AGENDA ITEM 3: CNS/ATM IMPLEMENTATION AND RELATED ACTIVITIES

Agenda Item 3: CNS/ATM Implementation and Related Activities

Results of the Eleventh Air Navigation Conference (An-Conf/11) 2003 – Follow-up action to be taken by APANPIRG

3.1 The meeting was presented with a report on the outcome of, and actions taken by, the Council of ICAO on the Eleventh Air Navigation Conference held in Montreal from 22 September to 3 October 2003. The Conference, while focusing its attention on Global ATM systems, developed sixty-one recommendations enveloping a wide range of issues and called for further follow-up by ICAO, States, international organizations and Planning and Implementation Groups (PIRGs), as well as CNS/ATM partners.

3.2 The Council of ICAO on reviewing the report of AN-Conf/11 recommended the follow-up action that should be taken by States, PIRGs, and international organizations. In this regard, the meeting reviewed and agreed with the recommendations of the Council, taking into account the outcome of the report of the Future Direction Task Force (see paragraph 3.7 below).

3.3 In light of the foregoing, the meeting formulated the following Decision and Conclusions:

Decision 15/46 – Implementation of AN-Conf/11 Recommendations by APANPIRG

That, the following recommendations of AN-Conf/11 be studied by the concerned Sub-groups, action taken to implement them, and the outcome presented to APANPIRG:

Recommendations 1/1, 1/10, 1/13, 4/1, 4/2, 6/11 and 7/1: ATM/AIS/SAR/SG
Recommendations 1/1, 1/10, 1/13, 4/1, 4/2, 6/11, 7/1 and 7/3: CNS/MET/SG
Recommendations 4/8: DRTF

Conclusion 15/47 – Implementation of AN-Conf/11 Recommendations by States

That, States of the Asia/Pacific region take action to implement the following twenty-five recommendations of AN-Conf/11:

1/1, 1/2, 1/7, 1/10,1/13, 1/15, 2/2, 2/3, 2/7, 2/8, 4/1, 4/2, 4/5, 4/6, 4/8, 4/9, 5/1, 6/1, 6/2, 6/9, 6/13, 6/14, 7/1, 7/2 and 7/3

Conclusion 15/48 – Implementation of AN-Conf/11 Recommendations by international organizations

That, international organizations take action to implement the following twelve recommendations of AN-Conf/11:

1/1, 1/7, 1/10, 1/13, 4/8, 5/1, 6/1, 6/2, 6/9, 6/13, 7/2 and 7/3

Report on the global and regional developments in the modernization of air navigation systems

3.3 The meeting was presented with an overview on global and regional developments in the modernization of air navigation systems and as well as a number of updates on various issues. The

meeting among other things noted the following:

a) a summary of work of ICAO`s Planning PIRGs;

b) development status of Standards and Recommended Practices (SARPs) and guidance material;

c) work programmes of various panels and Study Groups engaged in CNS/ATM related activities; and

d) comparative analysis of regional developments in air navigation systems.

3.4 The meeting was informed that the Commission made the following observations:

a) the general observations made in the previous annual report were still valid;

b) although good progress had been made with implementation of certain elements of CNS/ATM systems, the overall pace of implementation was understandably slower than originally expected; and

c) invited PIRGs and States to enhance their activities in the area of planning and implementation of CNS/ATM systems.

Report of the meeting of the APANPIRG Future Directions Task Force (FDTF)

3.5 APANPIRG/14, in making provision for the effective regional management by APANPIRG of the potential outcomes of AN-Conf/11, and considering the need to review the work programme of the CNS/ATM/IC/SG, established the Future Directions Task Force (FDTF) under Decision 14/47. The first meeting of the FDTF was held at the Regional Office on 17 – 19 May, 2004. The meeting was attended by 30 participants from 9 States and 3 international organizations.

3.6 In accordance with its TORs and after considering the outcomes of the AN-Conf/11, the FDTF was required to ensure that APANPIRG was fulfilling its mandate in line with the Procedural Handbook by:

a) reviewing the terms of reference and work programmes of APANPIRG’s contributory bodies;

b) reviewing the coordination, effectiveness and efficiency of the Sub-groups to achieve the APANPIRG objectives taking into account the TORs and work programme of each Sub-group; and

c) making recommendations as to the changes that may be necessary in the operation of APANPIRG’s contributory bodies.

3.7 The FDTF reviewed the outcomes of AN-Conf/11 and the actions taken by the Council of ICAO in regard to the recommendations of AN-Conf/11. The Council agreed to a number of recommendations, which called for further follow-up work by ICAO, States, international organizations and PIRGs, as well as CNS/ATM partners. The FDTF reviewed the suggested recommendations and agreed to the assignment of the AN-Conf/11 recommendations to the APANPIRG Sub-groups.

3.8 The FDTF also reviewed the TORs and work programmes of the following APANPIRG Sub-groups and contributory bodies:

a) CNS/MET Sub-group

b) ATN Transition Task Force

c) ADS B Study & Implementation Task Force

d) ATM/AIS/SAR Sub-group

e) RASMAG

f) RVSM Task Force

g) ATS Route Network Review Task Force

h) CNS/ATM/IC Sub-group

3.9 In regard to the contributory bodies, the FDTF considered that the TORs and work programmes of the contributory bodies reviewed were suitable without amendment to meet the required tasks, and that the contributory bodies were effective and efficient in undertaking the work of APANPIRG.

3.10 In regard to the Sub-groups, the FDTF noted that the role and function of the CNS/ATM/IC/SG had been the subject of considerable scrutiny and discussion since APANPIRG/10 in September 1999. The FDTF considered that the TORs of both the ATM/AIS/SAR/SG and the CNS/MET/SG were appropriate for the present work programme of the respective Sub-group. Also, it was noted that there was significant overlap of the work programmes of both these Sub-groups with the work programme of the CNS/ATM/IC/SG.

3.11 The FDTF identified that there were essentially only three areas of the TOR of the CNS/ATM/IC/SG that did not overlap with the other two Sub-groups. In regard to the first item concerning the development of a framework for regional training plans for the introduction of CNS/ATM systems, no significant work had been undertaken recently. In the context of implementation, where the introduction of new CNS/ATM systems and operating procedures require training elements, this aspect was being effectively addressed in implementation plans by the Task Forces concerned. The FDTF recognized that training issues were an important part of operational considerations and where specific training needs were identified, these would be dealt with by the implementation groups and ATS coordination groups concerned.

3.12 The FDTF considered that the second item regarding business cases, and the third item regarding environment issues were closely related to implementation, and would be included in implementation planning and considered by the relevant implementation groups. Matters of a more general nature arising from ICAO's work in these fields would be brought to the attention of the respective groups and APANPIRG by the Regional Office. The FDTF noted from the experience of the RVSM/TF, the significant part that operational training and business cases played in the implementation of RVSM, and that substantial fuel savings had led to significant environmental benefits.

3.13 Whilst acknowledging the very effective role undertaken by implementation Task Forces, Australia and the United States noted the importance of training and environmental issues, observing that neither of these items were specifically included on the TORs of either the

ATM/AIS/SAR or CNS/MET Sub-groups. The meeting noted that the TORs of each Sub-group and contributory body were regularly reviewed and that these matters would therefore be addressed as required. The Chairman noted that training was inevitable in any implementation because if the training was not done, the implementation could not proceed.

3.14 During its review of the TORs of the Sub-groups, the FDTF identified some tasks that should be incorporated into the task lists of the ATM/AIS/SAR and CNS/MET Sub-groups and formulated the following Decision:

Decision 15/49 – Assignment of new tasks to the ATM/AIS/SAR and CNS/MET Sub-groups

That, the following tasks be included in the Subject/Tasks List of the ATM/AIS/SAR and CNS/MET Sub-groups:

a) review key priorities for implementation of CNS/ATM systems for the Asia/Pacific region, identify new items as required and monitor implementation; and

b) make recommendation aimed at improving ATM and CNS support for Terminal Area and Airport Operations, respectively.

3.15 On completing its review of the TORs of the three Sub-groups, the FDTF agreed that the TORs of the CNS/ATM/IC/SG were being already covered or could be adequately covered by the other two Sub-groups and the Regional Office. Accordingly, the FDTF recommended for consideration by APANPIRG/15 that the CNS/ATM/IC/SG be dissolved. The United States, Australia and IATA supported the proposed decision, noting that care should be taken to ensure the environmental and training issues discussed above were addressed. A number of other States including Hong Kong, China and Japan also agreed to dissolve the Sub-group and the following Decision was adopted:

Decision 15/50 – Dissolution of the CNS/ATM Implementation Coordination Sub-group

That, in consideration of optimizing the effectiveness and efficiency of the contributory bodies of APANPIRG and in accordance with the provisions of the APANPIRG Procedural Handbook, the CNS/ATM/IC/SG be dissolved.

3.16 In recommending the dissolution of the CNS/ATM/IC/SG, the FDTF expressed its appreciation for the substantial contribution the CNS/ATM/IC/SG had made to the work of APANPIRG since it was established by APANPIRG/4 in 1994 to facilitate, promote and educate States and partners on the ICAO CNS/ATM system. The fact that CNS/ATM was an intrinsic part of the air navigation system in the Asia/Pacific region, was credit to all members who had served the Sub-group. The meeting concurred with the Task Force and acknowledged the excellent work the Sub Group had accomplished.

3.17 In view of the outcome of the FDTF and its recommendation to dissolve the CNS/ATM/IC/SG, APANPIRG member States were advised and consulted on whether to convene the tenth meeting of the CNS/ATM/IC/SG scheduled from 26 to 30 July, 2004. It was decided to postpone the meeting until after APANPIRG/15 had considered the recommendations of the FDTF.

3.18 At the end of the FDTF meeting, it was agreed that the work of the Task Force had been completed and no further meetings were required. Accordingly, the meeting agreed that the FDTF should be dissolved and formulated the following Decision to this effect:

Decision 15/51 – Dissolution of the Future Directions Task Force

That, the Future Directions Task Force, having completed its work programme as set out in its Terms of Reference, be dissolved.

Key Priorities

3.19 In reviewing the list of APANPIRG Key Priorities for CNS/ATM Implementation, as updated by the CNS/MET/SG/8 and ATM/AIS/SAR/SG/14 meetings, the meeting recognized that the list now contained 17 items. In this regard, the effectiveness and appropriateness of the current Key Priorities list was questioned.

3.20 The United States considered that it was important to maintain ome type of key priorities list in order to provide summary information on the activities considered particularly important to APANPIRG. The meeting agreed that any list of this nature should be highly focused, fit for the purpose intended, time bounded and succinct. Further, the list should also be reviewed and updated regularly.

3.21 Australia updated the meeting regarding the history of the key priorities list, noting that the intention of the list had been to facilitate CNS/ATM implementation programmes by highlighting matters that should be given priority for implementation. A way forward was suggested, under which the Sub-groups would compile and maintain key priority lists of matters relevant to the respective Sub-group. The lists were to be kept to a minimum number of items and contain items adopted by APANPIRG as priorities for CNS/ATM implementation that would serve to focus the Sub-groups' work programmes.

3.22 The meeting agreed to retain the current list of key priorities as updated by the Sub-groups, and adopt the mechanism whereby the Sub-groups compile and evaluate key priorities relevant to their activities and present these to APANPIRG. The current list is retained as **Appendix A** to the Report on Agenda Item 3 to facilitate the compilation of suitable Sub-group key priority lists.

3.23 In light of the foregoing, the meeting formulated the following Decision:

Decision 15/52 – Sub-group Key Priority Lists

That, in order to identify priorities for CNS/ATM implementation programmes or highlight other critical functions of the Sub-groups' work programmes, the CNS/MET and ATM/AIS/SAR Sub-groups are to compile and evaluate Key Priority lists relevant to their activities for review by APANPIRG. Lists should be highly focused, fit the purpose intended and be time bounded.

Delayed ADS-C reports in Australian airspace

3.24 The meeting was advised by Australia that in recent times, problems relating to the occasional delayed receipt of late ADS-C reports and/or CPDLC downlinks from aircraft in Australian airspace have been observed. Australia had conducted an analysis of ADS-C reports received by Brisbane and Melbourne Centres over a 6 month period in order to:

a) gain an indication of the relative frequency of these 'delayed' ADS-C reports;

b) identify any problem locations (if any) where delayed reports were more prevalent; and

c) identify whether the problem was possibly related to a specific airline or aircraft type.

3.25 The analysis had involved determining the transmission delay for each ADS-C basic report. The transmission delay was defined to be the difference between the time stamp contained in the ADS-C report, and the time of receipt of the ADS-C report by TAAATS. ADS-C reports subject to minor (between 300 and 500 seconds) and major (greater than 500 seconds) delays had been stored, to allow later trend analysis. A sample of 27968 ADS-C reports was analyzed, of which 105 were classified as minor delay and 138 as major delay.

3.26 FIT and CRA analysis determined that there was certain equipment (Satellite Data Unit) from a specific avionics manufacturer that was common to the aircraft types suffering these problems. The manufacturer had been advised of the findings, however the time frame to implement a fix was unknown.

3.27 Australia reported that it appeared that the problem was related to the transition of the aircraft from one satellite 'spot beam' to another. This problem causes the avionics to "buffer" data link downlink messages (ADS-C and CPDLC), and to transmit the contents of the buffer at a later time. It was noted that data link uplink messages appeared to be unaffected by this problem.

Surveillance implementation programme for the Tahiti FIR

3.28 The meeting was provided with information regarding the increase in surveillance capability in the Tahiti FIR, noting that IFR flights to or from Tahiti Faa'a airport during 2003 increased by 4.9 percent over 2002 figures.

3.29 Tahiti have already moved from fully procedural ATC to ADS/CPDLC based ATC for en-route oceanic traffic, utilising a Linux based VIVO system. Planned improvements include CLAM (Conformance Level Adherence Monitoring) and improvement of ADS. Safety studies had also commenced to enable the use of RNP10 based separation minima in the Tahiti FIR.

3.30 In addition, a programme for the installation of a monopulse secondary radar providing surveillance within the Faa'a airport terminal airspace was commenced in June 2004 with target date for implementation of 2007. Studies have also commenced regarding the implementation of ADS-B to provide extended automated surveillance over a large area utilized by domestic en-route traffic.

Assessment of environmental benefits of CNS/ATM Systems — Need for guidelines at the national level

3.31 This meeting noted that the Sixth Meeting of the Committee on Aviation Environmental Protection (CAEP/6) held in February 2004 adopted a series of recommendations on aircraft engine emissions which have since been considered by the Council of ICAO. They reflect the three principal approach that ICAO is pursuing to limit or reduce emissions, namely taking action at source, reducing fuel burn through market-based measures, and by operational measures, the latter encompassing measures related with the implementation of CNS/ATM systems.

3.32 The meeting was apprized that considerable effort has been made by CAEP to estimate the aviation's emissions impact and sophisticated emissions models are currently being developed to estimate the benefits which accrue from the different emissions reduction measures.The first model to address environmental benefits of CNS/ATM Systems implementation was the parametric model developed by CAEP. The results demonstrated overall fuel savings, and associated reductions of CO_2, on the order of 5 per cent annually in both the U.S. and European regions. In the meantime, the meeting was informed of the development of new modelling efforts — specifically AERO2K in Europe and SAGE (System for assessing Aviation's Global Emissions) by the United States — that had the potential to do these regional studies.

3.33 In terms of implementation of CNS/ATM systems, although the different elements could be implemented using global, regional, sub-regional or national approaches, the meeting acknowledged that, ultimately, it was the State which actually invests in the infrastructure and as such needs to know what the costs and benefits are. Recognizing such a need, the meeting noted that ICAO has just completed developing the relevant business case guidance material that includes financial analysis and risk management by means of user friendly software. This guidance on business case analysis, while quantifying the technical, operational and economic benefits, it makes only qualitative reference to environmental benefits. Consequently, the meeting agreed on the need for the development of model and associated guidance material for estimating environmental benefits at the national level. Such a model and resultant estimated benefits would further reinforce the approach of the States for the transition to CNS/ATM systems. In this context, the meeting noted that the main focus of CAEP was at the global and regional levels and as such necessary tools were being developed to undertake this task.

3.34 The meeting recognized that the level of maturity and complexity of these global/regional tools and their proprietary nature would not allow States to use them in their business case analysis. To respond to specific needs at the national level, the meeting noted the advice of CAEP that a more practical tool would be necessary.

3.35 Consequently to develop such a tool at the national level, the meeting agreed to extend its support and assistance to CAEP through regional CNS/ATM experts. Accordingly the meeting agreed to allocate this task to ATS Route Network Review Task Force (ARNR/TF) and developed the following decision:

Decision 15/53 – Developments of simplified tools and associated guidance for estimating environmental benefits of CNS/ATM systems at the national level

That, the ATS Route Network Review Task Force support CAEP in developing a simplified tool and associated guidance for estimating environmental benefits of CNS/ATM systems, and that the tool be applied in its task of route review to reflect environmental benefits accordingly.

CNS/ATM Implementation Planning Matrix

3.36 The meeting noted the CNS/ATM Implementation Planning Matrix, which contained the implementation status of CNS elements such as ATN, AIDC, CPDLC, GNSS and ADS. The Matrix was expected to be reviewed by APANPIRG and its Sub-groups on a regular basis to access progress of implementation. The updated Matrix is provided in **Appendix B** to the Report on Agenda Item 3.

GAGAN Implementation in India

3.37 India provided updated information on GPS and GEO Augmented Navigation in India (GAGAN), which is being implemented jointly by the Airports Authority of India (AAI) and the Indian Space Research Organization (ISRO). In the first phase of three phases, a Technology Demonstration System (TDS) with 8 Reference Stations (INRES), a Indian Master Control Centre (INMCC) and an Uplink Station (INLUS) with necessary communication links to connect the ground elements would be established. One of the GSAT series satellites, GSAT-4 would carry a navigation payload. The L-band Transponder would have L-1 frequency and would also have the capability to broadcast on L-5 frequency as and when this was used. The TDS phase was targeted for completion by mid-2006 and the Final Operational Phase will be completed by 2008. A contract had been signed for implementation of the ground elements of GAGAN.

Status of the U.S. Wide Area Augmentation System (WAAS)

3.38 The United States provided updated information on the status of the Wide Area Augmentation System (WAAS). WAAS performance consistently demonstrates 1 metre horizontal and 1.5 metres vertical accuracy. WAAS IOC provides users with the capability to fly approaches with vertical guidance throughout the U.S. NAS. This initial WAAS capability also provides improved guidance to users in the en route and departure domains. LNAV/VNAV was 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).

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

Asia/Pacific Regional Navigation Feasibility Study

3.40 The United States provided information on a regional navigation study performed for the APEC GNSS Implementation Team (GIT) by The MITRE Corporation and sponsored by the U.S. Trade Development Agency (US TDA). The objective of the study was to present the costs, benefits, and performance of various GNSS and augmentation systems for some economies in the Asia-Pacific region. The study should be completed in early 2005. The study was to concentrate primarily on the navigational areas and integration of navigation components in CNS/ATM technologies. It also should provide a "menu" for the economies to decide what components they really need and what costs they could realistically afford. MITRE would produce an interim report in the last quarter of 2004, which would be reviewed in a second meeting of the participating economies during November 2004.

Note:— APANPIRG/15 discontinued this List of key priorities. The list is retained to facilitate the compilation of key priorities lists for the respective APANPIRG Sub-groups

KEY PRIORITIES FOR CNS/ATM IMPLEMENTATION IN THE ASIA/PACIFIC REGION

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
1	ATN Implementation	Implementation of Ground-to-Ground element of ATN is required.	2005	CNS/MET ATN Transition Task Force.	Implementation plan to be completed and implementation to commence in 2005
2	Incorporation of CNS/ATM Material into Regional ANP & FASID	Incorporation of CNS/ATM Material into Regional ANP & FASID	Report to APANPIRG	ATM/AIS/SAR	On-going
3	WGS-84 Implementation	To achieve uniformity in aeronautical data publication across the Region in order to ensure a standard reference system for CNS/ATM.	Immediate (Effective Date was 1 Jan 1998)	ATM/AIS/SAR	Implementation is monitored at each meeting using the uniform format for the reporting of WGS-84 implementation.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
4	RVSM Implementation	To provide more efficient flight profiles and to increase airspace capacity in conjunction with the implementation of CNS/ATM.	Bay of Bengal – 27 November 2003 Domestic airspace of Tokyo and Naha FIRs and Incheon FIR – June 2005.	ATM/AIS/SAR	Completed On-going
5	RNP Implementation En-route RNP 10 & 4 Terminal RNP 4 & 1 Approach RNP 0.3	Implement RNP based navigation, operation and procedures to improve the efficiency and flexible use of airspace.	Report to APANPIRG	ATM/AIS/SAR	On-going Phased implementation.
6	ADS-C	The implementation of ADS in oceanic or remote areas in accordance with the Regional CNS/ATM Plan is required for the enhancement of safety and ATM.	Report to APANPIRG FIT-BOB reconvened September 2003. Bay of Bengal operational trial of ADS/CPDLC commenced February 2004 FIT-SEA inaugural meeting May 2004. South China Sea operational trial of ADS/CPDLC expected 2006/2007	ATM/AIS/SAR	Phased implementation. Revised Regional CNS/ATM Guidance Material developed containing ADS section. Implementation focus and timetable need to be developed. States are gaining experience in the use of ADS.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
7	Technical Co-operation in Regional CNS/ATM Planning & Implementation	The continuation and enhancement of ICAO's co-ordinating role of technical co-operation in CNS/ATM planning and implementation, in close co-operation with all partners and taking into account the regional approach, is required.	Report to APANPIRG	All	Sub-Groups to identify requirements.
8	Preparation for WRC-2007	The co-operative participation of States is required with their respective telecommunications regulatory authorities, regional groups, at the APT forums and at the WRC regional preparatory meetings for WRC-2007 to ensure that aviation spectrum requirements are fulfilled and protected.	WRC-2007	All	States are designating contact points responsible for preparation for WRC 2007 and are providing contact details for posting on the website to facilitate coordination.
9	GNSS Implementation • ABAS • SBAS • GBAS	To implement GNSS in accordance with the Asia Pacific Regional Strategy. Develop regional GNSS augmentation requirements Ensure region wide awareness of developing GNSS systems integrate into Regional Plan.	On Going. Report to APANPIRG	All	SBAS – WAAS IOC announced on 10 July 2003 SBAS receivers – (TSO C145/6) now available GBAS – FAA LAAS contract for delivery in 2009

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
10	ATS route implementation	To review and develop new requirements for ATS routes.	Report to APANPIRG APANPIRG/14 established the ATS Route Network Review Task Force (ARNR/TF). The first meeting is scheduled in September 2004.	ATM/AIS/SAR	On-going States to undertake review of current and future route requirements to submit to ARNR/TF
11	Final phase of WAFS	To implement transition to the final phase of WAFS to support the CNS/ATM system.	2005	CNS/MET WAFS Implementation Task Force	• WAFS Transition Plan and Procedures have been developed and are being successfully implemented. • Transfer of responsibility of RAFCs to WAFCs London and Washington has been implemented. • RAFCs have been closed.
12	MET Chapter 11 of the ASIA/PAC Regional Plan for New CNS/ATM System	To develop MET components of the ASIA/PAC CNS/ATM concept/strategy To develop MET Chapter of the Regional CNS/ATM Plan To identify the ATM	2003 2004 2005	CNS/MET with assistance of the ATM/AIS/SAR & METATM TF	• The first draft of MET Chapter of the Regional CNS/ATM Plan has been developed. • MET Chapter 11 of the Regional CNS/ATM Plan incorporated in issue 6 of the Plan. • METATM TF to survey the

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
		requirements for new MET products supporting CNS/ATM systems and update the plan accordingly.			requirement and update the MET components of the ASIA/PAC CNS/ATM Plan.
13	Data link Communications	Implementation of CPDLC.	On -going February 2004- CPDLC operational trial in the Bay of Bengal area. 2006/2007 CPDLC operational trial expected in the South China Sea area	All	Sub–Groups to review progress of implementation.
		AIDC to be introduced where ATM automated systems are implemented.	2005	All	Implementation focus and time-table need to be developed.
14	ADS-B	Data Link Selection for ADS/B recommended by ADS-B Task Force	2003	CNS/MET	APANPIRG/14 adopted 1090 MHz ES as the data link for ADS-B in ASIA/PAC region.
		ADS-B Task Force to develop implementation plan and sub-groups foster implementation.	2005	ADS-B Task Force	On-going
		States, where appropriate, implement ADS-B Air-Ground surveillance service on a sub-regional basis.	2006	All	On-going Australia actively progressing wide implementation of ADS-B.

NO.	KEY PRIORITIES	DESCRIPTION	MILESTONES	SUB-GROUP	STATUS
15	Implementation of APV and RNP Approaches	Review applicability of APV and RNP Approach Design Standards for Asia Pacific. Develop implementation strategy.	On Going. Report to APANPIRG	ATM/AIS/SAR	APV and RNP Design standards now in PANS OPS. Aircraft certified for RNP and APV approaches.
16	Data Link Flight Information Services (DFIS) applications	To implement the following applications via request/response mode of data link in the Asia and Pacific Regions: a) Data link –automatic terminal information services (D-ATIS); b) VOLMET data link service (D-VOLMET); c) Pre-Departure Clearance (PDC) delivery via data-link;	2008	All	Trials and demonstrations are conducted and some operational services are provided by States.
17	Safety Management Systems	States to establish national safety management systems and effective application of safety programmes which are required for the provision of air traffic services.	APANPIRG/14 established the Regional Airspace Safety Monitoring Advisory Group (RASMAG). First RASMAG meeting held 26-30 April 2004	RASMAG	Annex 11 provisions effective 27 November 2003. On-going RASMAG activities

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CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
AUSTRALIA	ATN tests were conducted. BIS Router and Backbone BIS Router and AMHS will be implemented by 2006.	AFTN based AIDC Implemented between Brisbane and Auckland.	Implemented and integrated with ATM systems to support FANS1/A equipped aircraft.	Implemented (S) 360 -370 GPS NPA Final 26 aerodromes completed 2004.	Developed en-route as (P) for approval to use in domestic airspace.	ADS-B trial being conducted. 27 ground stations are expected operational end of 2005 for upper air space which not cover by radar.	FANS 1/A ADS-C implemented.	
BANGLADESH	BIS Router and AMHS planned for 2005							
BHUTAN	ATN BIS Router and UA service 2008			Procedures developed for NPA as (S)				
BRUNEI DARUSSALAM	ATN BIS Router and AMSH planned 2006							
CAMBODIA	BIS Router and AMHS planned for 2005							
CHINA	ATN BIS Router AND AMHS will be implemented in 2005 and 2006.	AIDC between ACCs within China are being implemented.	Implemented to support ATS Route L888 and polar routes. Trial on HF data link conducted for use in western China.		Implemented in certain airspace as (S).	ADS-B trial will be conducted in 2004	FANS 1/A ADS-C implemented to support L888 and polar routes.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
HONG KONG, CHINA	- Tripartite BBIS trial with Beijing and Bangkok completed in Jan 2003; -64 Kbps ATN Link with Bangkok put into operational use in June 2004. -ATN trials with China and Japan conducted in 2003/04; -AMHS trials with China and Japan planned in 2004. Implementation of AMHS with Japan in 2005. - ATN/AMHS trials with Viet Nam, Philippines, Macao China planned in late 2004/2005.	Trial on the AFTN based AIDC with Guangzhou and Sanya, China commenced. Implementation planned for 2005.	FANS 1/A based CPDLC conducted. D-ATIS D-VOLMET and PDC implemented. VDL Mode-2 technical trial completed in Dec. 2002 and planning on further trials was in progress.	Pilot Programme on RNAV (GPS) departure procedures will be conducted in 2004.	Implemented in certain airspace as (S).	ADS-B trial using "ASMGCS" trial system in 2004/2005.	FANS 1/A Trials for ADS-C conducted.	
MACAO, CHINA	ATN BIS router and AMHS planned for 2nd half of 2005. Planning for trial with China and Hong Kong, China going on							ATZ within Hong Kong and Guangzhou FIRs. In ATZ full VHF coverage exist. Radar coverage for monitoring purposes.
COOK ISLANDS								
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA								

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
FIJI	AMHS in-house trials planned for 2003. AMHS trials with USA in 2004. ATN BIS Router and AMHS will be implemented in 2005.	Implementation of AFTN based AIDC with Brisbane and Auckland in 2003.	FANS-1. Implemented since 1997.	NPA procedures for (S) completed in Dec. 2002.	Implemented as (S).	ADS-B trials planned for 2004. Implementation in 2005/2006.	ADS-C implemented in oceanic airspace using EUROCAT 2000 X.	
FRANCE French Polynesia Tahiti		Implementation of limited message sets with adjacent centres under discussion.	FANS-1. Implemented since 1996.				FANS 1/A ADS-C implemented since March 1999.	
INDIA	ATN BBIS router and AMHS planned for implemention at Mumbai in 2005 and 2006.		FANS-1 implemented at Kolkata and Chennai. Planned for Mumbai and Delhi.		SBAS (S). Planned for 2005.	Considering using ADS-B to reduce coverage holes and proposal for trial to be conducted at Chennai.	FANS 1/A ADS-C implemented at Kolkata and Chennai. Plan to implement in Delhi and Mumbai.	
INDONESIA	ATN BIS Router and AMHS planned for implementation in 2005 and 2006.	AFTN based AIDC planned for implementation between Brisbane and Jakarta in 2004.	FANS-1/A. CPDLC in Jakarta, Ujung Pandang FIRs planned for 2005.	Procedure to be completed in 2006 for NPA (S).		Planning ATS-B round stations at 5 locations in the eastern part of Indonesia as first stage of phase I.	FANS 1/A ADS-C trial conducted at Jakarta ACC in 2005.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
JAPAN	ATN BBIS already implemented. AMHS implementation between Japan and USA in 2004 and between Japan and Hong Kong planned for 2005.	AIDC based. AFTN procedure implemented with Oakland USA.	FANS1/A system Implemented in Tokyo FIR.				FANS 1/A. ADS-C implemented in Tokyo FIR.	
KIRIBATI								
LAO PDR	ATN BIS Router and AMHS planned for implementation with Bangkok in 2005.		FANS-1/A Planned for Bay of Bengal and South China Sea areas. Equipment is under test operation.		Implemented as (S).		FANS-1/A. ADS-C planned for Bay of Bengal and South China Sea areas. Equipment under test operation.	
MALAYSIA	ATN BIS Router and AMHS planned for 2005.		Planned for Bay of Bengal and South China Sea areas.	NPA (S) at KLIA planned for 2003.			FANS 1/A ADS-C planned for Bay of Bengal and South China Sea areas.	
MALDIVES	BIS Router/AMHS planned for implementation in 2005.	Planned for 2006.	FANS1/A planned for 2006.		Trials planned for 2005-2008. Implementation in 2008.	Trials planned for 2004-2006. Implementation in 2006.		
MARSHALL ISLANDS				NPA (S) implemented at Majuro Atoll.				

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
MICRONESIA FEDERATED STATES OF								
Chuuk				NPA(S) implemented				
Kosrae				NPA(S) implemented				
Pohnpei				NPA(S) implemented				
Yap				NPA(S) implemented				
MONGOLIA	ATN BIS Router and AMHS planned for 2005 and 2006. Trial with Bangkok conducted		Function available. Regular trials are conducted.	GPS procedures are being developed and implemented at 10 airports.	Implemented as (P).	ADS-B trial in progress implementation planned for 2006.	FANS 1/A ADS-C implemented since August 1998.	
MYANMAR	Trial for ATN BIS Router with Thailand planned for 2003. Test with China planned for 2005.		Implemented since August 1998				Implemented since August 1998	
NAURU								
NEPAL	BIS Router and AMHS planned for 2005.			Development of arrival procedure and NPA as (S) completed. Departure procedure is being developed.	Implemented as (S).			

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
NEW ZEALAND	BIS Router and AMHS implementation planned for 2006.	AFTN based AIDC implemented between New Zealand, Australia and USA. Tests with Fiji planned	FANS/1A. Implemented	42 NPA implemented presently.	will be implemented as required.	Trials planned 2005. National coverage starts 2008 to be completed by 2015.	FANS 1/A Implemented.	
PAKISTAN	Implementation of ATN considered for Phase II (2005-2010).	Implemented between Karachi and Lahore ACCs	Implementation planned from 2005-2010.	Arrival and departure NPA procedure as (s) are being developed.	Planned for 2005-2010.	Planned for 2005 – 2010.	Planned for 2005-2010	RADAR coverage provided in Karachi and Lahore FIRs.
PAPUA NEW GUINEA								
PHILIPPINES	ATN BIS Router planned for 2005. Implementation for AMHS in April 2007.		D-ATIS and CPDLC Planned for 2008.				FANS 1/A ADS-C planned for 2008.	
REPUBLIC OF KOREA	ATN BIS Router/AMHS planned for 2005-2010.	AFTN based AIDC implemented between Incheon ACC and Seoul APP.	PDC & D-ATIS implemented 2003.			Planned for 2005-2010	Trial for FANS 1/A ADS-C implemented since 2003.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
SINGAPORE	ATN BBIS Router trial with Hong Kong conducted between April and June 2003. Trial with Thailand planned for 2004. Planned for ATN and AMHS implementation in 2005		Implemented since 1997. Integrated in the ATC system in 1999. D-ATIS implemented since February 2000.	NPA (S) procedure developed. RNAV (SID/STAR) in 2005	Implemented (S).	Trial planned for 2006.	FANS 1/A ADS-C implemented since 1997. Integrated with ATC system in 1999.	
SRI LANKA	ATN BIS Router Planned for 2005. AMHS planned along with BIS in 2005.		CPDLC implemented since November 2000.	NPA (S) planned for 2005.			FANS 1 /A ADS-C implemented since November 2000.	GPS based domestic route structure being developed.
THAILAND	ATN G/G system implemented for domestic services. BBIS/BIS Routers already implemented. AMHS 2005.	ATN based AIDC Implemented in Domestic Sector.	FANS-1/A Implemented.		Implemented as (S).		FANS 1/A ADS-C Implemented.	
TONGA	Target date for AMHS in 2006			NPA planned for 2010		Trial planned for 2010		CPDLC and ADS-C is not considered for lower airspace
UNITED STATES								
Anchorage			FANS1/A based CPDLC implemented.	NPA(S) implemented	En-route (P) implemented	ADS-B trials continuing.	FANS/1-ADS-C 2005.	

CNS/ATM Implementation Planning Matrix								
State/ Organization	**ATN G/G Boundary Intermediate System (BIS) Router/AMHS**	**AIDC**	**CPDLC**	**GNSS**		**ADS-B**	**ADS-C**	**Remarks**
				NPA Supplemental Means (S) Primary means (P)	**En-route Supplemental Means (S) Primary means (P)**			
Fairbanks				NPA(S) implemented		Trials continuing		
Oakland		AFTN based AIDC implemented. ATN AIDC planned for 2005.	FANS-1/A based CPDLC implemented.	NPA (S) implemented	En-route (P) implemented		FANS-1/A ADS-C planned for Dec. 2004.	
Salt Lake City (Network Centre)	AMHS implementation between Japan and USA scheduled for 2004. Acceptance testing completed. USA/China and USA/Fiji AMHS testing scheduled for 2004.	AFTN based AIDC implemented. ATN AIDC planned for 2005.						
VANUATU								
VIET NAM	ATN trials with Bangkok in July 2004. Implementation of ATN BIS Router planned for 2004 and AMHS in 2006.	ATN based AIDC planned in 2005.	Planned for 2005.	Planned for NPA (S) for 2004.	Implementation as (S) planned for 2004.		FANS 1/A ADS-C planned for 2005.	Most of air space in Hanoi and Ho-Chi-Minh FIRs covered by RADAR.