of ICAO sent a letter to the Secretary General of the WMO inviting the WMO to arrange, in coordination with ICAO, the said training seminar. The observer from WMO advised that WMO was considering ways to organize such a training event. Notwithstanding the budgetary constraints, due to the fact that the WMO was close to the end of its 4-annual budgetary period, it was possible that funds might be available for supporting the training seminar, tentatively scheduled for November 2003. The meeting noted that Hong, Kong, China had kindly offered to host this seminar. The meeting considered the next steps for organizing the training seminar and agreed to set up an ad-hoc team composing experts from Hong Kong, China, Malaysia,

New Zealand, Singapore, USA, and WMO to draw up a tentative programme for the seminar, subject to confirmation from WMO.

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

Arrangement of the TAF responsibilities in the new Auckland Oceanic FIR

12.1 The expert from New Zealand informed the meeting of the current situation in the provision of aerodrome forecasts within the new Auckland Oceanic FIR after the change of the FIR boundary in 2001. It was explained that according to the FASID amendment proposal the responsibility for the issuance of TAF for two Pacific States – Tonga and Samoa, and American Samoa, now rested with Wellington. However, the Fiji Meteorological Service has agreed with the New Zealand CAA to continue with the provision of TAF for the Pacific Island States within the Auckland Oceanic FIR for the time being. Similarly TAF for American Samoa are continuing to be provided by the USA NWS in Honolulu. This meteorological service supply arrangement within the Auckland Oceanic FIR had not, as far as the expert from New Zealand could ascertain, been formally agreed between the States concerned, however, the current regime appears to be working reasonably well. In addition, the expert from Tonga informed the meeting that Tonga had set a plan for establishment of a forecasting office and that it was expected to start issuance of TAF for Tonga in 2004. The meeting felt that the situation with the provision of MET services in this part of the Pacific after the change of the boundary of the new Auckland Oceanic FIR needed clarification of the responsibilities and that ICAO, after collecting additional information with the assistance of New Zealand would advise on the action to be taken in this respect.

Weather sensing instrumentation at the Hong Kong International Airport

12.2 The expert from Hong Kong, China informed the meeting of the recent installation of a Doppler Light Detection And Ranging (LIDAR) system and six forward scatter meters at the Hong Kong International Airport. A presentation on the use of the LIDAR for windshear detection was presented. The LIDAR has been very helpful in particular in rain-free weather conditions, enabling the weather forecaster to issue timely windshear alerts. The new forward scatter meters have been providing readings that were found to correlate well with transmissometer observations. Also, they generally gave more precise visibility readings than human observations, especially in the night hours.

Development of new MET products in Japan

12.3 The expert from Japan presented to the meeting the plans of Japan to establish a new ATM Center in 2005, which would be the centralized operational center for ATM services in Japan. In order to support ATM operations, the Japan Meteorological Agency (JMA) was planning to set up a meteorological office in the ATM Center. The planned meteorological office would provide real time face-to-face briefings and specialized products for the ATM operations in Japan. In this regard, the JMA was now making every effort to develop specialized products to meet the ATM requirements. It was recognized that the present forecast products, such as TAF, were not always sufficient for supporting the ATM requirements.

12.4 One of the planned new products by Japan was a sequential graphical aerodrome forecast in the form of a time series for the meteorological variables having aviation impact. This product would be created by a forecaster, who would modify, as necessary, the first guess values of forecast guidance derived from a meso-scale numerical prediction model. Another new product was a thunderstorm nowcasting in the terminal area, based on extrapolation of existing thunderstorm cells detected by a radar and a lightning detection network. In addition, the expert from Japan informed of the development by the JMA of a new graphical route forecasts in the form of a vertical cross-section along an air route. The meteorological data for the vertical cross-section were derived from the global numerical model of the JMA. The initial reaction from pilots, to whom this experimental product had been distributed, was favorable.

12.5 The presentation of the above information by Japan was ensued by a lively discussion on the development of similar products by other States in the region. The expert from United States informed of the development of new meteorological products and procedures for meteorological support to the terminal operations and flow management, which has been carried by FAA in the recent years. One particular difficulty in the communication with the ATM and other users was to explain the uncertainties inherent to the meteorological information. It was felt that the introduction of probabilistic forecasts in the flight management decision supporting system would be beneficial. The expert from Hong Kong, China informed of the experience with the provision of windshear alerting services and highlighted importance of mutual understanding of requirements and capabilities between all relevant stakeholders. Experts from other States shared these views and informed on similar developments in their States.

12.6 The representative of WMO noted that explaining the limitations of the meteorological products to the different users was a difficulty experienced by many States in all Regions. He recalled that in order to enhance the dialogue and the mutual understanding of the needs for and limitations of the MET information for the ATS, a number of MET/ATS coordination seminars were carried out in different regions. These seminars were organized by ICAO in coordination with WMO. The meeting agreed that a MET/ATM coordination seminar would be a very good opportunity for information exchange between the MET and ATM experts from the ASIA/PAC States in the development of ATM-oriented services and products. The issue was further discussed under Agenda Item 13, and a draft conclusion formulated, calling for the organization of MET/ATM coordination seminar (Draft Conclusion 7-10/37 refers).

Agenda Item 13: Review developments, research, trial and demonstration relating to CNS/ATM

FANS Action Team for the Bay of Bengal (FAT-BOB) and for the Western Pacific/South China Sea (FAT-SEA)

13.1 The meeting recalled that during the ATS/AIS/SAR/SG/12 meeting, which was held in Bangkok, Thailand, 24 – 28 June 2002, a Working Group was appointed to consider how best to progress the implementation of key priorities for CNS/ATM within the region.

13.2 The Working Group subsequently advised ATS/AIS/SAR/SG/12 that the most effective way to progress CNS/ATM implementation in the areas where it was currently being implemented on a coordinated basis, was to reconvene the FANS Action Team – Bay of Bengal (FAT-BOB), and establish a similar group for the Western Pacific/South China Sea (FAT-SEA), which would also assist this area of operation where HF communications are presently being used.

13.3 The meeting noted that APANPIRG/13 formed the opinion that there was a need for overall coordination with those parts of the region that were currently not harmonized with the requirements of users and the plans of adjoining States, and that the implementation effort in these areas needed to be revitalized. It was recognized that there were significant economic, environmental and operational benefits to be realized from this coordinated approach.

13.4 Accordingly, APANPIRG/13 formulated the following Conclusion:

Conclusion 13/47 – Key Priorities for CNS/ATM Implementation

That, in order to facilitate the implementation of the Key Priorities for CNS/ATM in the ASIA/PAC Region, ICAO is requested to:

- a) re-convene the FANS Action Team for the Bay of Bengal (FAT-BOB), and form a similar group for the Western Pacific/South China Sea; and,
- b) adopt the broad terms of reference for these groups as follows:
 - i. identify elements of the key CNS/ATM priorities which have not been implemented on a coordinated basis;
 - ii. consider the implementation of these elements, on a prioritized basis, taking into account user operational requirements, cost-benefit and environmental concerns; and,
 - iii. develop action plans for CNS/ATM implementation as appropriate on a collaborative basis.

The Air Navigation Commission and the Council reviewed the APANPIRG/13 Report (30 January 2003 and 19 February 2003 respectively) and took the following action in relation to Conclusion 13/47:

“Noted the conclusion and that the FANS action team has been reconvened to develop an action plan so as to identify and implement the elements of the key CNS/ATM priorities which have not been implemented on a coordinated basis”.

13.5 The ICAO Asia and Pacific Regional Office followed up on the APANPIRG initiative and commenced planning on the basis that FAT-BOB would report to the Bay of Bengal ATS Coordination Group (BBACG), and that FAT-SEA would report to the South-East Asia ATS Co-ordination Group (SEACG). A similar arrangement currently exists in the Pacific, where the FIT reports direct to the respective IPACG or ISPACG meeting.

13.6 FAT-BOB and BBACG have been scheduled to be held on 8-12 September 2003 at Bangkok. The inaugural meeting of the FAT-SEA will be held in conjunction with the next SEACG meeting tentatively scheduled from 8 to 12 December 2003 at Bangkok.

13.7 The meeting noted that the proposed reactivation of FAT-BOB was considered essential to alleviate the problems presently encountered over the Bay of Bengal due to poor HF air/ground communications. The meeting was also advised that all FIRs with Bay of Bengal responsibility have CNS/ATM workstations. Procedures to use these facilities for Trials and Demonstrations were required to be developed by all responsible parties concerned to overcome the HF problem and provide an alternative means to ensure more reliable communications.

13.8 Both FAT-BOB and FAT-SEA would be expected to coordinate their activities with the proposed new Regional Airspace Safety Monitoring Advisory Sub-group (RASMA/SG), in addition to reporting to the BBACG and SEACG respectively.

Controller-Pilot Data Link Communications (CPDLC)

13.9 The United States provided the meeting with information on CPDLC Build 1, which was the system designed for domestic operations in continental United States. It was implemented at the Miami Air Route Traffic Control Center (ARTCC) in October 2002 and provided four operational services:

- a) transfer of communications;
- b) initial contact;
- c) altimeter setting; and
- d) menu text.

13.10 The meeting noted that CPDLC Build 1 phase had only one ARTCC deployed. It was planned to expand to eight ARTCCs CPDLC with Build 1A by expanding the CPDLC operation to seven additional ARTCCs and upgrading the CPDLC equipment at the Miami ARTCC. This also included five additional services; altitude, speed and heading assignment, route clearance and pilot initiated downlink altitude request message sets. The maximum number of CPDLC equipped aircraft per ARTCC in operation at any time was estimated initially to be 200 in the 2005-2008 time frame and 400 for 2009 and beyond. Build 1A implementation was to occur in the 2004-2006 timeframe with all eight ARTCCs having CPDLC operations by the end of 2006.

13.11 At the present time the CPDLC programme, Build 1A and beyond, had unfortunately been suspended indefinitely. Although there had been promising results, the current budget constraints within the FAA, the events of September 11, 2001, and the economic challenges facing aviation were factors which made this decision necessary.

13.12 With regard to implementation of ADS/CPDLC in oceanic areas within the area of responsibility of the United States, The meeting was advised that ATOP Build 1 Ocean 21 Auto System was being integrated into the New York and Oakland ACCs. An enhanced Build 2 Ocean 21 Auto System had been developed for Anchorage ACC, which provides radar data processing capabilities for use in radar transition airspace as well as enhancements required to support separation reductions in Pacific airspace down to 30NM lateral and longitudinal. Once this system was

operational at the Anchorage ACC, both New York and Oakland would be retro-fitted with the enhanced Build 2 Ocean 21 giving equivalent capabilities to Anchorage.

13.13 The meeting noted the work of the United States in regard to ADS/CPDLC both for their domestic as well as their oceanic operations. It should be noted that Oakland ACC had complete coverage of all oceanic routes.

South Pacific Fans Interoperability Team Report 2003

13.14 The meeting noted that the success of the South Pacific (SOPAC) FIT during its first five years of operation had led to the formation of similar groups that monitor FANS operations in other regions. Currently there were three other groups covering the Central and North Pacific, North Atlantic, and the Bay of Bengal. There was also some discussion about establishing another group to coordinate FANS implementation in the Polar Region.

13.15 Boeing continues to act as the Central Reporting Agency (CRA) for the SOPAC FIT and had begun to fill the role of CRA Support Agency (CRASA) for the FAA element of the IPACG FIT. The CRA receives problem reports from stakeholders and coordinates problem report resolution with the respective FIT. The CRA also processes monthly system performance data. The Japan Civil Aviation Bureau (JCAB) has established a similar CRA function for aircraft flying in the Tokyo and Naha FIRs; its supporting CRASA liaises closely with CRASA personnel at Boeing.

13.16 In the South Pacific Region, four of the five air traffic service providers (ATSP) had fully commissioned FANS controller workstations offering CPDLC, ADS, and ATC Inter-Facility Ground/Ground Data Communications (AIDC) services. The fifth ATSP was currently in the process of upgrading its existing workstations to include ADS capability.

13.17 Operational problems (i.e., due to controllers or pilots failing to follow procedures) and technical problems (i.e., due to hardware or software faults) continue to be reported in the SOPAC FIRs. Overall, the number of problem reports received had decreased. End-to-end system performance was high and relatively stable, and monitoring continues.

13.18 The user-preferred route (UPR) trials had been completed and UPRs were now a normal facet of regional operations. Significant operating benefits had been realized by the participating airlines since UPRs were first introduced.

13.19 UPR procedures allow airlines to optimize flight plans according to their own unique operating parameters for the type of aircraft, weight, and forecast weather at the time of departure. On long-haul flights, which were typically payload limited, use of UPR procedures enable Airlines to carry additional payload, which generates additional revenue on each flight.

13.20 The SOPAC FIT continues to work on reduction of separation minima based on overall system performance and FANS equipage. CPDLC provides the communications enhancements necessary for the implementation of 50 NM lateral separation in areas of convective weather activity. As other FIRs achieve full FANS functionality, FANS functions would allow a reduction of longitudinal separation to 50 NM throughout the South Pacific. Further reductions in both lateral and longitudinal separation minima to 30 NM remain a final goal for the team.

13.21 The meeting noted the work of the South Pacific FIT.

New Zealand ATM System Implementation

13.22 The meeting was advised that the New Zealand air navigation service provider, Airways New Zealand established a project in early 2000 to renew its domestic air traffic management system. The chosen system needed to support not only the current capacity, performance and functional requirements but also predicted growth over the next 10 years and had the ability to implement any required CNS/ATM concepts.

13.23 The initial system needed to provide services to 3 major International Towers, 14 Regional Towers and 3 En-route Centres; this encompasses 39 radar positions. The SkyLine system, supplied by Lockheed Martin ATM, provided a feature-rich, high availability, distributed and modular architecture as well as a seamless expansion capability. Following an extensive specification phase a number of enhancements were detailed for development; many of these were country unique features. This development work was undertaken jointly between Airways and Lockheed Martin ATM.

13.24 The meeting noted that the system went through a rigorous factory acceptance test, and site acceptance and system stability testing. In parallel to this integration and testing work Airways developed a thorough and robust conversion-training programme. This included computer-based training modules that ranged from assisting controllers unfamiliar with a computer windows-type environment to complete simulated radar training exercises.

13.25 Transition to the SkyLine system was planned to occur in three phases over a four month period during which time the new and old systems would need to operate seamlessly together; with messages between the two being exchanged using AIDC. The first two phases of the transition had been completed successfully, with the third, and last, transition expected to be completed in early September 2003.

13.26 The domestic SkyLine system had been successfully integrated with New Zealand's Oceanic system and the existing domestic system (Aircat) via AIDC. It was integrated with the AFTN and provides an automated data feed to the aviation billing system, as well as providing information to two international airports in connection with their noise monitoring activities, and to an Internet flight-tracking system.

13.27 The implementation of the new domestic SkyLine ATM system was a significant success which ran to schedule and budget. This system provides the platform to implement other CNS/ATM features such as CPDLC, ADS-B, ATN, PDC, etc when operationally required.

13.28 The meeting noted the work that had been accomplished by New Zealand.

Future development of Air Traffic Control systems in Hong Kong, China

13.29 The meeting was advised that, with more than 4 years operational experience at the new Hong Kong International Airport, it was recognized that the Hong Kong air traffic control systems would need to be enhanced so as to expand the systems capabilities, functionalities and human-machine interface. This was considered important to ensure that the systems continue to be able to effectively handle the anticipated increase in density and complexity of air traffic movements in Hong Kong as well as the Pearl River Delta region.

13.30 In line with the ICAO global and regional implementation plans for CNS/ATM systems, the Civil Aviation Department (CAD) of Hong Kong, China decided to continue with the study and trial phases of CNS/ATM implementation and to plan, evaluate and analyze the characteristics, functionalities and capabilities of different but inter-related elements as applicable to

the unique operational environments of Hong Kong, China. Particular attention had been paid to the density of air traffic, hilly terrain and vast airspace over water within the Hong Kong area of responsibility.

13.31 For those systems that had proved to offer additional operational and safety benefits, CAD intends to put these systems into operational use after acquiring sufficient trial experience and agreement from the Hong Kong CNS/ATM Committee, which had been set up to discuss and coordinate issues relating to the study, trial and implementation of the CNS/ATM Systems for Hong Kong, China. This committee consists of members from IATA, IFALPA, Cathay Pacific Airways, Hong Kong Air Traffic Control Association, Hong Kong Observatory, telecommunications service providers etc.

13.32 Several major and critical systems either had been upgraded or would be replaced at an overall costs of US\$ 17M. The current status is:-

- (a) enhancement of Automatic Message Switching System (AMSS) – completed in May 2002;
- (b) speech Processing Equipment (SPE) Enhancement – completed in December 2002;
- (c) Aeronautical Information Database System (AIDB) Enhancement – completed in January 2003;
- (d) enhancement of Radar Data Processing and Display System/Flight Data Processing System/Simulator (RDPDS/FDPS/SIM) – completed in March 2003; and
- (e) replacement Route Surveillance Radar (RSR) – Factory Acceptance Test completed, with equipment now being delivered to Hong Kong in phases and expected to be commissioned in end-December 2003.

13.33 To enhance the radar coverage within the Hong Kong FIR, action had been taken with the Air Traffic Management Bureau (ATMB) of CAAC to exchange SSR data between Hong Kong and Sanya, with the work completed in October 2001.

13.34 So far, trials had been conducted by Hong Kong, China on the following CNS/ATM system elements:-

- (a) Datalink ATIS (D-ATIS) and Datalink VOLMET (D-VOLMET);
- (b) ADS/CPDLC – trials have been conducted with aircraft of different categories, i.e. B747, B777, A330 and A340, to test the compatibility of FANS-1/A equipage. Besides, downlink of meteorological data on outside temperature, wind speed and wind direction from the aircraft for direct connection with and processing by the meteorological computer systems has also been trialed;
- (c) Pre-Departure Clearance (PDC) delivery via data-link;
- (d) Air Traffic Services Message Handling System (AMHS) – trials have been or are being conducted with Thailand, Japan, Australia, Singapore and the Mainland China. A special tripartite ATN trial between Beijing, Bangkok

and Hong Kong was made in September and October 2002. Further ATN trial with Bangkok using 64,000 bps high speed circuit is on-going. Moreover, CAD has commenced preliminary trials with Hong Kong Observatory and local airlines on the use of ATN/AMHS for real time ground-ground delivery of MET data;

- (e) VHF Digital Link (VDL) Mode 2 data integrity and coverage checks at the Hong Kong International Airport;
- (f) GNSS En-route applications;
- (g) SATCOM;
- (h) AIDC – trial was recently conducted with Guangzhou. Trial with Sanya commenced on 14 July 2003; and
- (i) ATM – for functions including Minimum Safe Altitude Warning (MSAW), Conflict Alerts for both Approach and En-route, and Flow Control Management.

13.35 During the various trials, problems on interoperability and incompatibility had been identified. Through co-operation and support by the airlines, neighbouring ATC authorities, equipment suppliers and telecommunications service providers, the parties concerned managed to overcome the problems within a short period of time. The experience gained help assist Hong Kong, China to establish the operational and engineering requirements, system configuration and implementation programme for a particular CNS/ATM element.

13.36 With various enhancements made to the ATC systems, the runway movement rate at Hong Kong International Airport had been increased in phases from 31 movements per hour when the new Airport opened, to the present 49 movements per hour. There exists room for further increase in runway movement rate.

Future Plan

13.37 The existing DVOR/DME on Tung Lung Island had been used for more than 15 years and needs to be replaced by 2006. Tender invitation was expected in the end of 2004.

13.38 To provide a complete radar/VHF communication coverage within the Hong Kong FIR, discussions had been made with ATMB of CAAC regarding the sharing of the SSR and VHF communication facilities to be installed in the South China Sea for use by Hong Kong ATC. Should things go smoothly, the facilities could be made available by end 2003. Thereafter, the whole Hong Kong FIR would be completely covered by SSR and VHF communications, thus helping to streamline the ATC operational workflow and achieve further enhancements on safety and airspace capacity.

13.39 Hong Kong, China would continue to pursue actively with the trials on various CNS/ATM system components, taking into account the potential operational/safety benefits, and their maturity and availability in the industry. The major activities planned for the next few years include:

- a) Surface Movement Guidance and Control System (SMGCS) trial for the provision of identification of moving targets (aircraft and vehicles) on the airfield and runway intrusion alert. The tender invitation exercise for the trial service is on-going and the contract is expected to be awarded in August 2003;

- b) VHF Data-link Mode 2 trial under multi-user scenario;
- c) SSR Mode S trial – particular emphasis will be placed on the Mode S data-link applications for downlink of meteorological data from the aircraft;
- d) Implementation of ground-to-ground ATN Network with adjacent ATS authorities and conduct further ATN and AMHS trials, including trials with Manila, Hochiminh, Taibei and Macao;
- e) Further AIDC trials with Taibei; and
- f) ADS-B trials.

13.40 For ATM, trials on electronic flight strips (EFS) will be made initially for Tower operations. Also, trials on Arrival Metering and Sequencing had been planned.

13.41 The meeting noted the work in progress by Hong Kong China.

Modernization Project of Area Control System in the Republic of Korea

13.42 The Republic of Korea presented information on the new Incheon Area Control Center (ACC) which was responsible for 430,000 square kilometers of airspace in the Incheon FIR providing service to a daily average of one thousand aircraft flying in the FIR.

13.43 A modernization of the area control system with state-of-the-art technology was completed in November 2001, leading to increased capacity and enhanced control system that would ensure safe and expedient operation of aircraft in the 21st century. The need for modernization of the ACC arose as the system that had been in place reached its limitations for further expansion or improvement. Modernization was also required to meet the demands of increasing traffic and to provide high-quality air traffic service.

13.44 The ACC modernization project was started in May 1995 and completed in October 2001. A total of 61.1 billion won was invested in the project, which included the installation of a new air traffic control system and construction of buildings. Installation of new equipment was completed in May 2001. The new system underwent a transition period from August to September during which both new and old systems were operated. After the final operation trial that took place near the end of September, the new system was officially established as the operating system on 17 October 2001. No deficiencies in the new operation were found during the transition period.

13.45 The new area control system receives aircraft detection information from eleven radars that enables two or three-fold surveillance of Incheon FIR. It has also adopted the triple system redundancy for non-interrupted operation.

13.46 As a result of the modernization project, capacity had been significantly increased compared to the previous system, for example:

- a) air traffic control sectors from 6 to 12 sectors;
- b) concurrent track processing capability from 300 to 1,000 aircraft;
- c) simultaneous flight plan processing capability from 340 to 4,000 aircraft; and
- d) repetitive flight plan processing capability from 1,000 to 20,000 aircraft.

13.47 The meeting noted the improvements that had been made by the Republic of Korea to its air traffic management system.

CNS/ATM Implementation Planning Matrix

13.48 The meeting reviewed the CNS/ATM Implementation Planning Matrix. The Matrix contains the implementation status of CNS elements such as ATN, AIDC, CPDLC, GNSS and ADS. The Matrix was expected to be reviewed by APANPIRG and its Sub-Groups on a regular basis to assess progress of implementation. The Matrix would be further developed progressively to include implementation status of major CNS/ATM elements covering all ASIA/PAC FIRs. The updated Matrix is provided in Appendix W to the report on Agenda Item 13.

MET component of CNS/ATM

13.49 The meeting was presented with a report from the member from Australia who was the chairman of METATM Task Force of the CNS/MET SG. The chairman of the task force emphasized that the meteorological information/products specified in Annex 3 in the majority of cases had been developed to cater for flight planning requirements. Traditionally, the ATM users had used these products which were adequate for a range of uses. In recent times however, the advancement of the ATM systems and procedures had generated demand for more user-focused meteorological information. This demand had been approached on a number of fronts and scales. On the global scale it was present in the development of the WAFS while at the local scale a wide range of meteorological information was being provided by States to satisfy the specific requirements of the ATM. The report concentrated on the meteorological service being provided by a number of States in the ASIA/PAC Region with respect to user requirement, content and systems. The report of the METATM TF is provided in Appendix X to the report.

13.50 The expert from Hong Kong, China presented information on the development of the meteorological systems in support of the new CNS/ATM systems by the Hong Kong Observatory during the past year in the following areas:

- (i) downlink of meteorological data from aircraft;
- (ii) a trial on real-time retrieval of weather information from an HKO database via the ground-to-ground ATN/ATS Message Handling System (AMHS); and
- (iii) new weather services in support of ATM.

In particular, the application of the mode-S data link specified in ICAO Manual on Mode S Specific Services (Doc 9688) in automatic air-reporting, which would not incur ACARS communication cost, appeared to be an attractive alternative to ADS, especially for the ascent/descent phases of the flight. The meeting noted that if a particular airspace was already under the coverage of surveillance radars, ADS might not be used for aircraft surveillance and thus no automatic air-reports would be available from the airspace concerned. While the weather reporting function had been specified for the mode-S data link, it had not been implemented in the onboard mode-S transponder software. Furthermore, the transponder supplier indicated no plan to implement the weather reporting function due to the lack of requirements from airlines. The meeting discussed this issue in detail and noted that the availability of some 50,000 automatic air-reports in the United States had demonstrated to have significant value to improvement of numerical weather prediction for aviation weather forecast. On the other hand, at present only one State in the ASIA/PAC Region was able to receive automatic air-reports through ADS. Considering the above, the meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/35 – Application of Mode-S datalink in automatic weather reporting

That, ICAO be invited to consider the application of the Mode-S datalink in automatic air-reporting as an alternative to ADS over areas covered by

surveillance radars and to consider ways to facilitate its implementation in the ASIA/PAC Region.

D-VOLMET

13.51 The meeting was informed of the D-VOLMET service implemented by Hong Kong, China in April 2001, in parallel with the VOLMET radio voice broadcast service. The D-VOLMET messages provided the same OPMET information as in the VOLMET broadcast and were updated immediately when new information was available. Aircraft equipped with the appropriate ACARS hardware and software could retrieve the D-VOLMET messages via datalink service provider who served as the data transporter. The meeting noted the benefits of the D-VOLMET service to aircraft, including reduced workload for pilots, removal of errors due to reception/transcription, retrieval at will by pilots, quick access to latest weather information including the SIGMET, and improved area coverage.

MTSAT

13.52 The expert from Japan presented the latest schedule of the launch and commissions of the functions of the Multi-functional Transport Satellite (MTSAT) project to the meeting. In particular, it was noted that the launch of the MTSAT had been re-scheduled for early 2004 and the meteorological functions would be operational in spring 2004.

Future Work Programme of the METATM TF

13.53 The report by the Chairman of the METATM TF on the tasks accomplished and recommendations of the METATM TF on the future tasks to be undertaken is included in Appendix X to the report. This report provided some initial guidance to the States on the development of tailor-made products to support the ATM. The meeting felt that the work on the MET component of the CNS/ATM system should continue involving experts from both MAT and ATM fields. It was agreed in this regard, that the METATM Task Force of CNS/MET SG should continue its work and that the terms of reference of the task force should be updated to reflect the discussion of this meeting. The meeting formulated the following Decision:

Decision 7-10/36 – ASIA/PAC METATM Task Force

That, the TORs of the METATM TF be amended as given in Appendix Y to this report.

The METATM TF is composed by experts from: Australia, Hong Kong, China, Japan, United States and IATA. Mr. Ted Williams, expert from Australia will continue to serve as Rapporteur of the Task Force. It was recommended that the States should be encouraged to nominate both MET and ATM experts to join the task force.

13.54 The meeting further recognized the importance of the exchange of information between the MET and ATM communities in order to enhance the awareness of the requirements for MET support to the ATM and the current and future capabilities of the meteorological information and services. Such exchange would foster the mutual understanding between the two communities and facilitate further development of the MET component of the new CNS/ATM systems in the ASIA/PAC Region. In noting this, the meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/37 – Fostering of exchanges between MET and ATM

That,

- a) the MET Authorities/Providers of the States, be encouraged to continually assess with the corresponding ATM authorities the requirements for MET information with the aim of developing new products/information to support the ATM, bearing in mind the potential costs and benefits involved; and
- b) ICAO be invited, in coordination with WMO, to organize a MET/ATM coordination seminar in ASIA/PAC Region in 2004, to foster the exchanges between the MET and ATM experts in order to facilitate further development of the MET component of the CNS/ATM systems in the ASIA/PAC Region.

Agenda Item 14: Review and identify key priorities in the CNS/ATM implementation

Airspace user perspective on CNS/ATM services in the Asia Pacific Region

14.1 IATA presented an outline of the history of the development of the CNS/ATM system from the establishment by the ICAO Council establishing the Special Committee on Future Air Navigation Systems (FANS) in 1983 to study, identify and assess new technologies, including satellite technology, and to make recommendations for the future development of navigation systems for civil aviation, to the introduction of operational data link services using the FANS 1/A aircraft system.

14.2 The first operational CPDLC services using the FANS 1/A aircraft systems was introduced in the South Pacific in 1995. This effort was pioneered by ISPACG and its partners through data link trials in 1993, which resolved interoperability issues and led to development of a South Pacific Operations Manual (SPOM) for operating procedures for FANS 1/A aircraft.

14.3 Subsequent developments in the South Pacific had resulted in almost total coverage of the Pacific Ocean with CPDLC and ADS services to suitably equipped aircraft. This enabled FANS 1/A equipped aircraft to experience significant benefits in flexible tracks between Australia/New Zealand and the United States, which resulted in considerable flight time and fuel savings per flight. However, elsewhere, the implementation of FANS had been a long and frustrating experience with millions of dollars invested on expectation of near term benefits. After a long period of development, ICAO separation standards for 30 NM lateral and longitudinal separation became available in November 2002. More effort needs to be made to implement these separation minima to take advantage of the significant benefits that could be realized.

14.4 Today, many airlines and States in the Asia Pacific region had invested in the FANS 1/A system. There were now in excess of 2000 FANS 1/A capable civil air transport aeroplanes in service. The US Military had committed to approximately 1400 FANS packages (over a period to 2016) and every A330, A340, A380, B767, B777 and B747 were equipped either FANS 1/A enabled or immediately available with a software change. In addition, there were a significant number of integrated or stand-alone FANS automation systems in place with the Asia/Pacific State ATS Providers. With such significant investment by States and users in FANS technology, regrettably, there was very little benefit being currently realised.

14.5 IATA would like to see more ICAO assistance in fostering the expansion of existing CNS/ATM capabilities within the region, particularly in the planning, trials and demonstrations of CPDLC, ADS and RNP 4. There was a region-wide requirement to coordinate and address the interoperability issues. IATA was pleased that APANPIRG and ICAO were addressing key priorities for CNS/ATM Implementation. Also, IATA supported the positive steps being taken by ICAO through ICAO's ADS-B Implementation Task Force and the decision to recommend Mode-S enhanced (1090-ES) as the regional link protocol for ADS-B.

14.6 IATA stressed that considering the economic recovery of the airline industry and the existing numbers of aircraft equipped with the FANS 1/A capability, it was of utmost importance that both providers and users start to realise the safety and economic benefits of FANS - the existing generation of CNS/ATM. IATA was concerned that the next generation of CNS/ATM may have little chance of gaining airline acceptance, if the benefits to presently equipped aircraft were not seen in the next few years.

14.7 The meeting noted IATA and its members' concerns over the pace of implementation of CNS/ATM systems that take advantage of FANS 1/A. It should be noted that these systems were not ICAO SARPs compliant, and there had been lengthy deliberations on how best to make use of these systems on a global basis, when the technology being used did not meet ICAO technical performance requirements for provision of air traffic control services. However, in spite of these early difficulties, and the need for many States to upgrade their ATM systems to a level that could support data link services, there had been notable progress in recent times. It had now been generally accepted that FANS 1/A aircraft systems and supporting technology were acceptable interim systems that should be utilized to the extent possible. Although SARPs were not being developed for FANS 1/A, ICAO had provided separation minima (30 and 50 NM) that were developed using FANS 1/A technical performance. Also, a major technical review of the Asia/Pacific Manual on CNS/ATM Operations, which was based on the SPOM, was carried out by ICAO to facilitate harmonizing this document with ICAO provisions.

14.8 The meeting was informed that the ATS/AIS/SAR/SG/13 had proposed to APANPIRG/14 that the Guidance Material be aligned with the ICAO review and harmonized with the Pacific Operations Manual (merged NPOM and SPOM). Also, the reconvening of the FAT-BOB and the establishment of FAT-SEA, would contribute to advancing implementation of data link services in the respective areas and enable further reductions in separation. IATA requested that a two week intensive ADS and CPDLC data collection be performed for the period 17 August to 30 August 2003 by the States concerned before the proposed September meeting of FAT-BOB. This would ensure that the meeting had up-to-date material and could start to evaluate technical performance issues. This would contribute to a more productive meeting.

14.9 The Secretariat advised the meeting that the invitation to participants would be circulated shortly and the initiation of a data collection by States as suggested by IATA would be included.

14.10 The meeting was advised that after successful implementation of data link following the FAT-BOB programme, there were other significant airspace management issues to resolve to remove ATS route restrictions, which impedes traffic flow on major inter-regional trunk routes Asia/Middle East /Europe. These include:

- a) implementing a planned EMARSSH ATS route over India;
- b) gaining an additional westbound flight level on another EMARSSH route;
- c) an urgent release of FL280 on N644 and N750 and A466 by the military authority responsible for the Kabul FIR;
- d) extension of RVSM through Afghanistan into southern Commonwealth of Independent States and onwards to the Black Sea or the Russian Federation;
and
- e) reduction of the longitudinal separation of 10 minutes in the Kabul FIR.

14.11 In regard to the airspace capacity limitation in the Kabul FIR and beyond, the meeting was advised by the Secretariat that introduction of FANS 1/A services in the Bay of Bengal may not achieve desired benefits and could exacerbate an already constrained ATC system which suffers from the problems mentioned above. However, there were substantial benefits to be gained from the implementation of FANS 1/A and associated ground systems for the Bay of Bengal area to operate data link services, and this should be progressed as a matter of priority.

14.12 The meeting recognized that to gain the optimum utilization of airspace, it was necessary to look at the big picture. This would require close coordination with adjacent States to harmonize and improve the ATM services across the regions concerned. As the main traffic flow from Asia/Middle East/Europe was not obtaining full benefits of the EMARSSH project due to restrictions imposed in several areas on this route structure, priority should be given to resolving these problems. In this regard the meeting agreed that an inter-regional coordination meeting involving the EUR/MID/ASIA concerned States as well as airline operators, ICAO Regional Offices and other interested parties to address these issues should be convened to ensure these matters were resolved. The meeting formulated the following Draft Conclusion:

Draft Conclusion 7-10/38 – Inter-regional ATS coordination meeting ASIA MID/EUR

That, as a matter of priority, an inter-regional ATS coordination meeting be convened to address improving the efficiency of operation on major trunk routes from Asia to the Middle East and Europe, taking into account:

- a) the constraints on ATM and airspace arrangements;
- b) further implementation of RVSM in FIRs serving these routes;
- c) military airspace restrictions on gaining access to routes and flight levels;
- d) full implementation of EMARSSH routes;
- e) cooperative and flexible flight planning by international airlines;
- and
- f) harmonization of application of ICAO separation provisions.

Key Priorities

14.13 While reviewing the information on the developments and activities relating to CNS/ATM system, the meeting identified the need to include implementation of Data Link Flight Information Services (DFIS) applications including D-ATIS, D-VOLMET and PDC into the list of key priorities in the CNS/ATM implementation based on benefits identified.

14.14 Following the discussion on proposed changes to the regional strategy for the GNSS implementation, the meeting recognized the need to update to the existing key priorities items and to add a new key priority regarding implementation of APV and RNP Approaches in the list of key priorities in the CNS/ATM implementation.

14.15 The meeting also recognized the need to include a new item of Safety Management System.

14.16 The meeting updated information in the Table of Key Priorities and identified new key priority items which are shown in Appendix Z. In view of the above, the meeting formulated the following Draft Decision.

Draft Decision 7-10/39 – Amendment to the key priorities for implementation of the CNS/ATM systems for the ASIA/PAC Region

That, the amended list of Key Priorities for implementation of the CNS/ATM systems for the ASIA/PAC Region provided in Appendix Z to the Report on Agenda Item 14 be adopted.

Agenda Item 15: Review and update the ASIA/PAC Regional Plan for the CNS/ATM systems

Review of the APAC Regional Plan for New CNS/ATM Systems

15.1 The meeting reviewed and updated the Asia Pacific Plan for New CNS/ATM Systems. The meeting noted that key aspects of the plan were focused on the nine major traffic flows, the ATM operational enhancements for en-route operations, associated required aircraft functions and ground services, and the ATM system transition time lines. The meeting recognized that a detailed review and updating of the tables could not be fully carried out at this meeting due to the limited time available, which had been constrained due to the combining of the two Sub-Group meetings. The information on the facilities and services required were also related to the ANP FASID, and there needed to be a correlation of the material in these documents. The meeting considered whether the tables still provided useful information and whether the annual review and update should continue.

15.2 In this regard, the meeting agreed that there was value in retaining the information but for the material to be of value, it needed to be kept up-to-date and this required time and resources to carry out the exercise, and States would need to bring to the meeting the necessary information. In this regard, it would be helpful if the Secretariat reminded States to update the tables prior to the meeting and to make the review material available on the Regional Office Website: <http://www.icao.int/apac>. Further, the meeting agreed to refer the matter for further consideration to the Task Force (Agenda Item 22 refers), as one of the tasks to be included in the work programme of the Sub-Group.

The Australian Air Traffic Management Strategic Planning Framework

15.3 Australia presented information on the Australian ATM Strategic Plan [hereafter referred to as ‘the Plan’], which was developed through a cooperative planning approach that involved a cross section of Government and aviation industry organizations that had a stake in the future of Australia’s ATM system.

15.4 The meeting was further advised that the need for the Plan grew both from the pragmatic recognition of the current ad-hoc nature of CNS implementation and ATM enhancement – both regionally and globally - and from a recognition of the potential significant benefits of a cooperative approach to future investments in ATM systems by airspace users (in terms of airborne equipment) and service providers (in terms of ground based infrastructure and systems). Furthermore, there was a growing appreciation that air traffic management covers all aircraft operations from the time a flight was planned through to time the aircraft parks at the destination airport – not simply that component currently managed by the Air Traffic Service Provider. The development of new air traffic management systems also had safety regulatory implications. Hence the need to engage broad representation from aircraft and airport operators and the aviation safety regulator in the strategic planning process.

15.5 As part of the ongoing process and the continued collaborative approach to planning, Australia had also developed a Target Operational Concept which describes an ideal future vision of ATM. It presents a concept of how this advanced system would operate in terms of operational practice, need and outcome, and attempts to remain independent of enabling technologies and applications. The future concept, in articulating an ideal, also represents a target towards which the current system would aspire, and forms a basis for the design and development of transitional strategies and migratory planning.

15.6 The Australian ATM stakeholders realized that no one single organization could give effect to the level of coordination required to achieve the “ideal future” of ATM. Instead, a “round table” of key stakeholders needed to be created, each participating on a “strategic partnership” basis, each understanding that their participation was purely in the interests of harmonization and effective use of available resource.

15.7 The meeting noted that it was important to understand that the steering committee was NOT a decision making body – rather, it was a body of decision makers. That is, the representatives empower ATM implementation by agreeing key strategies, and then facilitating the implementation of those strategies within their own organization. The success of the framework was critically dependent on highest level executive management commitment from all key stakeholders. The strategic management framework consists of:

- a) a strategic management process and methodology;
- b) senior representatives of ATM stakeholder organizations;
- c) an ATM Strategic Management Group to provide broad guidance, direction and coordinate resources for ATM strategic management activities; and,
- d) an ATM Strategic Planning Forum.

15.8 An effective strategic management framework would ensure there is:

- a) broad agreement by stakeholders on the major ATM service delivery issues including cost and charges;
- b) broad agreement on the investment priorities to address ATM capability gaps;
- c) development of sustainable safety and business cases to support optimum ATM investment decisions;
- d) simultaneous and integrated planning, development and implementation effort by all relevant ATM stakeholders, under agreed contractual arrangements, if required, to ensure the timely delivery of ATM improvements;
- e) collaboration and alignment on ATM strategic planning, financing and implementation within each stakeholder organisation; and,
- f) innovative ATM planning and implementation, consistent with a broad and on-going commitment to ICAO.

15.9 The ATM strategic management framework had been structured such that there was a core component of the key ATM stakeholders (the Australian ATM Strategic Management Group - ASTRA) and a support component that facilitates broader communications with other ATM stakeholders. ASTRA was responsible for the following:

- a) development of the Target ATM Operational Concept;
- b) identification and analysis of the gaps between the current system and the Target ATM Operational Concept to determine the required changes in ATM services and service levels;

- c) refinement of key ATM strategies;
- d) analysis of ATM strategies and the subsequent identification and development of ATM capability options for existing and future ATM services and support functions;
- e) management of the Australian ATM Strategic Plan, including regular review and update;
- f) development of proposals for major ATM investment and R&D projects, including project business cases;
- g) monitoring and reporting on the progress of ATM implementation projects;
- h) provision of specialist knowledge to ATM stakeholder executives and business centres, and project teams;
- i) initial identification of financial resource requirements for ATM project implementation;
- j) establishment of an ATM information network; and,
- k) facilitation of the Australian ATM Strategic Planning Forum.

15.10 The major benefit of adapting and adopting the ATM strategic management framework for the development of a regional ATM Strategic Plan, was that it would facilitate a systematic and collaborative approach by all ATM stakeholders to ATM planning and implementation within the region. The purpose of the ATM strategic management framework was to ensure that:

- a) there was simultaneous and integrated ATM planning, development and implementation effort by all relevant ATM stakeholders, under agreed contractual arrangements, if required, to ensure the timely delivery of ATM services and the achievement of ATM system goals;
- b) there was broad agreement on the ATM investment priorities to address ATM capability gaps;
- c) there was broad agreement by stakeholders on the major ATM service delivery issues, including cost and charges;
- d) sustainable safety and business cases were developed to support optimum ATM investment and implementation decisions;
- e) there was trans-business/trans-programme functional collaboration and alignment on ATM strategic planning, financing and implementation within each stakeholder organisation; and,
- f) ATM planning and implementation in the various Regions and States was innovative and consistent with their on-going commitment to ICAO.

15.11 The meeting thanked Australia for their in-depth and comprehensive presentation and suggested that this material may well be of particular interest to the APANPIRG/14 meeting as well as to the AN-Conf/11 meeting at ICAO Headquarters later this year.

Australia and Papua New Guinea ATM and GNSS projects

15.12 The meeting was updated by Australia on some of the ATM activities of Australia and Papua New Guinea on a number of ATM and GNSS projects that had taken place since CNS/ATM/IC/9 was held in March 2003.

15.13 The Australian Strategic ATM Group, (now known as ASTRA), consisting of the Australian industry, Airservices, the Civil Aviation Safety Authority, the Department of Transport and Regional Services and Defence, had continued their collaborative efforts in the development of a second version of the ATM Strategic Plan and its accompanying sub-plans which were expected to be formally launched in September 2003 and will be available on web site: www.astra.aero. More information on ASTRA is provided under Agenda Item 15.

15.14 The overall Plan, Volume III, includes the Communication, Navigation and Surveillance Plan, which contains the expected transition to GNSS based navigation as well as increasing the use of ADS-B for surveillance.

15.15 In recognition of the APANPIRG recommendation that new GNSS standards should be based on the FAA TSO C145/6 receiver standard, the ASTRA group was undertaking a research project to confirm the findings of previous theoretical studies and determine the operational issues associated with using this receiver to provide GNSS navigation in Australia domestic airspace. This study would include using a GPS simulator to test various fault and interference scenarios as well as flight-testing to examine human factor issues and operational use approvals. The study would also examine the operational use of the US SBAS signal from the WAAS, which was expected to be declared operational in July 2003.

15.16 An AusAID funded US DoT study in Papua New Guinea in 2001, recommended that the country transition domestic air transport operations to full GNSS using the TSO C145/6 receivers. Now that these receivers had been certified and were available, the PNG CAA, in conjunction with the industry, had decided to accept the DOT study findings. A project was being developed, with AusAID assistance, to move domestic IFR navigation in PNG to GNSS by 2006. Selected airports would retain conventional ground based aids including ILS and VOR/DME to support international operations.

15.17 The meeting noted that the ASTRA Plan provided information that could be incorporated along with other state plans into the Regional CNS/ATM Plan. The meeting agreed that this should be taken into account as a task of the CNS/ATM/IC/SG and included as an item to be reviewed by the proposed Sub-Group Task Force (Agenda Item 22 refers).

Agenda Item 16: Safety and security in Air Traffic Management

1) review Agenda Item 2 of AN-Conf/11

Status of Safe Flight 21

16.1 The United States gave a presentation on their Safe Flight 21 Programme, which was a cooperative government/industry programme to evaluate capabilities to improve aviation safety, efficiency, and capacity. This programme was conceived in 1998 and addresses the CNS issues and provide information to the FAA and industry so that they could make decisions about implementing these systems.

16.2 It focused on a manageable set of operational capabilities that were important to the user community. These include the cockpit display of traffic, weather, and terrain information, improved information for controllers, and improved surface situational awareness. The new technologies were based on the use of GPS, ADS-B, Traffic Information Service-Broadcast (TIS-B), Flight Information Services-Broadcast (FIS-B), and the use of a multi-functional display in the cockpit and enhanced controller displays.

16.3 The objectives of Safe Flight 21 was to identify, evaluate, and mitigate the risks associated with the selection, implementation, and integration of planned CNS capabilities and corresponding procedures. In mitigating these risks, the programme would:

- a) Enhance safety;
- b) Increase system capacity and efficiency;
- c) Maximize user operational benefits;
- d) Minimize user equipment costs and FAA operational costs;
- e) Address pilot and controller human factors issues;
- f) Develop and assess new operational procedures and associated training;
- g) Streamline certification processes and procedures;
- h) Develop a cost-effective avionics and National Airspace System (NAS) infrastructure; and,
- i) Define a realistic NAS transition path supported by the user community.

16.4 The Safe Flight 21 Programme operational enhancements were identified by the operational users through RTCA. The operational enhancements were as follows:

- a) Provides weather and other information to the cockpit;
- b) Affordable means to reduce controlled flight into terrain;
- c) Improved capability for approaches in low visibility conditions;
- d) Enhanced capability to see and avoid adjacent traffic;
- e) Enhanced capability to delegate aircraft separation authority to the pilot;
- f) Improved capability for pilots to navigate airport taxiways;
- g) Enhanced capability for controllers to manage aircraft and vehicular traffic on airport surface;
- h) Provides surveillance coverage in non-radar airspace; and,
- i) Establish ADS-B separation standards.

16.5 Each of these operational enhancements was further defined to the meeting in terms of operational applications.

Demonstration and Evaluation

16.6 Safe Flight 21 demonstrates and evaluates the benefits of the applications. Prior to committing the FAA and the users to a full-scale implementation of these enhancements, there would be a consensus of the feasibility and business case for the enhancements among the stakeholders. The FAA and industry would jointly define, develop, and evaluate the enhancements.

16.7 The Safe Flight 21 Programme Office would demonstrate and evaluate the benefits of this new technology. This would include operational and procedural issues, as well as cost/benefit matters. The review of operations and procedures would ensure that pilot, controller, operator, FAA air traffic maintenance, and flight standards issues were addressed. The cost/benefit activity would define the cost of the data link and quantify and qualify the economic and safety benefits derived from each capability.

16.8 In 2000, the Safe Flight 21 programme conducted an Operational Evaluation in Louisville, Kentucky to demonstrate the efficiency and safety benefits of using ADS-B and to evaluate air traffic controller use of ADS-B in the terminal area environment. In addition, tests were conducted to develop and evaluate avionics and procedural modifications to improve the following applications: departure spacing, approach spacing, runway and final approach occupancy awareness, and airport surface situational awareness.

16.9 In 2001, the Safe Flight 21 programme 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.

16.10 In 2002, the multilateration system was installed at Louisville, Kentucky, and a new automation platform for that facility to support on-going ADS-B test and evaluation efforts was procured. Development and evaluation continued on avionics and the procedural modifications needed to improve surface situational awareness to enhance existing surface surveillance using ADS-B. Interoperability and shakedown testing of avionics capable of transmitting and receiving ADS-B messages, receiving TIS-B messages, and displaying the combined ADS-B and TIS-B information to flight crews was conducted in April and May at Memphis International Airport. A series of simulations were conducted on the cockpit display of traffic information (CDTI) electronic flight rules (CEFR) to determine pilot/controller suitability, acceptance and human factors. In partnership with UPS, 107 ship sets of ADS-B avionics for installation on UPS 757/767 were procured and would support evaluation of enhanced visual approach applications.

16.11 In 2003, the Safe Flight 21 programme was continuing to conduct CEFR simulations, survey and deliver new airport digital maps to the surface moving maps database (up to 56 digital surface maps) and expand the vehicle tracking evaluation in Memphis (additional vehicles) and established a vehicle tracking test bed in Louisville, Kentucky. RTCA Steering Committee SC-186 (ADS-B) approved the 1090 MHz ADS-B Minimum Operations Performance Standard (MOPS), Rev A, and approved the Traffic Information Service Broadcast (TIS-B) Minimum Aviation System Performance Standards (MASPS). ADS-B demonstrations are occurring in the Gulf of Mexico in partnership with NASA, Petroleum Helicopter Inc. and Continental Airlines. ADS-B ground stations had been installed on oil platforms to demonstrate surveillance applications in a non-radar environment.

16.12 In 2000, under the Capstone initiative, the FAA equipped approximately 80 aircraft (out of 150 planned) with avionics equipment that includes a Global Positioning System (GPS), ADS-B using the Universal Access Transceiver (UAT) data link, and a terrain database to aid in terrain situational awareness. In addition, the MicroEARTS automation system at the Anchorage Air Route Traffic Control Center (ARTCC) was modified so controllers can track and monitor ADS-B-equipped aircraft. Based on the completion of these initial Capstone activities, on January 1, 2001, controllers in Anchorage began providing ADS-B “radar-like” services to aircraft in the Bethel area, the first use of non-radar surveillance for control purposes in the United States. The FAA continues to use operational ADS-B in the separation of air traffic within the State of Alaska.

16.13 As a result of Safe Flight 21 demonstration activities in Alaska and the Ohio River Valley, progress was being made toward implementing operational enhancements and applications related to the use of GPS, ADS-B, TIS-B, FIS-B, and the use of a multi-functional display in the cockpit and enhanced controller displays.

16.14 The NAS Modernization 2002 update approved by the Administrator in October 2002 and the FAA ADS-B link decision recognize a national deployment of 900 ADS-B ground based transceivers by 2012. The Safe Flight 21 programme continues to evaluate and demonstrate potential applications to take full advantage of the ADS-B, TIS-B and FIS-B technology. The meeting was advised of the FAA’s Safe Flight 21 websites at:

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

Agenda Item 17: Air Traffic Management Operational Concept

1) review Agenda Item 1 of AN-Conf/11

17.1 The meeting considered Agenda Items 1 to 4 concerning ATM matters of the AN-Conf/11 to be held at Montreal from 22 September to 3 October 2003, and the Report of the AN-Conf/11 Preparatory meeting held at Bangkok, 27-28 January 2003.

17.2 The meeting noted that the ATM Operational Concept document developed by the Air Traffic Management Concept Panel (ATMCP) would be presented to the AN-Conf/11 under Agenda Item 1 and would also form the basis of the major part of the discussions under the ATM Agenda Items 2 to 4.

17.3 The meeting recalled that the ATM operational concept was a gate-to-gate approach that would facilitate implementation of a seamless global ATM system. In this regard, the global ATM operational concept describes how an integrated global ATM system should operate and would provide States and industry with clearer objectives for designing and implementing ATM and supporting systems. This aspect was of considerable interest to States and the regions in respect to determining operational requirements for implementation of airspace improvements associated ATM enhancements and supporting technology. The meeting endorsed the view of the AN-Conf/11 Preparatory Meeting, which emphasized that interoperability, efficiency and cost were of primary concern. Also, priority needed to be given to integrate present ATM systems and this work would be primarily undertaken at a regional level.

17.4 Of considerable interest to the meeting was how the ATM systems of today would transition to a global ATM system as envisaged in the ATM Concept, and expected AN-Conf/11 to give clear guidance on this matter. In this regard, the meeting reinforced the view of the Preparatory Meeting that the review and assessment of the ATM Concept by the AN-Conf/11 should have a practical focus that would facilitate the eventual acceptance and implementation of the ATM Concept into the planning framework of States and planning and implementation regional groups (PIRGs). Further, the meeting fully supported the comment made by the Preparatory Meeting that harmonizing air traffic services regionally has proved to be difficult to achieve, and implementation issues were major obstacles to achieving a global ATM system. In particular, interoperability issues States' ATM automated systems and aircraft systems had a significant impact on successful implementation of regional planning.

17.5 The meeting supported the approach taken in the ATM operational concept that the driver for change in the ATM system should be ATM user expectations within a framework of safety case/cost/benefit analyses and a business case. The meeting noted that, in the planning and implementation experience of this region, this matter was given high priority.

17.6 In regard to safety certification of ATM systems the meeting recognized that this was an important matter that required considerable in depth examination, and felt it would be difficult to achieve standardization given the wide range of ATM systems in use. The adopting of existing international standards for ATM systems such as the International Organization for Standardization (ISO) system of standards and certification, which were widely used by States, could be an approach to take. The users of ATM systems should expect and receive systems, which were installed and maintained to the highest possible standards irrespective of the airspace they were flying over, or entering. In this regard, the meeting noted that the expansion of the Universal Safety Oversight Audit Programme to include Annex 11 - *Air Traffic Services* and Annex 14 - *Aerodromes* in 2004 would further strengthen improving overall safety.

17.7 In regard to airspace safety management systems and programmes, the meeting noted the initiative taken by APANPIRG/12 to harmonize and centralize airspace safety monitoring programmes in the ASIA/PAC Region by investigating the setting up of a regional airspace safety monitoring organization, which would be decided by APANPIRG/14. The availability of safety management guidance material was a matter of priority and urgently needed by States in meeting the Annex 11 requirement for States to establish the acceptable level of safety and safety objectives applicable to ATS within airspaces and at aerodromes by 27 November 2003.

17.8 There was high expectation that the AN-Conf/11 would clarify the concept of use of Required System Total Performance (RSTP) and its components which would give direction to equipment manufacturers and ATS providers. The meeting reiterated that concepts needed to be rooted in practical application that met State requirements as reflected in regional air navigation plans.

17.9 In regard to enhancing capacity, the meeting noted the strides taken in the ASIA/PAC Region through a cooperative approach between ICAO, States and international organizations to utilize available CNS/ATM technology to improve the airspace structure, for example, the EMARSSH project and the revised South China Sea ATS route structure. Also, extensive use of ADS and CPDLC in the Pacific Region had been made, and plans were progressing to implement these systems in the Asia Region. There had been considerable progress made to enhance capacity in the international airspace of the Region, including widespread introduction of the reduced vertical separation minimum (RVSM). Similar attention had not been given by the international community to airports and terminal operations. It was recognized that airport capacity was the defining limiting factor in achieving maximum utilization of airspace capacity, and thereby gaining full benefits of a gate-to-gate ATM system. The meeting expected the AN-Conf/11 to address this matter and provide appropriate guidance on how to integrate, en-route, terminal and airport operations to achieve balanced capacity and demand.

17.10 The meeting noted that there was no regional specific item on the agenda of AN-Conf/11, although many of the subjects had regional relevance and would have significant impact on regional planning and implementation. A regional view or position on the conference agenda items had not been sought by ICAO and the meeting hoped that there would be full regional involvement in the post AN-Conf/11 activities. In regard to a regional perspective and bringing these before AN-Conf/11, it would be up to individual States to represent regional interests in the outcome of AN-Conf/11.

Agenda Item 18: Consider CNS/ATM training needs

Importance of Standard Knowledge and Procedures when conducting ATC Data Link Operations

Australia

18.1 Australia advised the meeting that, along with several other South Pacific air traffic service providers, they had been using CPDLC as the primary medium for communications in oceanic airspace since 1995. In 1999, Australia introduced ADS services in the South Pacific, and by early 2000, ADS and CPDLC services were being provided to more than a dozen aircraft operators in all Australian non-radar airspace.

18.2 It was noted by the meeting that the implementation of data link had brought about significant changes in pilot/controller communications practices, operating procedures and surveillance techniques. Aircraft operators, air traffic service providers and other industry groups had worked together to ensure the data link practices and procedures used from region to region are as standard as possible.

18.3 It was further pointed out that investigation of problem reports and incidents during more than 7 years of data link operations had highlighted the absolute necessity for pilots and controllers to use standard procedures and practices and to have understanding of the capabilities and limitations of data link systems. Most incidents involving missed communications, misunderstandings and failures to comply with ATC clearances could have been avoided if standard operating procedures and practices had been followed completely.

18.4 Comprehensive controller and pilot training programmes were essential for building the appropriate knowledge. Once training programmes for CPDLC and ADS were in place, aircraft operators must obtain operational approval from the relevant authorities in the State of registry prior to the operational use of ATC data link. Other state authorities may also have operational approval requirements. Operators should obtain the relevant requirements and guidance directly from States in which data link operations are expected.

Available Training Programmes

18.5 A number of airlines currently conducting data link operations had made their training programmes available to other operators on a commercial basis. A list of operators offering programmes can be obtained from IATA.

18.6 The meeting noted that Airservices Australia provides structured, one and two-day training courses covering all operational aspects of ATC data link. These courses had been specifically designed for aircraft operators, air traffic service providers and safety regulators.

18.7 Instructors with extensive experience in providing data link services use operational terminology to explain how ATC data link can safely and efficiently be used in an automated ATC environment. Aircraft operator courses include:

- a) Overview of ATC data link applications and concepts;
- b) Connection management;
- c) Standard Operating Procedures (including pre-flight);
- d) Automatic Dependent Surveillance operations ;
- e) Data link safety features;
- f) Emergency and abnormal operating procedures;

- g) How ATC processes and uses data link information;
- h) Lessons learned; and
- i) Flight scenario workshops where participants walk through typical data link flights.

18.8 The meeting also noted that ATC courses use a similar curriculum but concentrate on the ATC perspective.

Hong Kong, China

18.9 Hong Kong, China presented information on the importance of systematic and formalized training to personnel involved in the civil aviation industry. Hong Kong established the Hong Kong Civil Aviation Training Center in early 2003, which aims to deliver target oriented training programmes to aviation personnel on a global basis through a knowledge-sharing process.

18.10 To ensure the safety, efficiency and regularity of air transport services in the increasingly complex operating environment, personnel in the civil aviation industry must continuously demonstrate the highest level of professionalism, dedication and efficiency in their work. In this regard, quality, systematic and formalized training plays a vital role.

18.11 The Hong Kong Civil Aviation Department (CAD), as the regulator and service provider of civil aviation activities in Hong Kong, was committed to the provision of a safe and efficient air transport system. To reinforce its commitment and to respond to new challenges in the civil aviation industry, staff training had always been a main focus of the Hong Kong CAD, and they had developed comprehensive and target oriented training programmes for their staff. The establishment of the HKCATC in April 2003 builds on this experience and provides an opportunity for the CAD to make a contribution to improving the safety and efficiency of air transport through the establishment and conduct of systematic and formalized training for aviation personnel from around the world. Further information on the training programmes can be obtained through the Training Center Administrator on email: apsd@cad.gov.hk.

18.12 The meeting noted the advances made by Hong Kong, China in establishing the HKCATA and the approach taken in their training programmes to deliver quality, systematic and formalized training, and to make this available to the international aviation community.

Republic of Korea

18.13 The Republic of Korea presented information on the status of their international training course developed to contribute to the enhancement and promotion of safety for international civil aviation. The Republic of Korea had established specialized training courses on airway facilities and ATC not only for domestic personnel but also for international needs, contributing to the enhancement and promotion of safety in international civil aviation.

18.14 The Civil Aviation Training Center was established as a dedicated civil aviation technical training institute in 1984 and had trained in-country aeronautical technical personnel since then. From the year 2001, the government had sponsored international training courses in the area of airway facilities and ATC at no expense to international trainees. Further, in January of 2001, the Republic of Korea had established international training courses for aeronautical technical personnel from developing countries including those in Asia. These courses were conducted under co-sponsorship of the Civil Aviation Safety Authority, the Ministry of Construction and Transportation and the Korea International Cooperation Agency (KOICA), as part of a human resource development programme for developing countries.

18.15 The purpose of the international training courses was to improve the capability of operational personnel working in the area of airway facilities was ATC, to enhance international cooperation, and as a member of the ICAO Council to contribute to the promotion of international civil aviation safety. The training courses provide the opportunity for participants to experience Korean culture, and stimulates exchange of the latest aeronautical information and mutual understanding between the participating nations. The Republic of Korea would continue its effort to develop and expand the international training courses.

18.16 The meeting appreciated the contribution being made by the Republic of Korea to provide sponsorship to international personnel to attend its international training courses.

Agenda Item 19: Consider environmental issues related to CNS/ATM system.

19.1 Australia presented information on Airservices Australia's experience with aligning its Environmental Management System (EMS) to the International Standards Organisation (ISO 14001:1996 'Environment management systems – Specification with guidance for use'). This had proved to be an effective tool to facilitate the management of CNS/ATM environmental issues.

19.2 The ISO 14001 approach had enabled Airservices Australia, to:

- a) achieve a sound, systematic and due diligent approach to environmental management;
- b) improved its environment performance and reduce its business risks (eg potential liabilities and insurance); and
- c) demonstrate these achievements and that it is providing significant fuel savings to the aviation industry.

19.3 Consequently, the EMS had provided opportunities for improved public and stakeholder relations.

19.4 Airservices Australia's EMS ensures all changes to ATM practices that could impact on aircraft operations were assessed prior to implementation, to ensure that their potential impact had been minimised and were not significant. All environmental assessments were recorded in its advance risk management system (ARMS).

19.5 The EMS had helped to reduce Airservices Australia business risks and improve relations with stakeholders, the aviation industry, the public and regulators. With the efficiencies incorporated in the EMS, and in particular the efficiencies offered by ARMS, the implementation of the EMS was seen had having a very positive return on investment.

19.6 The meeting noted the information which provided a very positive approach to management of environmental issues.

Agenda Item 20: Review progress on the establishment of a Regional Airspace Safety Monitoring Agencies (RASMA).

20.1 The Chairman of the Asia Pacific Airspace Safety Monitoring Task Force (APASM/TF) reported to the meeting on the outcome of the work of the Task Force, which had been completed at its sixth meeting held in May 2003 in accordance with APANPIRG/12 (Conclusion 12/44). The APASM/TF was tasked to develop an airspace safety system performance monitoring structure and funding arrangements for the ASIA/PAC Region. APANPIRG/13 (Conclusion 13/45 refers) reviewed progress by the APASM/TF and agreed to continue the work of the Task Force, with its final report and recommendations to be presented to APANPIRG/14 in August 2003.

Structure of the organization

20.2 The Task Force initially developed a plan to establish a Regional Airspace Safety Monitoring Agency (RASMA), which would operate as a business entity fully funded by user charges, and under the authority of States, who would enter into multi-national agreements to make use of RASMA services.

20.3 During the course of its work, the Task Force considered that the institutional difficulties to form the RASMA as a business entity were too complex, and a number of States, for legal reasons, would have difficulty in making use of RASMA services. As existing airspace safety monitoring arrangements operated by States providing regional monitoring services in support of airspace implementation planning, were operating satisfactorily, the Task Force agreed that there was no requirement to establish a business organization. However, there was a need to coordinate and harmonize airspace safety monitoring activities on a regional and inter-regional basis, as well as to provide a common means of funding. Accordingly, establishing a permanent body of experts to periodically review and evaluate the results of airspace safety monitoring would significantly enhance the airspace safety monitoring process.

20.4 The Task Force decided that the body should be established as a Sub-Group of APANPIRG operating within the ICAO system in accordance with the APANPIRG Procedural Handbook, and named the Regional Airspace Safety Monitoring Advisory Sub-Group (RASMA/SG). The establishment of the RASMA/SG should ensure that a group of multi-disciplinary experts would be permanently available to advise APANPIRG and States on airspace safety matters.

Existing monitoring services

20.5 Within the ASIA/PAC Region, airspace safety monitoring is carried out by several monitoring agencies: the United States FAA operates APARMO for RVSM monitoring in the ASIA/PAC Region and safety assessment services for its FIRs, Airservices Australia provides safety monitoring services for RVSM in its FIRs and other safety assessment services for the Asia Region, the Civil Aviation Authority of Singapore provides monitoring for RNP operations on the South China Sea ATS route structure, and AEROTHAI, Thailand was planning to take over RVSM monitoring responsibilities from APARMO for the Asia Region. Other States, e.g. India and Japan were establishing national monitoring programmes and indicated their willingness to provide regional or sub-regional airspace safety monitoring services.

20.6 Additionally, monitoring services were provided through the ISPACG and the IPACG, which established Central Reporting Agencies (CRAs) and FANS Interoperability Teams (FITs) for data link applications, i.e. ADS and CPDLC. In addition, the FANS Action Team – Bay of Bengal (FAT-BOB), had been established by ICAO for the Bay of Bengal area under the BBACG, and a similar arrangement was to be established for Southeast Asia (FAT-SEA) under the SEACG.

20.7 It was envisaged that in order to provide an effective role, the membership to the RASMA Sub-Group should be from States and international organizations with extensive experience in conducting airspace safety monitoring, safety assessments and airspace safety management.

Funding arrangements

20.8 In regard to funding, aircraft height-keeping performance monitoring services were presently being funded where required on a “user pays” basis. In addition, airspace data collection, analysis and safety risk assessments had been carried out for the region using human and technical resources provided by some States and organizations at no cost to the user. It is expected that user charges would continue to be the main means of funding airspace safety monitoring services. The provision of monitoring services would need to be provided in a cost effective manner based on cost/benefit considerations.

Stakeholder considerations

20.9 Stakeholders comprise a cross section of the aviation community from the air traffic service providers and airspace users through to the communications service providers. Their needs were diverse but all had a safety obligation to meet international standards and recommended practices. The establishment of a dedicated permanent regional airspace safety oversight body centralizes these activities.

20.10 The stakeholders require airspace safety monitoring and safety assessment services to continue the development and improvement of the regional airspace, while providing a safe and efficient environment for aircraft operators. It was essential that the Asia Pacific Region have in place a transparent airspace safety oversight capability to which all States contribute and participate. These were best achieved for international airspace through ICAO and its contributing bodies.

Establishment of RASMA

20.11 The meeting recognized that the RASMA Sub-Group would provide a framework for airspace safety monitoring services at a time when further monitoring activities are being established for implementation of ADS and CPDLC in the Asia Region as mentioned above. The present airspace monitoring activities were extensive and would continue to grow as more States provide data link capability and implement reduced vertical and horizontal separation minima. Therefore, it was timely to establish the RASMA Sub-Group to provide support and to keep airspace safety monitoring activities under review and to report to APANPIRG. The meeting endorsed the establishment of the Sub-Group.

Agenda Item 21: Review and identify deficiencies in the CNS/MET fields

21.1 The meeting noted that the ICAO Council, at the 164th Session on 30 November 2001, approved the single definition of shortcomings and deficiencies as follows:

“A *deficiency* is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation”.

21.2. The meeting was advised that a State letter was sent to States by ICAO Secretary General to Ministers responsible for civil aviation (State letter M 6/1-02/79, dated 27 September 2002), with the list of deficiencies in the State concerned as identified by the APANPIRG. In the letter it was emphasized that the deficiencies should be resolved through a plan of action and the allocation of the necessary financial and human resources.

21.3 The meeting noted that APANPIRG/13 in its Decision 13/46 established a Task Force on Deficiencies in the Air Navigation Field and the first meeting will be held from 22 to 23 July 2003. The Task Force would develop detailed regional complementary procedures for identification, assessment, reporting and monitoring of the status of air navigation deficiencies as supplement to the uniform methodology.

21.4 The list of deficiencies in the CNS and MET fields were reviewed and updated. The meeting also noted the outcome of the review of deficiency carried out by the ATS/AIS/SAR SG meeting, which was included in the report of the ATS/AIS/SAR SG. A new deficiency in the MET field was identified and included in the list. The list of CNS and MET deficiencies as updated by the meeting is provided in Appendix AA.

- Agenda Item 22: Future Work Programme**
1) review Task List of the CNS/MET/SG
2) review the work programme of the CNS/ATM IC SG

1) Review Subject/Tasks List of the CNS/MET Sub-Group

22.1 The meeting reviewed the Terms of Reference of the CNS/MET Sub-Group and did not see the need to propose any change.

22.2 The meeting then reviewed the Subject/Task List of the CNS/MET Sub-Group. It was noted that of the 38 tasks 28 tasks were completed. It was noted that the Task No. 31 had identified the need to provide COM facility to support aircraft access to OPMET data bank. It was recognized that it was not operationally required to provide data link at 5 OPMET data banks in the ASIA/PAC region. Instead, it was considered desirable to provide access to VOLMET broadcast stations by aircraft via data link in accordance with Key Priority in the CNS/ATM Implementation. The Task No. 31 was therefore, amended accordingly in line with the Key Priority. Tasks No. 32 and 37 were amended to reflect new developments in the MET field. New Tasks, No. 39 on the improvement of the OPMET exchange in the ASIA/PAC region, and No.40 on the development of Quality Management Systems for the meteorological services provided for the international air navigation, were added to the list.

22.3 The target dates, actions proposed and/or in progress were updated to indicate progress.

22.4 The updated Subject/Task List is provided in Appendix BB. In consideration of the foregoing, the meeting formulated the following Draft Decision.

Draft Decision 7-10/40 – Update Subject/Tasks List of the CNS/MET Sub-Group

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

Report of the review of the terms of reference and work programme of CNS/ATM/IC/SG

22.5 The meeting reviewed the Terms of Reference and work programme of the CNS/ATM/IC Sub-Group as amended by APANPIRG/13 Decision 13/43. The meeting was concerned that there should not be duplication of work between the Sub-Groups, although there were items of common interest. A working group was formed to undertake the review and took into account the TORs of the ATS/AIS/SAR/SG and the CNS/MET/SG.

22.6 The meeting recalled that APANPIRG/13 observed that implementation of CNS/ATM needed to be accelerated to derive early benefits and that the Sub-Group's activities were important to achieving this objective. APANPIRG/13 was therefore of a strong view that this Sub-Group should continue to carry out its functions in accordance with the TORs revised by APANPIRG/12. Also, in light of the importance of environmental issues, APANPIRG/13 amended the TORs of the Sub-Group to include more specific requirements to address environmental issues.

22.7 The meeting was of the view that AN-Conf/11 would produce results that could have a major impact on the future planning and implementation of CNS/ATM in the regions, in particular in regard to ATM and application of the ATM operational concept. Also, developments in technology such as ADS-B, airborne separation assurance systems, data link communications and satellite voice

communications would need to be reviewed, and the *Asia/Pacific Regional Plan for New CNS/ATM Systems* revised and guidance material developed as appropriate. This could lead to new work items to be undertaken by the Sub-Group. Further, the meeting recognized that the present work programme was not task orientated and that it should be reviewed and a detailed task list with timelines developed to guide its future work. Accordingly, the meeting agreed that in view of the importance of AN-Conf/11 to the future of CNS/ATM and the anticipated outcome, a major review of the Sub-Group work programme should be undertaken, especially to look at those issues that need to be progressed, such as training and environmental matters. Also, there was a need to prioritize the work, in particular for CNS/ATM implementation requirements, and to coordinate more closely with other APANPIRG contributory bodies, to ensure that the Regional Plan for CNS/ATM was up to date and meets State and user requirements.

22.8 The meeting noted that new activities were being proposed to APANPIRG/14, which could lead to additional groups being established, i.e. the ATS Route Network Review Task Force proposed by ATS/AIS/SAR/SG/13, the establishment of the RASMA Sub-Group and the FANS Action Teams to be established by BBACG and the SEACG for implementation of ADS and CPDLC services. This would increase the workload of the Regional Office and stretch its resources, already under considerable constraint. Also, this would impose additional burden on participating States and international organizations. In this regard, it was important to review in detail the work programme of the CNS/ATM/IC/SG to clearly define tasks and timelines, and to identify desired benefits.

22.9 The meeting agreed that to undertake a thorough review as envisaged above was beyond the capability of this meeting and a Task Force should be formed to undertake this work after the AN-Conf/11 meeting in October. The meeting agreed that the Chairpersons of the APANPIRG Sub-Groups should participate in the Task Force. Accordingly, the meeting formulated the following Draft Decision:

Draft Decision 7-10/41— Establishment of a Task Force to review and revise as appropriate the Terms of Reference and work programme of the CNS/ATM/IC Sub-Group on a task orientated basis

That, a Task Force be established to review the terms of reference and work programme of the CNS/ATM IC/ Sub-Group to develop a detailed task list and timelines, and identify benefits to be derived from the work programme, taking into account relevant results of AN-Conf/11.

Outstanding Conclusions

22.10 The meeting reviewed the status of implementation of the Outstanding Conclusions of APANPIRG in the CNS/ATM and MET fields. The result of the review is provided in Appendix CC

Agenda Item 23: Any other business

Change to the Title of the ATS/AIS/SAR Sub-Group

23.1 The meeting was informed by the Secretariat of a proposal by ATS/AIS/SAR/SG/13 to change the title of the Sub-Group to the ATM/AIS/SAR Sub-Group.

23.2 The ATS/ASI/SAR/SG/13 recognized that the work of the Sub-Group had expanded to address issues outside traditional ATS fields. In this regard it was recalled that as defined in Annex 11, ATS is a generic term meaning variously, flight information service, alerting service, air traffic advisory service, and air traffic control service (area control service, approach control service and aerodrome control services). The Sub-Group's work includes consideration of various ATM activities such as airspace management (ASM), air traffic flow management (ATFM) issues, ATM enhancement measures including data link systems such as ADS and CPDLC. Also, airspace safety management systems were an important consideration especially since this was included in Amendment 41 to Annex 11 effective on 28 November 2002.

23.3 The ATM functions above are elements within the ATM system as described in the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750) and the ATM Operational Concept Document. In this regard, the ATS/ASI/SAR/SG agreed that it would be more appropriate to use the term ATM as the title for the Sub-Group.

23.4 In regard to AIS, the major objective of AIS was to ensure the flow of information necessary for the safety, regularity and efficiency of international civil aviation. It provides essential support to the ATM system, which was dependent upon AIS to function. In view of the important role of AIS and its impact on the safety of the ATM system and flight operations, the Sub-Group decided that AIS should be retained in the title as a separate entity.

23.5 In consideration of whether to include SAR, it was noted that SAR was not one of the elements of ATM as described in the Global Air Navigation Plan or in the ATM Operational Concept Document. Therefore, the ATS/AIS/SAR Sub-Group decided that SAR should also be kept separate from ATM, although it was closely related to ATM activities.

23.6 In light of the foregoing, the ATS/AIS/SAR Sub-Group considered it was appropriate and timely to revise its title to the ATM/AIS/SAR Sub-Group. Accordingly, a proposal to this effect would be made to APANPIRG/14.

23.7 The meeting noted the information and supported the change to the title proposed by ATS/AIS/SAR/SG.

Next Meeting

23.8 The eighth meeting of the CNS/MET Sub-Group will be held in Bangkok 12-16 July 2004.

23.9 The tenth meeting of the CNS/ATM/IC/Sub-Group was tentatively scheduled to be held in Bangkok 26-30 July 2004.