

INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE



REPORT OF THE SEVENTEENTH MEETING OF THE
APANPIRG ATM/AIS/SAR SUB-GROUP
(ATM/AIS/SAR/SG/17)

Bangkok, Thailand, 2 – 6 July 2007

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

Approved by the Meeting
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ATM/AIS/SAR/SG/17

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Attachment 1 List of Participants

Attachment 2 List of Working Papers and Information Papers

PART I – HISTORY OF THE MEETING

1. Introduction

1.1 The Seventeenth meeting of the APANPIRG Air Traffic Management/Aeronautical Information Services/Search and Rescue Sub-Group (ATM/AIS/SAR/SG/17) was held at the Kotaite Wing of the ICAO Asia and Pacific Regional Office, Bangkok, Thailand from 2 to 6 July 2007.

2. Attendance

2.1 The meeting was attended by 71 participants from 20 States, 2 Special Administrative Regions of China and 2 International Organizations. A list of participants is provided at **Attachment 1** to this Report.

3. Officers and Secretariat

3.1 Mr. Colman Ng, Assistant Director-General (Air Traffic Management), Civil Aviation Department of Hong Kong, China acted as Chairman of the Sub-Group and presided over the meeting throughout its duration.

3.2 Mr. Andrew Tiede, Regional Officer ATM, ICAO Asia/Pacific Office, was Secretary of the meeting and was assisted by two Regional Officers ATM, Mr. Kyotaro Harano and Mr. Polawat Chootai, and Mr. David Moores, ICAO ATM Expert.

4. Language and Documentation

4.1 The discussions were conducted in English. Documentation was issued in English with a total of 53 Working Papers and 19 Information Papers being considered by the meeting. A list of papers from the meeting is included in **Attachment 2** to this report.

5. Opening of the Meeting

ICAO Regional Office

5.1 The meeting was opened by Mr. Andrew Tiede on behalf of Mr. L. B. Shah, Regional Director, Asia and Pacific Regional Office. He welcomed all delegates to the meeting and highlighted the importance of the Sub Group in providing guidance to APANPIRG in order to assist with regional planning and implementation activities. Since the last Sub Group meeting, Mr Tiede considered that there had been impressive progress in many areas of ATM, AIS and SAR throughout the region with implementation milestones being widely met. Unfortunately progress in some areas, notably arrangements for the funding of regional airspace safety monitoring, had been slow and this was having a direct impact in decelerating some regional implementations. Mr. Tiede urged the meeting to identify solutions to these persistent problems and wished all delegates a fruitful meeting.

Chairman of the Sub-Group

5.2 Mr. Colman Ng, welcomed all delegates to the meeting, remarking that it is a known fact that economic development will put extra demands on civil aviation. With the high speed of economic development in the Region, the air transport industry is poised for staggering growth in the coming decade. While the expansion in the aviation industry offers plenty of business opportunities, Mr. Ng remarked that we must not lose sight of the challenges ahead of us as a result of such developments. The spiraling fuel cost, increasing concern on the impact of CO₂ emissions on the environment, and risks to safety and security to name just a few. Mr Ng sincerely hoped that our efforts in the coming few days would serve to enhance the progress made thus far and requested all parties to join efforts in making sure that this Sub-Group will play a pivotal role in helping to steer the work of the APANPIRG for the development of the aviation industry in the Region.

5.3 Mr. Ng drew attention to the long list of Working Papers and Information Papers for the meeting, which was indeed daunting. He considered that it was also indicative of the pressure to which the ICAO Regional Office was subject under the very stringent manpower constraints that they are facing. The sheer volume of paper work that has been put into this meeting only goes to show that we will all have to work very hard in the coming few days.

5.4 Having taken up the Sub-Group Chairmanship 2 years ago, Mr. Ng expressed his intention to gradually refine on the overall efficiency, effectiveness and, where possible, to re-prioritize the work items of the Sub-Group with a view to delivering results. To achieve this, everyone must keep their commitments — to do what we've said we will do in resolving specific problem areas in the air navigation field. He urged that all member states should work towards eliminating the long list of items in the Deficiency List.

5.5 Mr. Ng highlighted that, as all present would recognize, the final outcome of our work would only be as good as how many tangible results were delivered. He appealed to all to join the efforts in addressing problems with a disciplined and targeted approach. Mr. Ng looked forward to constructive interactions amongst participants in the coming week and hoped that we shall all work as a team to achieve our common goal – that is to enhance and optimize the overall air traffic system in support of the sustained growth of the industry in the Asia Pacific Region. Also, he expressed his thanks once again for the trust that delegates had conferred to him as the Chairman of the Sub-Group and was looking forward to a meeting that would be both effective and productive.

6. Draft Conclusions, Draft Decisions and Decisions of the ATM/AIS/SAR Sub-Group

6.1 The ATM/AIS/SAR Sub-Group records its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

- a) **Draft Conclusions** deal with matters that, according to APANPIRG terms of reference, merit directly the attention of States, or on which further action is required to be initiated by the Secretary according to established procedures.
- b) **Draft Decisions** relate to matters dealing with the internal working arrangements but requires the prior agreement of the APANPIRG before it can be implemented or otherwise.
- c) **Decisions** of ATS/AIS/SAR Sub-Group relate solely to matters dealing with the internal working arrangements of the ATS/AIS/SAR Sub-Group.

6.2 List of Draft Conclusions

Draft Conclusion 17/1	–	Conduct regional ATFM Seminar
Draft Conclusion 17/2	–	Adopt Version 3 Asia/Pacific AIDC ICD
Draft Conclusion 17/4	–	Global AFTN AIDC Interface provisions
Draft Conclusion 17/5	–	Assistance to States to improve AIS capability
Draft Conclusion 17/6	–	State Compliance with AIRAC notification periods
Draft Conclusion 17/7	–	Amendment to Chapter 3 of <i>Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region</i>
Draft Conclusion 17/8	–	Review of the NOTAM format
Draft Conclusion 17/9	–	Strategies to implement eTOD
Draft Conclusion 17/10	–	JWG Review of Regional SAR Capability Matrix
Draft Conclusion 17/11	–	Promulgate Recommendations of the ICAO February 2007 SAR Workshop
Draft Conclusion 17/12	–	Promote relationships between APANPIRG, APMHSA and the ICAO-IMO Joint Working Group
Draft Conclusion 17/13	–	Clarification of intent of Annex 2 in relation to variations in true airspeed
Draft Conclusion 17/14	–	Mandate Regional ADS-B Out implementation
Draft Conclusion 17/15	–	Guidance Material for the Asia/Pacific Region ADS/CPDLC/AIDC Ground Systems Procurement and Implementation
Draft Conclusion 17/16	–	Establishment of a Performance Based Navigation Task Force
Draft Conclusion 17/17	–	Development of State PBN Implementation Plans
Draft Conclusion 17/18	–	Development of model PBN approvals documentation
Draft Conclusion 17/19	–	Endorsement of the Use of ICARD System
Draft Conclusion 17/20	–	Satellite communications performance requirements

6.3 List of Draft Decisions

- Draft Decision 17/3 – Dissolution of AIDC Task Force
- Draft Decision 17/21 – ATS/AIS/SAR Subject/Task List

6.4 List of Decisions from ATM/AIS/SAR/SG/17

- ATM/AIS/SAR/SG/17 Decision 17/1: Actively pursue robust arrangements for the equitable funding of safety monitoring

**AGENDA ITEM 1: ADOPTION OF PROVISIONAL
AGENDA**

PART II – REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Provisional Agenda

1.1 The meeting reviewed the provisional agenda presented by the Secretariat and adopted the following agenda:

<u>Agenda Item 1:</u>	Adoption of Provisional Agenda
<u>Agenda Item 2:</u>	Review the APANPIRG/17 Report and subsequent ANC/Council Actions, with respect to ATM/AIS/SAR issues
<u>Agenda Item 3:</u>	Review and progress the tasks assigned to the ATM/AIS/SAR/SG by APANPIRG
<u>Agenda Item 4:</u>	Consider problems and make specific recommendations concerning the provision of ATM/AIS/SAR in the Asia/Pacific Region
<u>Agenda Item 5:</u>	Review of ATS coordination group meetings
<u>Agenda Item 6:</u>	Review progress of the Regional Airspace Safety Monitoring Advisory (RASMAG)
<u>Agenda Item 7:</u>	Review developments relating to CNS/ATM implementation
<u>Agenda Item 8:</u>	Deficiencies in the Air Navigation field
<u>Agenda Item 9:</u>	Update the list of ATM/AIS/SAR Tasks together with priorities
<u>Agenda Item 10:</u>	Any other business
<u>Agenda Item 11:</u>	Date and venue for next meeting

**AGENDA ITEM 2: REVIEW THE APANPIRG/17
REPORT AND SUBSEQUENT
ANC/COUNCIL ACTIONS, WITH
RESPECT TO ATM/AIS/SAR
ISSUES**

Agenda Item 2: Review the APANPIRG/17 Report and subsequent ANC/Council Actions, with respect to ATM/AIS/SAR issues

Review of APANPIRG/17 Report and ANC/Council Actions

2.1 The meeting reviewed the Report of APANPIRG/17 (21–25 August 2006) and subsequent actions by the Air Navigation Commission in its follow-up review (18 January, 2007 (174-2) — AN-WP/8183).

2.2 Detailed comments by the Commission in its review of the Report of APANPIRG/17 are provided in **Appendix A** to the Report on Agenda Item 2.

2.3 The meeting noted the actions taken by the Commission on items related to the ATM/AIS/SAR Sub-Group as follows:

Language proficiency provisions
(Paragraphs 2.1.96 to 2.1.101 of the APANPIRG/17 Report)

Urge States to ready themselves for the implementation of language proficiency provisions and to provide an update of their status as well as feedback on the difficulties experienced in the implementation of the provisions as soon as possible to their accredited Regional office but no later than during the next meetings of PIRGs.
(Action by: ICAO Headquarters ANB/FLS)

Improvement of aeronautical information exchange and management
(Conc 17/14)

Establish, as a matter of urgency, a standard model for the electronic exchange of aeronautical information;
(Action by: ICAO Headquarters ANB/AIS/MAP)

Advise States of the Asia and Pacific Regions to await the outcome of that work, which is expected to be completed in 2007.
(Action by: Regional Office, Bangkok)

Additional Asia/Pacific Office ATM Resources
(Conc 17/18)

Address, as a matter of urgency, the issue of ATM resources at the Bangkok Regional Office.
(Action by: ICAO Headquarters ADB/ HRB)

Special Implementation Project to assist rectification of Deficiencies
(Conc 17/51)

Consider establishing a SIP during 2007 to assist in the rectification of identified operational safety deficiencies in a group of States of the Asia and Pacific Regions
(Action by: ICAO Headquarters RAO)

2.4 In regard to action by the ICAO Council, in accordance with the revised established practice (C-DEC 177/14, 20 March 2006 refers), PIRG reports would not be presented to the Council unless the Commission deemed it necessary for the Council to take action on any of the conclusions. In the case of the APANIRG/17 Report, as there were no specific items that required Council action the Commission did not submit the report to the Council.

Review of outstanding Conclusions and Decisions of APANPIRG

2.5 The meeting reviewed and updated the list of outstanding Conclusions and Decisions of APANPIRG meetings prior to APANPIRG/16 (August 2005) with respect to ATM/AIS/SAR issues, as shown at **Appendix B** to the Report on Agenda Item 2. The meeting also reviewed and updated the list of outstanding Conclusions and Decisions from the last APANPIRG meeting, APANPIRG/17 (August 2006), with respect to ATM/AIS/SAR issues, as shown at **Appendix C** to the Report on Agenda Item 2.

2.6 The updated lists of APANPIRG Conclusions and Decisions will be presented to APANPIRG/18, to be held from 3 to 7 September 2007.

**EXTRACTS FROM THE AIR NAVIGATION COMMISSION REVIEW OF THE
APANPIRG/17 REPORT AS CONTAINED IN AN-WP/8183
RELATED TO THE ATM/AIS/SAR/SG**

AN-WP/8183

Appendix

2.2 Air traffic management (Agenda Item 2.1)

2.2.1 *RVSM height monitoring:* The WG noted the views of APANPIRG that the current requirements for ongoing height-keeping performance monitoring differed from region to region. This meant that operators were required to meet different requirements because of their geographical area of operation. In this regard, the WG noted that the Secretariat, through the Separation and Airspace Safety Panel (SASP), has already commenced working on the task of developing globally harmonized long-term height-keeping monitoring requirements as opposed to the current regional approach (Conclusion 17/4 refers). Additionally, a meeting of the Regional Monitoring Agencies (RMAs) is being planned in follow-up of Conclusion 5/12 (Coordination between RMAs) of the fifth meeting of the All Planning and Implementation Regional Group (ALLPIRG/5).

2.2.2 *South China Sea:* The WG noted with concern that, in the South China Sea area, the RVSM target level of safety was not being satisfied and that it exhibited an adverse trend (Decision 17/5 refers). It was also noted that no horizontal safety assessment for the parallel route structure had been conducted since its implementation in 2001 (Conclusion 17/6 refers). The WG was informed that the Secretariat was monitoring the progress on the follow-up action initiated by APANPIRG.

2.2.3 *Conditional ATS routes:* The WG was pleased to learn that civil-military coordination had produced satisfactory results (Conclusion 17/7 refers). The WG, while recognizing the importance of these conditional routes, was of the opinion that there already exists adequate guidance in Annex 11 — *Air Traffic Service*, Appendix 1, paragraph 2.2.1, c) and d) in reference to the designator for routes that do not form part of regional networks. The WG, in its discussions, also noted that routes through special use airspace were already implemented in many other States using the nomenclature of Annex 11 and was of the opinion that no further action on Conclusion 17/8 was required by ICAO in this regard.

2.2.4 *Regional performance framework:* The WG complimented APANPIRG for initiating the development of the regional performance framework (Conclusion 17/10 refers), recognized its value, and, therefore, recommended that the Commission request the Secretary General to extend this approach to the remaining PIRGs and also review and align the planning methodologies of PIRGs to facilitate integration into the ANIP in support of the Business Plan.

2.2.5 *Contingency plan:* The WG took note of the completion of the contingency plans of the Jakarta and Ujung Pandang flight information regions (FIRs) of Indonesia. In reviewing the plan, the WG noted that the format followed closely the contingency plan format sent to Regional Offices as a model for ICAO States in early 2006. In this context, the WG concurred with the APANPIRG Conclusion 17/11 proposing that the Jakarta model be adopted by other Asia/Pacific States in the preparation of their national air traffic management (ATM) contingency plans.

2.2.6 *Language proficiency:* The WG noted that APANPIRG discussed the issues and challenges of implementing language proficiency provisions (paragraphs 2.1.96 to 2.1.101 of the Meeting Report refer) and made a reference to the survey undertaken in December 2005. Recalling that the replies to the survey were not comprehensive, the WG recommended that the Commission request the Secretary General to urge States to provide information, during the next meetings of PIRGs, on the difficulties experienced in the implementation of the language proficiency provisions.

2.2.7 *Aeronautical information exchange model:* With regard to Conclusion 17/14, the WG noted that the work of defining the global data model for aeronautical information interchange was already in progress by the Secretariat and consequently recommended that the Commission invite the Secretary General to advise States of the Asia and Pacific Regions to await the outcome of that work, which is expected to be completed in 2007.

2.2.8 *Additional Asia and Pacific Office ATM resources:* The WG noted that APANPIRG had expressed concern about the lack of resources in the Bangkok Regional Office, in particular with regard to the air traffic management (ATM) officers (Conclusion 17/18 refers). In the interim, the WG was informed that an ATM officer from the Government of Thailand had been seconded to the ICAO Asia and Pacific Regional Office. Acknowledging that implementation of the air navigation systems and procedures was of the utmost importance, the WG recommended that the Commission request the Secretary General to urgently address the issue of ATM resources at the Bangkok Regional Office.

2.5 **Other air navigation matters (Agenda Item 2.4)**

2.5.1 *Funding for RMAs:* On the matter of funding arrangements for regional safety monitoring mechanisms, the WG noted that APANPIRG has formed a task force to develop and distribute to States, by 30 June 2007, implementation proposals for the establishment of Regional Airspace Safety Monitoring Committees and would take into account the recently finalized related ICAO guidance material (Decision 17/47 refers) by ALLPIRG/5 and the sixth meeting of the Air Navigation Services Economics Panel (ANSEP/6).

2.5.2 Meanwhile, the WG noted that the United States Federal Aviation Administration (FAA) would continue to be the service provider of the Central Reporting Agency (CRA) and Regional Monitoring Agency (RMA) services for the Pacific Region (with the exception of CRA services for Japan) until more formal arrangements have been made. It was further noted that all the Pacific States using these FAA services will commit to reimburse the FAA effective 30 June 2007, failing which these services would be at risk of being suspended.

2.7 **Deficiencies in the air navigation field (Agenda Item 4)**

2.7.1 *Operational safety deficiencies:* Regarding deficiencies, the WG noted that APANPIRG had reviewed, analysed and prioritized the list of air navigation deficiencies. The WG supported Conclusion 17/51 which called upon ICAO to establish a special implementation project (SIP) with the objective of mitigating identified operational safety deficiencies in a group of States in the Asia and Pacific Regions with the understanding that the normal process for approval of that SIP would be followed. In the meantime, the WG noted that the SIP would specifically address difficulties with air/ground and ground/ground communications, poor ATC practices and non-compliance with Annex 10 — *Aeronautical Telecommunications*, Annex 11, Annex 14 — *Aerodromes* and Annex 15 — *Aeronautical Information Services* and is expected to cover three States.

2.7.3 *Action plans for deficiencies:* The WG was pleased to note that the APANPIRG has accorded highest priority in its future work programme to the urgent elimination of the safety-related deficiencies in the Region. States reflected in the APANPIRG list of deficiencies had been urged to establish action plans with fixed target dates by mid-2007. Also, commitment to the elimination of deficiencies should be pursued through all available mechanisms, including the Annual Conference of the Directors General of Civil Aviation (Conclusion 17/54 refers).

STATUS OF OUTSTANDING CONCLUSIONS/DECISIONS OF APANPIRG IN ATM/AIS/SAR FIELDS

(Changes recommended by ATM/AIS/SAR/SG/17 and APANPIRG/17 in ~~redline~~ and ~~strikeout~~. Items closed by APANPIRG/16 removed from the list)

Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
C-10/4		Implementation of Area Control Service and 10 Minute Longitudinal Separation using Mach Number Technique in the Bay of Bengal area 1) ~~That, States in the Bay of Bengal area~~ a) ~~Complete the upgrade of airspace from advisory and flight information services to area control service along ATS routes, as appropriate;~~ b) ~~identify ATS routes where 10 minute longitudinal separation minima for RNAV equipped aircraft without using MNT could be applied and implement such minima.~~ 2) ~~That, Sub regional ATS Co-ordination Groups concerned place a high priority on items 1) a), and b) above.~~ ~~India reported to ATM/AIS/SAR/SG/17 that to improve HF operation over Mumbai FIR India has initiated several steps such as sectorization of HF AMS with adequate frequency compliment, shifting of HF receivers to remote place and providing OFC connectivity to ATS complex and providing a digital media between transmitting station and ATS complex etc. These steps have resulted in significant increase in number of contacts and hence substantial improvement in HF operation in Mumbai FIR. Moreover with the deployment of ADS/CPDLC at Mumbai, dependency on HF communication has reduced. Notwithstanding the above, India is seeking help from external expert agencies to progressively improve the performance of HF Communication in Indian Airspace further.~~ ~~The improved HF arrangements had been verified by ICAO CNS mission to Mumbai during early 2007.~~	India issued NOTAM during 2006 regarding sectorisation plan for HF radio channels in the Arabian Sea area of Mumbai FIR. Three HF frequencies allocated to reduce congestion a) ~~Some routes in the Mumbai FIR remain under advisory service due to inadequate communications which is being remedied~~ Note: LOAs of some States require updating. The Regional Office to coordinate b) ~~Implementation subject to provisions of ICAO separation standards.~~ 2) ~~Implementation continues to be co-ordinated through the Bay of Bengal ATS Co-ordination Group (BBACG).~~ ~~BBACG/17 & BBACG/18 informed of enhancements in routes and services as well as commissioning of datalink equipment. In view of continuing improvements in communications and routes, recommend Closed.~~	On-going On-going On-going Recommend "Closed"

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
€ 13/34		~~Strengthening the Civil/Military Coordination Programme~~ ~~That, due to an increase in military activity within and adjacent to the Asia/Pacific Region,~~ ~~1. States are urged to:~~ ~~a) remain vigilant with regard to military activity within or near their area of responsibility;~~ ~~b) continue effective civil/military coordination with military authorities concerned; and,~~ ~~c) advise and coordinate with adjacent States and ICAO of any significant increase in military activity which may have an affect on international aircraft operations.~~	~~States are encouraged to strengthen activities in this area~~ ~~States are encouraged to strengthen activities in this area~~ ~~States are encouraged to strengthen activities in this area~~ ~~Note: APANPIRG/16 raised Conclusion 16/17 in respect of the equitable sharing of airspace and facilities, and Decision 16/16 to include Civil Military Coordination on the Agendas of ATS Coordination Groups. Both were actioned during 2005/2006.~~ ~~APANPIRG/16 tasked Regional Office to issue State Letter highlighting the concerns in a), b), and c)~~	~~Closed~~ ~~Closed~~ ~~Closed~~ ~~Completed~~ ~~Closed~~

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
C14/9		AIRAC provisions That, ICAO be requested to again reinforce to States the critical safety nature of AIS and adherence to Annex 15 provisions, particular those relating to AIRAC, as well as the need to ensuring accurate and timely publication of AIS data.	The AIS Implementation Task Force (AIS/TF) to undertake a study of the application of Annex 15 requirements by the end of 2005- 2007 First meeting of AIS Task Force (AITF/1) held 20-24 March 2006, second meeting to be scheduled in March 2007 ATM/AIS/SAR/SG/16 raised draft Conclusion 16/5 proposing that the attention of States be drawn to the continued relevance of C14/9	On-going Closed Superseded by Decision 17/17
C15/8	ANC	Implementation of a 2 NM lateral offset procedures in the ASIA/PACIFIC Region That, States in the Asia/Pacific Region implement the 2 NM lateral offset procedures to the right of centre line in accordance with ICAO guidance on a common AIRAC date to be coordinated by the ICAO Regional Office with States, ATS Coordination Groups and users concerned. <i>Noted the conclusion and called upon the Secretary General to monitor its progress, recalling that revised guidelines on the use of strategic lateral offsets, as approved by the Commission, had recently been circulated to States and that global provisions were under development.</i>	Generally implemented by affected APAC States on AIRAC 20 January 2005 and 17 March 2005. Other States advised to consider implementation. Note: APANPIRG/16 incorporated Conclusion 14/7 into Conclusion 15/8 and closed Conclusion 14/7. The following text was incorporated from Conclusion 14/7: <i>Based on the ICAO revised guidelines, States to promulgate in State AIPs the routes and airspace where offsets are authorized as</i>	On-going Completed

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
			<i>required by Annex 2 (Chapter 3, 3.6.2.1.1).</i> Widespread AIP implementation in the vast majority of affected airspaces	Completed
D15/46		Implementation of AN Conf/11 (November 2003) 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	Included on ATM/AIS/SAR Sub-Group and CNS/MET Sub-Group Task Lists; reviewed by the Sub-Groups. To be further reviewed by Sub-Groups during 2007. Attachment added to Sub Group Task list by ATM/AIS/SAR/SG/17 to enable continued visibility of these issues	On-going Recommend "Closed"
C16/15	€	Special Implementation Project for Development of a State Contingency Plan That, in order to provide a model for States of the Asia/Pacific Region in preparing their national contingency plans, ICAO undertake a special implementation project (SIP) during 2006 to assist a State of the Region to prepare and implement a contingency plan in accordance with Annex 11, Appendix D, and in line with APANPIRG Conclusion 13/8. The SIP should also identify and prioritize other contingency circumstances that may affect civil aviation operations in the ATM context and make recommendations accordingly. <i>Noted the conclusion and that the project would be submitted for the Council's approval through established procedures.</i>	SIP proposal prepared by Regional Office and approved by Council of ICAO. SIP field visits conducted July 2006 in Indonesia. Draft contingency plan with Indonesia for review. SIP mission conducted in Indonesia during June 2006. Contingency plans for Jakarta and Ujung Pandang FIRs prepared and authorised by Indonesian authorities in April 2007. Copies of plans	On-going Recommend "Completed" 2

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
			circulated as model for Asia/Pacific States in accordance with Conclusion 17/11. Regional Office State Letter Ref.: T3/4.9 – AP021/07 (ATM) of 21 Jan 2007 refers The ANC took note of the completion of the contingency plans of the Jakarta and Ujung Pandang flight information regions (FIRs) of Indonesia. In reviewing the plan, the ANC noted that the format followed closely the contingency plan format sent to Regional Offices as a model for ICAO States in early 2006. In this context, the ANC concurred with the APANPIRG Conclusion 17/11 proposing that the Jakarta model be adopted by other Asia/Pacific States in the preparation of their national air traffic management (ATM) contingency plans.	
C16/18		Assistance to States to develop safety management systems That, recognizing that many States in the Asia/Pacific Region require assistance to implement safety management programmes in accordance with Annex 11, States with expertise in implementing and operating ICAO compliant safety management systems inform ICAO by end of 2005 of their willingness to participate in a series of seminars/workshops to be arranged by ICAO during 2006-2007 to assist States.	Regional Office coordinating with CAD Hong Kong China for conduct of ATS Safety Management Workshop during first quarter 2007 SIP proposal for additional ATS SMS training via field visits was developed by	On-going Recommend “Completed”

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
			Regional Office and approved by Council of ICAO, for implementation in last quarter 2006. SIP requires participation of one fully funded State safety management expert to assist No assistance from fully funded State personnel available so SIP SMS Workshop using modified proposal conducted 25-29 September 2006 at the Regional Office Overtaken by event. Ongoing ICAO HQ SMS training in place.	
C16/19		Study of States' preparedness to implement safety management systems That, a study of States' preparedness to implement ICAO safety management systems in accordance with Annex 11 be undertaken by the Asia/Pacific Regional Office in conjunction with the ATS coordination groups and RASMAG by the first quarter of 2006, and a plan of action developed to be reported to APANPIRG/17 in September 2006.	Coordination with States in process. However SIP proposal for additional ATS SMS training via field visits was developed by Regional Office and approved by Council of ICAO, for implementation in last quarter 2006. SIP requires participation of one fully funded State safety management expert to assist.	On-going

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
C16/23		Special Implementation Project International Seminar and SAREX That, ICAO consider a proposal for an Asia/Pacific Special Implementation Project to be established with the primary objective to improve search and rescue services, coordination and cooperation between island States of the Pacific.	SIP proposal prepared by Regional Office and approved by Council of ICAO. SIP proposed for deferral to first quarter 2007 to align with other SAR activities planned for Pacific involving other international agencies. SIP SAR Workshop using modified proposal conducted 26 February – 2 March 2007 at the Regional Office	On-going Recommend “Completed”
D16/59		Review of the Regional Plan for the New CNS/ATM System That, the CNS/MET, ATM/AIS /SAR Sub-groups and RASMAG be tasked to review the Global Air Navigation Plan for the CNS/ATM System and the ASIA/PAC Regional Plan for the New CNS/ATM system with a view to avoiding any duplication with the updated Global Plan. The work should commence immediately after issuance of new edition of the Global Plan.	Second Amendment to the Global Plan not yet published, expected late 2006. APANPIRG/17 established a task force (Dec 17/10) to conduct this review. Regional Performance Framework Task Force has not yet met.	On-going

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Report Reference ----- Conc/Dec No	Action by ANC/ Council	Decision/Conclusion Title/ ANC/Council Action, if any	Action by States/ICAO	Status
~~C16/61~~		UAV Operation ~~That, ICAO develop, as a priority, appropriate provisions and guidance material for the operation of UAV.~~	UAV Exploratory meeting held at ICAO HQ in May 2006. ATM/AIS/SAR/SG/16 did not consider intent of C16/61 had been met and raised additional draft Conclusion re UAV for consideration. During mid 2007 ANC has established Unmanned Aircraft Systems Study Group (UASSG) to progress these matters	On-going Recommend "Closed"

**APANPIRG/17 Conclusions/Decisions — Action Plan
(Matters Related to the ATM/AIS/SAR/SG)**

(Changes recommended by ATM/AIS/SAR/SG/17 in redline and ~~strikeout~~)

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
D 17/1 A , D	Implementation of ALLPIRG/5 conclusions by APANPIRG	That the following conclusions of ALLPIRG/5 be studied by the concerned subgroups, that action be taken to implement them and that the outcome be presented to ensuing APANPIRG meetings: ~~— Conclusions 5/2, 5/4, 5/5, 5/7, 5/8, 5/9, 5/11, and 5/13: ATS/AIS/SAR/SG;~~ — Conclusions 5/2, 5/4, 5/5, 5/13, 5/16, and 5/17: CNS/MET/SG; — Conclusions 5/14, 5/15: DRTF	Allocate responsibility to contributory bodies Identify projects for implementation Relevant Conclusions from ALLPIRG/5 presented to ATM/AIS/SAR/SG/17 for action. Copy of full text of relevant Conclusions included with ATM/AIS/SAR Task List for ease of reference Recommend “Closed” in terms of Concs allocated to ATM/AIS/SAR/SG	APANPIRG — ATM/AIS/SAR SG — CNS/MET SG — DRTF	Decision Updated work programmes of sub-groups and other contributory bodies Implementation projects	Aug 2006 July 2007

TBD = To be determined

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Appendix C to the Report on Agenda Item 2

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/4 D	Long Term Monitoring of RVSM Height Keeping Performance	That, in recognition of the desirability of global harmonization and interoperability, ICAO be invited to consider appropriate measures to ensure that any requirements for long term monitoring of RVSM height keeping performance be standardized and applied on a global basis.	Develop requirements for long term monitoring of height keeping performance SASP WHG/11 meeting May/June 2007 agreed on a statement of such requirements for submission to the Air Navigation Commission for adoption. Recommend “Closed” as matter subject to HQ action.	ICAO HQ	Appropriate provisions	TBD

TBD = To be determined

ATM/AIS/SAR/SG/17
Appendix C to the Report on Agenda Item 2

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~D-17/5~~ A	Establishment of WPAC/SCS RVSM Scrutiny Working Group	Recognizing that: ~~a) incompatibilities exist between the modified single alternate flight level orientation scheme (FLOS) in use in the Western Pacific/South China Sea (WPAC/SCS) area and the single alternate FLOS in use in areas adjacent to the WPAC/SCS area, and~~ ~~b) the RVSM Target Level of Safety in the WPAC/SCS area was not being satisfied and exhibited an adverse trend,~~ ~~a Scrutiny Working Group be established to identify, study and address problems in the safety, efficiency and harmonization of WPAC/SCS RVSM operations in accordance with the Terms of Reference in Appendix A to the Report on Agenda Item 2.1.~~	Creation of WG Conduct WG meeting Follow work programme established with TORs Scrutiny Group established, WPAC/SCS RSG/1 meeting Jan/Feb 2007, WPAC/SCS RSG/2 meeting June 2007. Although TLS still exceeded, actions by States since RSG/1 has reversed adverse trend. Scenario 3 single alternate FLOS reached in principle agreement, under final study by States. Recommend “Closed” as WPAC/SCS RSG has been established	APANPIRG Regional Office WG	TORs WG Report Report to APANPIRG/18	Aug 2006 Feb 2007 Aug 2007

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/6 A	Completion of the horizontal safety assessment for the South China Sea route structure	That, recognizing that no horizontal safety assessment for the South China Sea parallel route structure had been conducted since implementation in 2001, the ICAO Regional Office urges concerned States to complete, by 30 June 2007, a horizontal safety assessment in accordance with ICAO ATS safety management provisions.	Urge States concerned Conduct safety assessment Thailand completed safety assessment on behalf of affected States. Result inconclusive as more traffic movement data required, however RASMAG/7 (June 2007) consider no evidence of any reason for concern. Safety assessment to be repeated in 12/18 months time. Recommend "Completed"	Regional Office States concerned	State letter Safety assessment report	Oct 2006 30 June 2007
C 17/7 D	Implementation of Conditional ATS Routes	That, recognizing the valuable practical examples established by recent regional implementations of enhanced ATS route segments in which the hours of operation, flight levels available and other parameters were subject to operating conditions, the ICAO Regional Office urges States to implement conditional ATS routes and route segments. <i>Note: Related to Global Planning Initiative # 1 (GPI-1) Flexible use of airspace</i>	Urge ASIA/PAC States to implement Regional Office transmitted State Letter Ref: in this regard. Recommend "Closed" .	Regional Office	State letter	Dec 2006

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/8 D	Definition of Conditional ATS Route and ATS Designator	~~That, noting that States were addressing Global Planning Initiative #1 (<i>Flexible use of airspace</i>) by the increasing implementation of ATS route segments that were subject to restricted operational conditions in terms of hours/days of operation, usable flight levels available and/or other parameters, ICAO be invited to consider promulgating a definition of conditional ATS routes and an appropriate ATS route designator.~~	Develop definitions The ANC, while recognizing the importance of these conditional routes, was of the opinion that there already exists adequate guidance in Annex 11 — <i>Air Traffic Service</i> , Appendix 1, paragraph 2.2.1, c) and d) in reference to the designator for routes that do not form part of regional networks. The ANC also noted that routes through special use airspace were already implemented in many other States using the nomenclature of Annex 11 and was of the opinion that no further action on Conclusion 17/8 was required by ICAO. Recommend “Closed”	ICAO HQ	Appropriate provisions	TBD

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~C 17/9~~ ~~A, D~~	~~Coordination of UAV Procedures Development~~	~~That, noting the serious concerns held by some States of the Asia/Pacific Region in respect of Unmanned Aerial Vehicle (UAV) operations in mixed environments, ICAO invite Australia, India, Japan, Malaysia, New Zealand and Singapore to participate in the Informal ICAO Working Group on UAVs.~~	~~Invite concerned States to participate.~~ ~~ANC has established Unmanned Aircraft Systems Study Group (UASSG) to progress these matters.~~ ~~Recommend "Closed"~~	~~ICAO HQ~~	~~Invitation letter~~	~~TBD~~
D 17/10 D	Establish APANPIRG Regional Performance Framework Task Force	That, recognizing the new regional planning methodologies precipitated by the second amendment to the Global Air Navigation Plan and the new ICAO business planning requirements, a Task Force be established to develop a proposal/framework for consideration by APANPIRG/18 for incorporating the performance based approach into the work programme of APANPIRG and its contributory bodies. The Terms of Reference of the Task Force are provided in Appendix B to the Report on Agenda Item 2.1.	Creation of TF Teleconference Follow work programme established with TORs No opportunity to convene this Task Force so far.	APANPIRG TF TF	TOR TF Report Regional performance framework Report to – ATM/AIS/SAR/17 – CNS/MET/11 – APANPIRG/18	Aug 2006 Dec 2006 May 2007 June 2007 July 2007 Aug 2007

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~C-17/11~~ A	~~Adoption of Model~~ National ATM Contingency Plan	~~That the National ATM Contingency Plans of Jakarta and Ujung Pandang FIRs, which were prepared as a result of the 2006 ICAO Special Implementation Project be adopted as a model for Asia/Pacific States in the preparation of national ATM contingency plans.~~	~~Adopt model contingency plan and distribute to States~~ Contingency plans for Jakarta and Ujung Pandang FIRs prepared and authorised by Indonesian authorities in April 2007. Copies of plans circulated as model for Asia/Pacific States in accordance with Conclusion 17/11. Regional Office State Letter Ref.: T3/4.9 – AP021/07 (ATM) of 21 Jan 2007 refers. Recommend “Closed”	~~Regional Office~~ States	~~State letter~~ Implement Model Contingency Plan	~~Dec 2006~~ TBD

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~C 17/12~~ ~~A, D~~	~~Compliance with ATFM Operational Trial procedures~~	That, recognizing the safety and efficiency benefits resulting from the implementation of effective air traffic flow management across the Bay of Bengal, South Asia and Pakistan through the Kabul FIR, the ICAO Regional Office request States and airspace users concerned, subject to safety considerations/enroute restrictions, to ensure: a) full compliance with the current ATFM Operational Trial procedures, and b) affected ANSPs to take action to ensure that flights enter Kabul FIR in accordance with the slot parameters (flight level, ATS route and entry fix time) allocated to each flight.	Urge States concerned State Letter Ref.: T3/8.13.2-AP115/06 (ATM) of 12 December 2006 refers Ensure compliance with ATFM Trial Procedures Flights enter Kabul FIR in accordance with the slot parameters ATFM/TF/10 (30 Apr-3 May 2007) took 'Go' decision for implementation of ATFM procedures on 5 July 2007 based on improvements to ANSP and airline performance. Recommend "Completed"	Regional Office States concerned, ANS Providers Concerned ANSPs	State letter Notify Regional Office of compliance with ATFM procedures Notify Regional Office of compliance with slot parameters	Sept 2006 Dec 2006 Dec 2006

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~D 17/13~~ D	Reconvening of the AIDC Task Force	That the AIDC Task Force be reconvened for a single meeting to complete the outstanding task of defining the format of the FAN message and addressing other outstanding issues identified in the Asia/Pacific Regional Interface Control Document for ATS Inter Facility Ground/Ground Data Communications Version 2.0.	Conduct meeting Complete the specified tasks AIDC Task Force met 6-9 Feb 2007 and prepared Version 3 Asia/Pacific AIDC ICD for adoption by APANPIRG/18 ~~Recommend "Completed"~~	Regional Office, AIDC TF	Report to = ATM/AIS/SAR SG/17 = CNS/MET SG/11	July 2007
C 17/14 D	Improvement of aeronautical information exchange and management	That, in order to increase the reliability and integrity of the aeronautical information in support of navigation functions, ICAO be invited to establish, as a matter of urgency, a standard model for the electronic exchange of aeronautical information.	Establish a standard model for the electronic exchange of aeronautical information HQ response – ICAO to establish, as a matter of urgency, a standard model for the electronic exchange of aeronautical information; HQ response - Advise States of the Asia and Pacific Regions to await the outcome of that work, which is expected to be completed in 2007.	ICAO HQ	Appropriate provisions	TBD

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
D 17/15 D	Terms of Reference of the AIS Implementation Task Force	~~That, the AIS Implementation Task Force be directed to report to the ATM/AIS/SAR Sub-group and the Terms of Reference be amended accordingly.~~	Amend TOR AITF Terms of Reference amended Recommend "Completed"	Regional Office	Amended TORs	Aug-06
C 17/16 A, D	Conduct of Comprehensive Regional AIS Survey	~~That, recognizing that GPI 18 – <i>Aeronautical Information</i> requires real-time availability of quality assured electronic information (aeronautical, terrain and obstacle), the AITF, in conjunction with the Regional Office, conduct a comprehensive survey of all Asia/Pacific States in relation to AIS matters, including details of status in relation to the automation of dynamic data, automation of static data and availability of electronic terrain and obstacle data.~~	Conduct Regional Survey on AIS Matters Regional survey conducted, results reported to ATM/AIS/SAR/SG/17 Recommend "Completed"	AITF Regional Office States to provide input	Questionnaire for survey State letter Survey replies	June 2007 1Q 2007 1Q 2007
C 17/17 D	Non-Compliance with Annex 15 provisions	That, noting the regular and ongoing non-compliance with Annex 15 – <i>Aeronautical Information Services</i> provisions in respect to AIRAC notification periods, the ICAO Regional Office be requested to reinforce to States the critical safety nature of AIS and adherence to Annex 15 provisions, particularly those relating to AIRAC periods, as well as the need to ensuring accurate and timely publication of AIS data.	Urge States to comply with Annex 15 ATM/AIS/SAR/SG/17 raised appropriate draft Conclusion for consideration by APANPIRG/18	Regional Office	State letter	Jan 2007

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/18 D	Additional Asia/Pacific Office ATM Resources	That, in consideration of the significant actual and forecasted traffic growth in Asia/Pacific Region and the benefits to be gained from the APANPIRG CNS/ATM work programme through implementing the Global Plan Initiatives:				
		a) ICAO be requested to urgently address the inadequacy of ATM resources at the Regional Office; and b) ASIA/PAC States be requested to consider possibilities of further supporting the Regional Office ATM programme.	Consider establishment of additional ATM Officer Consider support to ATM programme	ICAO HQ States	Creation of post Proposals for support	TBD Aug 2007
~~D 17/19~~ ~~A, D~~	~~ATM/AIS/SAR Subject/Task List~~	~~That the ATM/AIS/SAR Subject/Task List as contained in Appendix I to the Report on Agenda Item 2.1 be adopted as the current work programme for the ATM/AIS/SAR Sub Group.~~	~~Adopt work programme~~ ~~Adopted,~~ ~~Recommend “Completed”~~	~~APANPIRG~~	~~ATM/AIS/SAR Subject/Task List~~	~~Aug 2006~~

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/43 D	Development of provisions on MET/ATM coordination	That, in recognizing the importance of the meteorological support for the air traffic management,				
		a) ICAO Regional Office conduct a survey of the evolving requirements for meteorological information and services in support of air traffic management; and	Conduct survey	MET/ATM TF, Regional Office	Questionnaire for the survey	1Q 2007
		b) the results of the survey above, be referred to the appropriate ICAO body in view of potential extension of the existing provisions on the meteorological services for ATS, to cover the other ATM fields.	Develop SARPs Draft Survey developed during 2007, reviewed by ATM/AIS/SAR/SG/17 and CNS/MET/SG/11. Survey will be circulated following incorporation of feedback	ICAO HQ	Survey Report to be presented to – ATM/AIS/SAR/17 – CNS/MET/11 Appropriate provisions	Jun 2007 TBD
D 17/47 A	Task Force to establish Regional Airspace Safety Monitoring Committees	That a Task Force be established to develop and distribute to States by 30 June 2007 implementation proposals for the establishment of Regional Airspace Safety Monitoring Committees (RASMC). The Task Force would work in accordance with the terms of reference in Appendix A to the Report on Agenda Item 2.4 and use, <i>inter alia</i> , recent ICAO guidance materials in relation to the global approach for the funding of airspace safety monitoring.	Establish TF Develop proposal for RASMB First meeting of RASMC/TF held 13-15 Feb 2007. RASMAG/7 proposed amendments to TOR of RASMC/TF for consideration by APANPIRG/18	APANPIRG TF	TOR Report to RASMAG	Aug 2006 May 2007

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~C-17/48~~ A	~~Funding of Pacific RMA & CRA~~	In recognizing that the United States/FAA was the current service provider of CRA and RMA services for the Pacific Region (with the exception of CRA services for Japan), it was acknowledged that: a) ~~FAA would remain the interim service provider for the Pacific Region until more formal arrangements have been made, and~~ b) ~~Pacific States using these FAA services commit to reimburse the FAA for those CRA and RMA services rendered effective 30 June 2007.~~ <i>Note: The FAA will be formally notifying each of these individual states that if reimbursement agreements are not in place by 30 June 2007, these services are at risk of being suspended.</i>	Acknowledge service provision Provide service Commit to reimburse ~~RASMAG/7 advised that analysis by USA indicates that use of bi-lateral agreements is cost prohibitive. USA will continue to fund existing arrangements until a long term solution can be implemented. Recommend "Closed"~~	APANPIRG USA States concerned	Decision that FAA would remain the interim service provider for the Pacific Region Service provider for the Pacific Region Reimbursement agreement	Aug 2006 Ongoing 30 June 2007
~~C-17/51~~ A	~~Special Implementation Project to assist rectification of Deficiencies~~	~~That in order to facilitate mitigating action in relation to identified operational safety deficiencies in a group of States in the Asia/Pacific Region, ICAO undertake a special implementation project during 2007. The SIP would address difficulties with air/ground and ground/ground communications, poor ATC practices and non-compliances with Annexes 14 and 15.~~	~~Establish and conduct SIP.~~ ~~SIP conducted to Nepal (CNS) and Bangladesh (ATM + CNS) during May/June 2007. Recommend "Closed"~~	Regional Office ICAO HQ	SIP proposal SIP establishment	Jan 2007 March 2007

TBD = To be determined

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Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
C 17/53 A	A regional on-line database of air navigation deficiencies in ASIA/PAC Region	That, in order to ensure transparency and facilitate resolution of deficiencies, ICAO Regional Office be invited to establish a regional on-line database of air navigation deficiencies and provide secure access to States' Administrations and other users concerned.	Establish on-line database Work to build database has progressed, Regional Office will brief DRTF/3 and APANPIRG/18 on progress.	Regional Office, DRTF, ICAO HQ	On-line database	Aug 2007
C 17/54 A	Deficiency resolution objective for ASIA/PAC States	That, a) all ASIA/PAC States listed in the APANPIRG List of deficiencies be urged to establish action plans with fixed target dates for resolution of all safety related deficiencies and inform ICAO Regional Office by mid 2007 of their plans; and b) the need for urgent action in resolving safety related deficiencies be brought to the attention of DGCA/43 conference in December 2006.	Establish action plans Report to DGCA 43 rd DGCAs adopted Action Item 43/1 in this respect.	States Regional Office	Action plan DP for DGCA	June 2007 Dec 2006

TBD = To be determined

ATM/AIS/SAR/SG/17
Appendix C to the Report on Agenda Item 2

Concl/Dec No. --- Strategic Objective*	Title of Conclusion/ Decision	Text of Conclusion/Decision	Follow-up Action	To be initiated by	Deliverable	Target date
~~D~~ 17/55 A	~~Third meeting of~~ DRTF	~~That, the deficiency review task force (DRTF) conduct a meeting in early 2007 with the following tasks:~~ a) ~~develop appropriate follow up action to ALLPIRG Conclusions 5/14 and 5/15;~~ b) ~~review the implementation aspects of the regional supplement to the Uniform Methodology including an assessment of the current List of Deficiencies; and~~ e) ~~report to APANPIRG/18~~	Conduct meeting and act on a), b) and c): Meeting held 23-25 July 2007, reviewed ALLPIRG/5 Conclusions and implementation of APAC Supplement, and prepared report for APANPIRG/18 Recommend "Completed".	Regional Office, DRTF	DRTF/3 Report Report to sub-groups and APANPIRG/18 Database format document	Mar 2007 Jun, Jul, Aug 2007 Aug 2007

* **Note:** ICAO has established the following Strategic Objectives for the period 2005-2010:

A: Safety - Enhance global civil aviation safety; **B: Security** - Enhance global civil aviation security; **C: Environmental Protection** - Minimize the adverse effect of global civil aviation on the environment; **D: Efficiency** - Enhance the efficiency of aviation operations; **E: Continuity** - Maintain the continuity of aviation operations; **F: Rule of Law** - Strengthen law governing international civil aviation.

TBD = To be determined

**AGENDA ITEM 3: REVIEW AND PROGRESS THE
TASKS ASSIGNED TO THE
ATM/AIS/SAR/SG BY APANPIRG**

Agenda Item 3: Review and progress the tasks assigned to the ATM/AIS/SAR/SG by APANPIRG

APANPIRG/17 Review of ALLPIRG/5

3.1 APANPIRG/17 was informed of the results of the fifth meeting of the ALLPIRG (ALLPIRG/5, March 2006) and noted that ALLPIRG/5 had developed 18 Conclusions encompassing a wide range of issues. A copy of the full report of the ALLPIRG/5 is available from <http://www.icao.int/index.html>.

3.2 As a result of analysis of the conclusions of ALLPIRG/5, APANPIRG/17 identified those conclusions which required follow-up by APANPIRG and assigned the task to the relevant Sub-groups. Accordingly, Decision 17/1 below was formulated by APANPIRG/17: APANPIRG/17 also called upon States and International Organizations to take follow-up action on conclusions that were relevant to them.

Decision APANPIRG 17/1 - Implementation of ALLPIRG/5 conclusions by APANPIRG

That the following conclusions of ALLPIRG/5 be studied by the concerned subgroups, that action be taken to implement them and that the outcome be presented to ensuing APANPIRG meetings:

- Conclusions 5/2, 5/4, 5/5, 5/7, 5/8, 5/9, 5/11, and 5/13: ATS/AIS/SAR/SG
- Conclusions 5/2, 5/4, 5/5, 5/13, 5/16, and 5/17: CNS/MET/SG
- Conclusions 5/14, 5/15: DRTF

3.3 The meeting reviewed the Conclusions from ALLPIRG/5 that had been assigned to the ATM/AIS/SAR Sub-Group, engaging in significant discussions in relation to the matters highlighted. The meeting agreed that the ALLPIRG/5 Conclusions represented a significant body of work that would require significant time and resources to address. However, the meeting expressed that in many instances, component parts of the respective ALLPIRG/5 Conclusions were already in work by the Sub Group and the other ICAO related groups active in the Asia/Pacific Region.

3.4 In relation to Conclusion 5/7 which dealt with environmental issues, the meeting recognized the importance of addressing environmental matters as a high priority and highlighted that implementation of ATM enhancements brought environmental gains as a direct result of the efficiency gains. This was true in virtually all cases, including reduced separation applications such as RVSM and RNP, ATS route realignments, ATFM implementations and so forth.

3.5 The other initiatives required by the ALLPIRG/5 Conclusions were also expected to be fruitful in the longer term. However, pragmatic difficulties existed with initiating and managing actions to address them. The ALLPIRG/5 Conclusions were diverse and required ongoing and regular attention to long term work programmes. The annual meeting intervals adopted by the Sub-Group and APANPIRG were not considered of suitable periodicity to enable swift progress, therefore dedicated work groups would need to be established in some instances. However, as the Regional Office and many States were already experiencing significant resource limitations, the meeting considered that it was unlikely that attempts to create additional work groups would prove a viable way forward.

3.6 In attempting to address APANPIRG Decision 17/1 relating to the study of ALLPIRG/5 Conclusions assigned to the Sub-Group, the meeting adopted the following positions:

- a) Refer the ALLPIRG/5 Conclusions to the Regional Performance Review Task Force that had been established under APANPIRG Decision 17/10, noting that as a result of the resource limitations at the Regional Office the Task Force had not yet been able to be convened;
- b) Recognize that as there had not been action in increasing ATM resources at the Regional Office as required by APANPIRG Conclusion 17/18, work would necessarily be delayed in addressing the ALLPIRG/5 Conclusions;
- c) Recognize that the existing programme of ongoing regional ATM implementations was already resulting in efficiency gains as well as the environmental benefits highlighted by ALLPIRG Conclusion 5/7;
- d) Adopt a perspective for all parties under which all actions, however small, should be taken as opportunities arose;
- e) Acknowledge that the enabling work required by other parties in some instances, including delivery of business case workshops, had not yet taken place in the Asia/Pacific region;
- f) Include the relevant ALLPIRG/5 Conclusions as an attachment to the Task List of the ATM/AIS/SAR/SG to enable continual ease of reference;
- g) Recognize that States primarily held many responsibilities to act unilaterally and bilaterally in moving forward in these matters;
- h) Acknowledge that as a result of the difficulties outlined above, implementation of ALLPIRG/5 Conclusions was likely to be slower than was desirable or originally anticipated; and
- i) Bring these matters to the attention of APANPIRG/18 and seek guidance in accelerating the work programme associated with the ALLPIRG/5 Conclusions.

Review of RVSM Task Force Meetings

3.7 Since reported at the ATM/AIS/SAR/SG/16 (June 2006, Bangkok), the RVSM Task Force (RVSM/TF) had met three times as follows:

- a) 14 - 16 November 2006, Bangkok, Thailand - RVSM/TF/29
(One-Year Review of RVSM Implementation in the Incheon, Naha and Tokyo FIRs);
- b) 12 - 16 March 2007, Bangkok, Thailand - RVSM/TF/30
(China RVSM implementation); and
- c) 15 - 18 May 2007, Beijing, China - Special Coordination Meeting for the RVSM Implementation by China (SCM/RVSM China)
(Review progress made by China)

3.8 The meeting reviewed the outcomes of the RVSM/TF meetings as summarized below.

One-year Airspace Safety Oversight for the RVSM Implementation in Japan and the Republic of Korea

3.9 RVSM/TF/29 reviewed RVSM operations in Japan's domestic airspace and the Incheon FIR since implementation on 29 September 2005, and noted that Japan and the Republic of Korea were satisfied with the smooth implementation and efficient operations.

3.10 Japan informed the meeting that the Japan Civil Aviation Bureau (JCAB) had verified the RVSM approval status of civil (excluding military) aircraft flying in the RVSM airspace (domestic and oceanic) against the RMA databases of the Pacific PARMO, MAAR and EUROCONTROL, and almost 100 percent of the civil flights properly indicated "W" on the flight plan, and 97.6 percent of civil flights were conducted by those aircraft registered on the RMA databases.

3.11 The PARMO had carried out the risk assessment in terms of the technical, operational and overall risk, and the results satisfied the agreed TLS of 2.5×10^{-9} and 5.0×10^{-9} accidents per flight hour respectively.

3.12 As a result of its review, the RVSM/TF confirmed the continued safe and efficient operations in the Japan's domestic airspace and the Incheon FIR.

Implementation of RVSM in China

3.13 At the APANPIRG/17, consideration had been given to disbanding the RVSM/TF as it had completed its schedule of work. However, in view of China's planning to implement RVSM by 2008, APANPIRG/17 considered that the knowledge and experience that had been gained by the RVSM/TF would be useful to China and surrounding States, and would assist in inter-regional harmonization when China proceeded with RVSM implementation. Subsequently, in coordination with the ICAO Regional Office, it was agreed that the RVSM/TF would work with China on RVSM implementation throughout the Chinese FIRs.

3.14 RVSM/TF/30 reviewed the status of China's implementation. In regard to the RVSM flight level allocation system (FLAS) to be implemented by China, this would be in accordance with the China metric system, which would provide a corresponding 1 000 ft separation. The Russian Federation supported the use of the China FLAS, whereby 8,400 m was equivalent to FL280. However, as this FLAS was not in accordance with Annex 2, China, supported by the Russian Federation, intended to submit a proposed amendment to Annex 2, Appendix 3 to ICAO.

3.15 RVSM/TF/30 noted the concerns of some States and international organizations in regard to use of the China metric levels for RVSM and transition procedures that would be required. In this regard, China advised they would hold bilateral meetings with neighboring States to consider amendment of the LOAs and transition issues. RVSM/TF/30 had worked out a table of transition activities listing the Chinese FIRs and its neighboring FIRs.

3.16 In regard to safety and airspace monitoring considerations, the United States Federal Aviation Administration (FAA) Technical Center examined the RVSM FLAS proposed by China using the FAA's Safety Risk Management process. The result of this examination was a safety risk management document (SRMD), which was completed in January 2007, and a draft had been provided to the Air Traffic Management Bureau (ATMB) of the General Administration of Civil Aviation of China (CAAC).

3.17 RVSM/TF/30 agreed that the preliminary safety assessment should be conducted early before the Go/No-Go Meeting in September 2007 so that any safety-related problem could be identified and resolved at an early stage of preparation for RVSM implementation in China. China confirmed that they would be responsible for the safety assessment for RVSM implementation in Chinese airspace. RVSM/TF/30 was informed that the mechanism to collect the required traffic sample data (TSD) was being developed, and was expected to be completed by June 2007.

3.18 Under cooperation arrangements between the FAA and the ATMB, ATMB would acquire two Global Positioning System (GPS) monitoring units (GMUs) to conduct aircraft height-keeping performance monitoring activities in China.

Special Co-ordination Meeting of the RVSM Implementation by China

3.19 The Special Co-ordination Meeting (SCM/RVSM China) was organized in order to facilitate the planning and implementation process. The SCM reviewed the implementation planning and, in particular, considered in detail the transition procedures and related issues.

3.20 The SCM expressed concerns about the breakdown of vertical separation during the transition between China RVSM levels and ICAO RVSM flight levels, which would happen when, for example, a Chinese ACC assigns an eastbound aircraft 8 900 m, which corresponds to FL 291, and a westbound aircraft was operating at FL 300 from a neighboring FIR. The SCM was of view that the procedures should be established to mitigate the breakdown of separation.

3.21 The SCM also identified the matters to be progressed by China and timelines for the work to be completed.

3.22 The following tentative schedule of meetings has been agreed by the RVSM/TF:

RVSM/TF/31 (Task Force meeting)	31 July – 3 August 2007	Bangkok
RVSM/TF/32 (Go/No-go decision meeting)	17–21 September 2007	Beijing
RVSM/TF/33 (90 days review meeting)	April 2008	TBD
RVSM/TF/34 (One year review meeting)	January 2009	TBD

Implementation of ATFM in the Bay of Bengal and South Asia

3.23 The meeting reviewed the outcomes of the Air Traffic Flow Management Task Force (ATFM/TF) convened under the auspices of the Bay of Bengal ATS Coordination Group (BBACG), that led to the decision taken by the ATFM/10 (May - June 2007) to implement a full and permanent operational ATFM system across the Bay of Bengal for air traffic transiting the Kabul FIR during the night time peak traffic period (2000-2359UTC).

3.24 The meeting recalled that at the ATFM/TF Special Coordination Meeting on 14 – 16 June 2006 convened to make a Go/No decision (SCM GO BOB ATFM) in respect of the Bay of Bengal ATFM Operational Trial, the ATFM/TF took the ‘Go’ decision to commence a ghosting phase of the ATFM Operational Trial on 29 June 2006, using the web-based automated Bay of Bengal Cooperative ATFM Advisory System (BOBCAT) developed by the ATFM/TF and Aeronautical Radio of Thailand Limited (AEROTHAI) specifically for this purpose.

3.25 As a result of satisfactory ghosting performance, the ATFM trial advanced to the operational phase on 24 July 2006 and, pursuant to a comprehensive review, at the ATFM/TF/7 meeting (31 July – 3 August 2006), the operational phase of the trial was extended until further notice.

3.26 The ATFM/TF progressed its work to review and evaluate the operational trial phase through ATFM/TF/8 held on 21-24 November, 2006, and ATFM/TF/9 held on 23 and 24 January 2007. It was of interest to note that during the 3 month period 1 August 2006 to 31 October 2006, more than 4000 aircraft had submitted slot requests to the web-based BOBCAT system.

3.27 The ATFM/TF/9 meeting identified that the following circumstances had caused, and would continue to cause, difficulties for some aircraft in satisfactorily achieving their allocated slot entering the Kabul FIR:

- a) adherence to Estimated Elapsed Time (EET) from Departure to Kabul entry fix;
- b) air traffic management of en route flight levels;
- c) non-compliance with allocated wheels up times (AWUT) and/or no request for missed wheels up time; and
- d) aircraft with no slot allocation or not adhering to the slot allocation

3.28 The ATFM/9 meeting established a small working group (SWG) to analyse flights that did not enter Kabul FIR at the BOBCAT allocated flight level, ascertain the reasons for the non compliance and take or recommend actions to correct the circumstances.

3.29 The meeting agreed also agreed that implementation of an additional alternative route to the south of P628 to be used only when bunching of flights occurred would adequately fulfill the purpose intended by the bypass route and was significantly less complex for India to manage.

3.30 The ATFM/TF/10 held on 30 April - 3 May 2007 was convened to conduct a thorough review of all aspects of the ATFM operational trial, with a view to making a “Go/No Go” decision in relation to advancing the operational trial to permanent implementation of ATFM procedures.

3.31 ATFM/TF/10 noted that the data analysis demonstrated continuous improvement by all involved. It also gave evidence that traffic had substantially increased from an average of 38 aircraft per night at the start of the trial in July 2006 to an average of 53 aircraft per night in April 2007. This equated to an average 38% increase over the 9 - 10 month period. Another positive factor was that 73% of aircraft received their allocated flight level or a higher suitable flight level in February 2007, and this increased to 88% in May 2007. On 26 May, all aircraft received their allocated flight level or a suitable higher level.

3.32 Although BOBCAT is configured to strategically space aircraft 15 minutes apart, in practice and attributable to good tactical ATC work by ANSPs, this gap was reduced to an average of 12 minutes during the busiest period. Additionally all four ATS routes available through the Kabul FIR were becoming more evenly used by airlines.

3.33 IATA had indicated to ATFM/TF/10 that they would support a 'Go' decision only on the basis of the following:

- a) the ATFM/TF continues to meet to monitor progress and identify improvements to the ATFM arrangements in line with the existing work programme, and
- b) a BOBCAT Scrutiny Group should be established that included appropriate membership from IATA and airspace users as well as other stakeholders to ensure the fully transparent and even-handed long term management of ATFM arrangements.

ATFM Implementation "Go" Decision

3.34 The meeting noted the concerns of IATA and, subsequent to a review of all relevant matters, unanimously agreed that the ATFM procedures should advance from operational trial to full and permanent operational implementation. However, it was recognized that there were still many areas in which improvements were necessary and that long term endeavors involving the continuation of the Task Force and establishment of a scrutiny group were essential.

Implementation Date 5 July 2007

3.35 In order to ensure the success of the ATFM implementation, the ATFM/10 meeting agreed that it was important that the aviation industry was provided with suitable advance notice of implementation. The AIP Supplement based on the model text provided by the ATFM/TF should be published as soon as possible and not later than 7 June 2007 AIRAC for effective date 5 July 2007, at which point the full fidelity operational trial would advance to formal implementation.

Benefits of ATFM Implementation

3.36 Thailand advised the meeting that they would be making continuous upgrades to the BOBCAT system in order to improve the system performance and associated benefits. Thailand highlighted some of the benefits that would accrue as result of the ATFM implementation, including:

- a) Fuel savings: approximately 12 million kg per year
- b) Carbon emission reduction: 50 million kg per year
- c) Airline operating cost savings: US\$12 million per year
- d) Minimize reroutes and diversions
- e) Maximize route and flight level usage

3.37 The meeting was advised that in the view of Thailand, BOBCAT is a milestone in enroute ATFM operations. It provides a slot allocation service to aircraft who are departing airports up to 7 hours away from the allocated entry window into the Kabul FIR and which will transit up to 10 FIRs with different airspace and separation requirements before reaching Kabul. From Thailand's perspective, this is the first such ATFM initiative of its kind in this region and arguably in the world. All of this could not have been achieved without the leadership of ICAO, the full cooperation of all affected ANSPs and the airlines, and the positive interaction by IATA.

3.38 The meeting recognized the significant environmental benefits that would result from this important initiative and congratulated all the members of the ATFM/TF on the remarkable achievement in implementing the international long range ATFM procedures for the Bay of Bengal and South Asia.

3.39 IATA had indicated, by way of a recent press release, their appreciation for the leadership of the Asia/Pacific Regional Office, the contributions of AEROTHAI to develop BOBCAT, and the efforts of States participating in the ICAO Air Traffic Flow Management Task Force.

IATA ATFM matters – Bay of Bengal implementation

3.40 IATA reminded the meeting that while ATFM operations were to be implemented in the Bay of Bengal and South Asia on 5 July 2007, there were still outstanding issues which needed to be addressed post implementation. The ATFM Task Force had agreed to the following actions and enhancements:

- a) Introduction of bypass routes to address the issue of traffic bunching in the earlier stages of the flight through the Bay of Bengal (some of the routes have been implemented or will be implemented shortly);
- b) Further route development and new border crossings between India, Pakistan to address the convergence of routes at DI;
- c) Afghanistan and Pakistan to explore a conditional diversionary route at TOXEX for N644;
- d) Improving the ground/ ground communications between Lahore and Karachi ACC with Kabul FIC;
- e) Pakistan and Afghanistan to explore the opening of B466 to traffic operating out of Mumbai for PAROD during the evening peak hours;
- f) ANSPs to continue to work together to further fine-tune the coordination to ensure that the non-participating aircraft do not deny participating aircraft of their allocated slots;
- g) ANSPs to continue to work towards ensuring that flights are cleared to the allocated flight levels;
- h) Airlines and ANSPs to ensure adherence to the AWUTs and ETOs in Kabul FIR to the fullest extent possible; and
- i) India and Pakistan to examine the possible reduction of MEA for P628 from FL320 to FL300.

3.41 The Task Force had also agreed that further refinements to the BOBCAT system might be required particularly with regard to issue of cancelled slots. With regard to the ATFM Task Force and the Scrutiny Group, it was decided that the ATFM Task Force would continue its good work in refining the ATFM system and the Scrutiny Group comprising states and some airlines would periodically examine the data to assess the output of the system, and recommend solutions. IATA looked forward to participating in the activities of both these groups.

Air Traffic Flow Management – Concepts

3.42 The FAA detailed current ICAO documentation regarding air traffic flow management (ATFM) and described some of the on-going initiatives in the Caribbean and South American areas. This had led to the development of a formal Concept of Operations for these areas, a draft version of which is shown at **Appendix A** to the Report on Agenda Item 3.

3.43 The United States congratulated the Bay of Bengal Air Traffic Flow Management Task Force for the significant strides in the initial implementation of international long range ATFM within the region. The FAA and JCAB have worked together on ATFM matters in recent years under the Informal Pacific Air Traffic Control Coordination Group (IPACG). The FAA is also working cooperatively with the ATMB of CAAC as they establish and implement an ATFM system in China. Similarly, there have been initial discussions between the FAA and Airports Authority of India on cooperation in the area of ATFM.

Operational Benefits of ATFM

3.44 The FAA, based on its experience with the ATFM system in the North American (NAM) region, outlined a number of operational benefits to include:

- a) increased information flow to airspace users regarding system constraints, route options, and terminal delays;
- b) reduced operating costs for airspace users through fuel savings and crew scheduling due to the type and amount of ATFM information available on a real-time basis;
- c) increased situational awareness by the ATFM Command Centers and ATFM units regarding air traffic flows and weather conditions, contributing significantly to the enhancement of system safety;
- d) increased operational communication and coordination between the ATFM Command Centers in the region, which has contributed to a more efficient use of airspace and the reduction of operational delays; and
- e) enhanced management of cross-border flows of air traffic, especially during periods of convective activity or periods of reduced terminal capacity.

3.45 The FAA requested the meeting to endorse the need to actively endorse AFTM in the Asia/Pacific region and consider conducting a seminar on the wider implementation of ATFM.

APANPIRG Key Priorities – ATFM

3.46 The meeting recalled that APANPIRG had recently added an item to its list of Key Priorities in relation to ATFM calling for States to consider and implement aspects of ATFM including:

- a) centralized ATFM;
- b) inter-regional cooperative ATFM;
- c) establishment of ATFM databases;

- d) application of strategic ATFM planning; and
- e) application of tactical ATFM planning.

3.47 In this context, the meeting agreed that a useful way forward in bringing existing ATFM techniques and procedures to the attention of States in the Asia/Pacific Region would be to conduct an ATFM seminar, as suggested by the United States. A Seminar would enable parties experienced in the provision of ATFM to pass on knowledge and guidance to States with less experience and was expected to lead to wider implementation of ATFM regionally with associated efficiency and environmental gains. The United States, Thailand and Australia offered support for such a seminar and the meeting drafted the following conclusion in this regard:

Draft Conclusion 17/1 – Conduct regional ATFM Seminar

That, noting the provisions of GPI- 6 *Air Traffic Flow Management* and the increasing numbers of actual and planned ATFM implementations occurring in the Asia/Pacific Region, the ICAO Asia/Pacific Regional Office conduct, with assistance from States experienced in ATFM, a 3-day Air Traffic Flow Management Seminar during 2008.

Implementation of conditional routes (CDRs)

3.48 The meeting noted that APANPIRG/17 had recognized that the establishment of conditional routes enhanced ATS safety, reduced flight mileage and time, increased fuel savings, and reduced CO₂ emission. The implementation of conditional routes also demonstrated effective civil-military coordination in accordance with APANPIRG Conclusion 16/17 in terms of the adoption of the equitable sharing of both convenience and inconvenience in the use of airspace and facilities by civil and military users. In addition, these types of conditional route implementations directly addressed Global Planning Initiative number 1 (GPI-1 *Flexible use of airspace*) from the Global Plan.

3.49 The meeting drew the attention of States to APANPIRG/17 Conclusions 17/7 and 17/8, and urged States to implement conditional ATS routes and route segments to the extent possible, and to follow ICAO guidance in Annex 11, Appendix 1 paragraph 2.2.1, c) and d), especially in respect to use of appropriate route designators.

Contingency Planning

Review of Indonesia Contingency Plan

3.50 The meeting recalled that the APANPIRG/17 (August 2006, Bangkok), in reviewing the draft Contingency Plan for the Jakarta and the Ujung Pandang FIRs, recognized that the final version of the Contingency Plan would serve as a useful model for other States of the Region in preparing contingency plans and called upon States (Conclusion 17/11) to adopt this model as the basis for preparation of national contingency plans in accordance with the requirements of Annex 11 – *Air Traffic Services*, paragraph 2.28.

3.51 The Contingency Plan Finalization Meeting (April 2007, Jakarta) reviewed and formally adopted the Indonesia Contingency Plan. The Plan would be introduced by Indonesia in the event of disruption of air traffic services to ensure safety of flight, and to facilitate limited flight operations commensurate with the prevailing conditions. Key elements arising from the Finalization Meeting that may be useful for other States in preparing their own plans are as follows:

Key Elements of the Plan

- The Plan would be activated by a NOTAM as far in advance as possible. When such prior notification was impracticable for any reason, the Plan would be put into effect on notification to the designated authority.
- In the event that the Indonesian International NOF was unable to issue the NOTAM, the (alternate) International NOF at Singapore and/or Brisbane would take action to issue the NOTAM of closure of airspace.
- Since the Plan was voluminous, a short summary of the Plan and the statement that a copy of the Plan could be obtained from the DGCA Indonesia would be promulgated by aeronautical information circular (AIC).
- The Plan provides arrangements for activating contingency routes and a flight level allocation scheme (FLAS) for both Jakarta and Ujung Pandang FIRs. Under the FLAS, vertical and lateral separation would be provided at all crossing points on the contingency routes, taking into consideration that aircraft would not change level while overflying in Indonesian airspace.
- The Indonesian airspace would be divided into two parts, North and South along latitude 05 00 00S then along the existing FIR boundary of the Jakarta and Ujung Pandang FIRs.
- Brisbane, Manila, Melbourne and Singapore Area Control Centers (ACCs) would provide flight information service (FIS) (not ATC service) for a designated airspace during the application of the Plan.
- All domestic flights should be temporarily suspended until a full assessment of the prevailing conditions had been determined and sufficient ATS restored.
- Australia, Papua New Guinea, Philippines and the United States had agreed that international operators might elect to avoid the Indonesian airspace and route to the east around the Ujung Pandang FIR.
- Airspace classifications might not be changed even if ATC services become unavailable during the interruption of ATS.
- The flight planning requirements to be followed are in accordance with normal flight planning requirements contained in the Indonesia Aeronautical Information Publication (AIP). Aircraft operators must obtain normal overflight approval from the DGCA Indonesia.
- It was considered that introducing traffic information broadcasts by aircraft (TIBA) procedures in the Contingency Plan, which contained contingency routes and a flight level allocation scheme, would create an unnecessary complexity to the Plan.

Signatories to the Plan

3.52 The Plan was developed in coordination with Australia, Malaysia, Philippines, Singapore, Sri Lanka, IATA and ICAO. However, the Finalization Meeting was of view that if the

neighboring States sign the Plan, the amendment of the Plan in the future should be signed by the States as well, which would result in a complex process to update the Plan. To insure timely updating of the Plan, the States concerned agreed that signing an operational coordination agreement (OCA) would be sufficient.

3.53 The meeting noted these developments and commended Indonesia and all other parties involved for their excellent efforts in establishing the Indonesian Contingency Plan. The meeting noted that the Contingency Plan was available from the DGCA, Indonesia and as the appendix to the Report of the Contingency Finalization Meeting on the ICAO Regional Office website, and encouraged other States in the region to follow this example and develop a similar Plan based on the Indonesian model.

ATS Interfacility Data Communication Review Task Force Meeting (AIDC/TF)

3.54 The meeting reviewed the outcomes of the ATS Interfacility Data Communication Review Task Force (AIDC/TF) Meeting held from 6 to 9 February 2007 at the Asia/Pacific Office, Bangkok, Thailand. The AIDC/TF had been convened under the terms of APANPIRG Decision 17/13 primarily for the purpose of updating the Asia/Pacific Regional Interface Control Document for ATS Interfacility Ground/Ground Data Communications (AIDC ICD).

3.55 The meeting reviewed the proposed version 3 AIDC ICD that had been drafted by the AIDC/TF and prepared a “version 3 plus ATM/AIS/SAR/SG/17” draft that incorporated some editorial changes. Additionally, the meeting reviewed recent feedback that had been received by the Secretariat in relation to the inclusion of SSR/Mode/Code in the ICD message definitions and included some amendments in this regard.

3.56 In addition to the general editorial/grammatical changes, the meeting adopted the following changes to the Version 3 ICD, for consideration by the CNS/MET/SG/11 and APANPIRG/18:

- *Appendix A* – Moved text relating to Field 15 and Field 3 entries from Part 1 (Purpose, Policy and Units of Measurement) to Appendix A, added additional text to clarify Field 7 b) and c) requirements, added explanatory text to TRU affecting the SPD and OTD identifiers, unhighlighted text in para 2.2.4.3 (the MAC examples), added a sentence under para 2.1.2 referring the reader to App D, amended the “ADS data field” to “ADS-C data field” in para 2.6.1.2, amended the “free text” field to “Other information” in the EMG and MIS messages, to standardize throughout the document;
- *2_the document* - Moved text relating to Field 15 and Field 3 entries from Part 1 (Purpose, Policy and Units of Measurement) to Appendix A as described above
- *Appendix D* - added additional explanatory words to para 2.4.8.1, and
- *Appendix E* - added a few missing “SSR Mode/Codes” to message definitions, amended the “free text field” in the EMG and MIS to “Other information” and amended a “navigation equipment” to “equipment”.

3.57 The meeting agreed that the draft “version 3 plus ATM/AIS/SAR/SG/17” document, shown in clean copy at **Appendix B** to the Report on Agenda Item 3, should be passed forward to the CNS/MET SG/11 meeting on 16-20 July 2007 for final review and requested that the Secretariat pass this updated draft ICD and the following draft Conclusion to the CNS/MET/SG/11 meeting for joint support and relay to APANPIRG/18:

Draft Conclusion 17/2 – Adopt Version 3 Asia/Pacific AIDC ICD

That the Version 3 *Asia/Pacific Regional Interface Control Document for ATS Interfacility Ground/Ground Data Communications* as shown in Appendix XX to the APANPIRG/18 Report on Agenda Item YY be adopted and published as updated regional guidance material.

3.58 The meeting reviewed the draft Decision calling for the dissolution of the AIDC/TF that had been prepared by the AIDC/TF meeting, noting the concerns expressed by the Secretariat to the AIDC/TF meeting that over a 12 or 13 year period, the AIDC Task Force had met on just 3 occasions. The Secretariat had highlighted that Task Forces were generally convened for a particular purpose and with specific terms of reference in order to address a defined and finite task. Subsequent to the completion of the task required, the Task Force should be dissolved.

3.59 The AIDC/TF meeting had considered that outstanding matters from the AIDC Task Force should be transferred to the ATM/AIS/SAR and CNS/ MET Sub Groups, however was unable to identify any such outstanding tasks during the meeting. Accordingly, the ATM/AIS/SAR/SG/17 meeting agreed that, having completed drafting the Version 3 of ICD for AIDC and having no outstanding tasks remaining, the AIDC Task Force should be formally dissolved by APANPIRG and supported the following draft Decision, as reworded from the AIDC Task Force draft Decision to this effect:

Draft Decision 17/3 – Dissolution of AIDC Task Force

That, having completed the Version 3 update of the Asia/Pacific AIDC ICD in accordance with the provisions of APANPIRG Decision 17/13 and having no outstanding tasks, the AIDC Task Force be dissolved.

ATS Interfacility Data Communication (AIDC) matters

3.60 The United States highlighted the complexities being experienced with implementing AIDC in the areas surrounding the USA. A variety of differing AIDC ICD provisions were in effect and this added complexity and expense in configuring automated systems to communicate with each other. In the absence of a global interface standards for AFTN based AIDC applications, the United States requested that the meeting bring the issues to the attention of ICAO and invite their attention to this matter.

3.61 Although aware that implementation of ATN AIDC was proceeding, the meeting considered that it would still be a number of years before AFTN applications were fully redundant. As such, AFTN AIDC interoperability for areas that had not yet transitioned to ATN would still result in worthwhile cost and efficiency savings in the implementation of AIDC. The meeting considered that the updated Version 3 Asia Pacific AIDC ICD could be a useful starting point in defining global provisions for AFTN AIDC and drafted the following Conclusion for consideration by CNS/MET/SG/11 and APANPIRG/18:

Draft Conclusion 17/4 – Global AFTN AIDC Interface provisions

That, recognizing the increasing implementation of AFTN based AIDC messaging between ACCs in the Asia/Pacific Region, the desirability of global harmonization and interoperability and the availability of the up-to-date Version 3 *Asia/Pacific Regional Interface Control Document for ATS Interfacility Ground/Ground Data Communications*, ICAO be invited to consider appropriate measures to facilitate standardized arrangements for AFTN based AIDC messaging for application on a global basis.

Traffic Sample Data State Letter

3.62 In follow up to APANPIRG/16 (August 2005), the Asia/Pacific Office issued a State Letter in November 2006 advising States of a standardized approach to the collection of vertical and horizontal traffic sample data, and emphasizing a number of relevant Conclusions adopted by APANPIRG/16. Also, States were reminded that TSD for December each year was required to be submitted to the relevant RMA, and if States did not provide the data they would be included on the APANPIRG List of Deficiencies in the air navigation fields. In this regard, APANPIRG/17 had included some States on the List of Deficiencies. RASMAG/7 (June 2007) had identified additional States for inclusion on the List of Deficiencies in this regard.

State Focal Point for Safety-Related Activities

3.63 The meeting noted that ICAO had placed considerable priority on identifying and rectifying air navigation deficiencies and strongly supported the sharing of safety data. APANPIRG/16 (August 2005) had considered that with the expansion of the Universal Safety Oversight Audit Programme (USOAP) during 2005 in the Asia/Pacific Region, and in view of the persistence of operational deficiencies as reported by IATA, a renewed effort should be made by States to take proactive action in tackling such deficiencies.

3.64 In an effort to address regional deficiencies and, in particular, to provide an ATS safety contact point in each State who would act as a focal point for safety related activities including the submission and coordination of ATS incident reports, APANPIRG/16 adopted Conclusion 16/62 requesting States to nominate a suitable contact point.

3.65 In this regard, the Regional Office had established the data base of the 'Safety Contact Officers' called for by APANPIRG, and this had been submitted to the various contributing bodies to APANPIRG for regular updating. Despite this, IATA informed the meeting that attempts to contact the officials listed had often been unsuccessful as a result of incorrect email addresses and telephone numbers and officials retiring or changing jobs. The meeting agreed that this was a disappointing outcome which severely limited the effectiveness of the List.

3.66 Accordingly, the meeting requested States present to review and update the database which is included as **Appendix C** to the Report on Agenda Item 3, taking particular care to ensure that all details on the list were accurate. Feedback should be provided to the Regional Office as soon as possible.

Aeronautical Information Services (AIS) MattersOutcome of the Asia/Pacific Comprehensive AIS Survey

3.67 The meeting was updated on the outcomes of the comprehensive survey on the current status of AIS in the Asia and Pacific Region, which covered all areas of AIS activities including details of status in relation to the automation of dynamic and static data, and availability of electronic terrain and obstacle data. The survey was arranged by the Regional Office in follow-up to APANPIRG/17 Conclusion 17/16, and States were provided with details in the State Letter Ref.: T3/10.1.6 – AP090/06 (ATM) issued on 11 September 2006.

3.68 The meeting reviewed the results of the AIS survey and noted that many States in the Region had not implemented AIS system improvements as required by ICAO, especially in the field of computerization and automation. The meeting considered ways to assist these States to improve their AIS capability and formulated the following draft Conclusion:

Draft Conclusion 17/5 – Assistance to States to improve AIS capability

That, in follow up to the comprehensive survey on AIS conducted in the Asia/Pacific Region in 2006/2007, ICAO undertake a special implementation project during the second half of 2008 for a workshop/seminar to be held on AIS automation.

Non-Compliance with Annex 15 AIRAC Notification Periods

3.69 The meeting recalled that APANPIRG/17 addressed the problem of continuing examples of implementation occurring without sufficient notice and non-adherence to the 28 day AIRAC cycle. This matter was referred to the second meeting of the ICAO Aeronautical Information Services Implementation Task Force (AITF/2, February 2007) with a view to identifying a solution to this persistent problem.

3.70 APANPIRG/17 agreed that the text of Conclusion 14/9 continued to adequately describe the long standing regional concerns in this respect and should be further promulgated. Accordingly, APANPIRG/17 adopted Conclusion 17/17 below, incorporating and superseding Conclusion 14/9.

Conclusion APANPIRG 17/17 – Non Compliance with Annex 15 Provisions

That, noting the regular and ongoing non-compliance with Annex 15 – Aeronautical Information Services provisions in respect to AIRAC notification periods, the ICAO Regional Office be requested to reinforce to States the critical safety nature of AIS and adherence to Annex 15 provisions, in particular those relating to AIRAC, as well as the need to ensure accurate and timely publication of AIS data.

3.71 Australia suggested to AITF/2 that one of the causes of non-compliance to AIRAC cycles by States was the late arrival of information, and suggested that mitigation strategies be developed.

3.72 In this regard, AITF/2 considered that the lack of knowledge in the field of AIS among the administrations, project managers, navaid maintenance technicians, etc. could be brought to the attention of the Annual Conference of the Directors General of Civil Aviation (DGCA's) for consideration and commitment to ensure compliance by States with the AIRAC cycles. Ensuring that project managers be aware of AIS cut-off dates was provided as an example.

3.73 The meeting noted the report of AITF/2, and on reviewing draft Recommendation by the AITF/2 in regard to AIRAC notification, agreed to adopt the recommendation and formulated the following draft Conclusion:

Draft Conclusion 17/6 – State Compliance with AIRAC notification periods

That, in light of the longstanding concerns of APANPIRG in respect to the importance of regular and ongoing compliance by AIS service providers with Annex 15 – *Aeronautical Information Services* provisions on AIRAC notification periods, and in order to make stakeholders aware of the AIRAC system, the Regional Office urge States to implement robust measures as soon as practicable to promulgate relevant information to aviation administrations, airport authorities, project managers, airspace planners, construction companies, etc, and to include this item in their safety oversight programmes.

3.74 In light of the foregoing, the meeting also agreed with the AITF/2 that the 44th Conference of DGCAs to be held in Xi'an, China on 22-26 October 2007 should be informed of APANPIRG's concerns in this regard. State civil aviation authorities concerned should take action to put in place measures to ensure that AIS service providers strictly observe the Annex 15 AIRAC provisions and ensure that implementation project time lines that required AIS notification were harmonized accordingly. In this regard, the Regional Office would bring this matter to the attention of the Conference of DGCAs in October 2007.

Outcomes of the Second Meeting of the AIS Implementation Task Force

3.75 The meeting reviewed the outcomes of the AITF/2, as highlighted below. The Regional Office expressed appreciation to Australia and Japan for their leading role in operating the Task Force. The next meeting of the Task Force, AITF/3 would be over three days in the first quarter 2008 at the Regional Office, Bangkok, Thailand. A full review of the activities of the AITF is available on the ICAO website at http://www.bangkok.icao.int/meetings2007_sch.html.

- In relation to non-adherence to AIRAC cycle, States should take measures to promulgate the AIRAC system to aviation administrations, airport authorities, project managers, airspace planners, construction companies, etc.
- AITF/2 reviewed the result of the AIS Survey in 2006.
- In relation to AIS deficiencies, Australia would continue to lead a sub-group to develop a full program of activities.
- AITF/2 reviewed the outcomes and recommendations from the AIS Congress and noted their continuing relevance.
- Japan reported the activity of EUROCONTROL on the Terrain and Obstacle Workshop and the Working Group (WG) of the Terrain and Obstacle.
- The draft for the amendment to Chapter 3 of the *Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region* would be proposed at the ATM/AIS/SAR/SG/17.

Amendment to Chapter 3 of the Guidance Material for Aeronautical Information Services (AIS) in the Asia/Pacific Region

3.76 Japan reported that the AITF/1 (March 2006, Bangkok) reviewed the EUROCONTROL OPADD presented by Japan. Subsequently, Japan had presented to the AITF/2 the Euro OPADD Editions 2.0 and 2.1, which had been distributed to participants at the AITF/1 by CD. The *Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region* (First Edition, 2002) was also presented to AITF/2.

3.77 Following a thorough review, the AITF/2 had agreed to a draft for the amendment to Chapter 3 of the *Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region*, to be proposed to ATM/AIS/SAR/SG/17 for review.

3.78 The meeting conducted a review of the proposed amendment to Chapter 3 of the *Guidance Material* and expressed appreciation to Japan for their tireless and hard work in preparing the draft Chapter 3 of the Guidance Manual. The meeting agreed to the revised guidance material to be published in Chapter 3, formulating the following Draft Conclusion:

Draft Conclusion 17/7 – Amendment to Chapter 3 of *Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region*

That the amended Chapter 3 (OPADD) of the *Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region* as shown in Appendix XX to the APANPIRG/18 Report on Agenda Item 2.1 be adopted and circulated as regional guidance material.

Review of Amendment 34 to Annex 15

3.79 New Zealand presented information on issues arising from its review of ICAO Amendment 34 to Annex 15 applicable on 22 November 2007. As amended Item B) of the NOTAM format, the “From” date-time group under the “Period of Validity” heading of the NOTAM Format, is the date-time at which the NOTAMN, NOTAMR or NOTAMC comes into force, a Replacement Notice, NOTAMR, may replace a NOTAM which is already in force, that is, the event to which the original Notice relates has commenced. It may, however, be necessary to replace a NOTAM which relates to an event which is yet to commence, that is, the NOTAM being replaced although extant and valid has not yet come into force.

3.80 New Zealand pointed out that in the latter case, the question arises as to at what date-time does the NOTAM being replaced cease to be extant (and is withdrawn from the AIS database)?. The current wording of Amendment 34 in this regard was confusing, and should be clarified.

3.81 New Zealand advised the meeting that the EUROCONTROL Operating Procedures for AIS Dynamic Data were quite explicit and unambiguous and not inconsistent with the provisions of Annex 15, Appendix 6, as amended, because the EUROCONTROL procedures require that NOTAMR shall have immediate effect, and prohibit a NOTAMR with a future date-time coming into force.

3.82 In light of the above and taking into consideration the EUROCONTROL Operating Procedures for AIS Dynamic Data, the meeting agreed that further clarification of Amendment 34 and related guidance material was necessary, and accordingly formulated the draft Conclusion as follows:

Draft Conclusion 17/8 – Review of the NOTAM format

That, in light of various terminologies in common use for NOTAM, such as date-time of filing, date-time of origination, effective, applicable, period of validity, comes into force and the need for NOTAMC and NOTAMR to be explicit and unambiguous, ICAO be invited:

- a) to review and revise Annex 15 – *Aeronautical Information Services*, Appendix 6 - NOTAM Format, Instructions for the Completion of the NOTAM Format, Section 5 – Item B to provide that NOTAMC and NOTAMR shall have immediate effect and prohibit a NOTAMC and a NOTAMR with a future date-time coming into force; and
- b) define the terminologies used for NOTAM in the Instructions for Completion.

Implementation of Electronic Terrain and Obstacle Data (eTOD) in Hong Kong, China

3.83 Hong Kong, China presented the meeting with their experiences in regard to the preparation for the provision of electronic terrain and obstacle data (eTOD) numerical requirements in Annex 15 for implementation in November 2008 and November 2010.

3.84 In an endeavor to comprehend the ICAO requirements, Civil Aviation Department (CAD) had engaged a European consultancy company that specialized in aeronautical geodesy to provide training and review the electronic maps provided by the Lands Department of the Government of the Hong Kong Special Administrative Region, which provided the majority of CAD's survey services in Hong Kong.

3.85 The review indicated that although the terrain data was very comprehensive and of an acceptable accuracy, it could not currently be used by CAD. In addition to the technical matters, CAD has concerns about Intellectual Property Rights issues.

3.86 Hong Kong, China informed the meeting that the draft ICAO Doc 9881 'Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information' and the RTCA reference including DO-276A and DO-291 were studied, but the exact requirements of eTOD could not be understood and urged ICAO to make available Doc 9881 'Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information' as soon as possible.

Difficulties implementing eTOD

3.87 The meeting noted that ICAO has prepared the *Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information* (Doc 9881), but there had been no indication as to when ICAO would publish the document.

3.88 The meeting noted, as indicated by Hong Kong, China, that there were difficulties in implementing eTOD from November 2008 as required by Annex 15. Based on the review of the information, the meeting formulated the draft Conclusion as follows:

Draft Conclusion 17/9 – Strategies to implement eTOD

That ICAO, in light of the experiences encountered by States attempting to implement Annex 15 provisions on eTOD, be invited to:

- a) hold an eTOD Workshop in the Asia and Pacific Region during 2008;
- b) make available the *Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information* (Doc 9881), as soon as possible; and
- c) provide specific guidance on cost recovery and property rights of eTOD material.

3.89 In noting that draft Conclusions 17/5 and 17/9 had both called for workshop/seminar activities, the meeting requested that consideration be given to holding both events consecutively at the Regional Office to mitigate travel expenses etc.

Establishment of the AIS Center in Japan

3.90 Japan provided the meeting with information regarding the establishment of an AIS Center (AISC) by the Japan Civil Aviation Bureau (JCAB) including the International NOTAM Office located in Narita on 1 April 2007 as a unique AIS unit in Japan. The AISC commenced services on 1 July 2007.

3.91 In the establishment of the AISC, the following items were taken into considerations:

- a) international standard aeronautical information model;
- b) development of guidelines for the application of ISO9000 standards to AIS;
- c) development of an amendment to Annex 4 – electronic terrain data;
- d) review of Annex 4 specifications relating to Aerodrome Obstacle Charts and development of specifications for the use of digital terrain and obstacle data; and
- e) direct transfer of aeronautical information into the FMS.

Overview of the United States NAS Aeronautical Information Management Digital NOTAM Program

3.92 The United States provided information on the FAA's activities in AIS that supported the United States National Airspace System (NAS) and International usage in Digital Notice to Airman (NOTAM). The FAA recognized that for safety and capacity there was a need to move to a digital information exchange of data. This was also generally recognized internationally.

3.93 The FAA concept was to create the NOTAM at the source in order to maintain data integrity and traceability, thus providing a maintainable chain-of-custody for data quality. An application had been created for creating NOTAMs, along with a data model that provides structure of the data. This application creates a graphical output that was a machine readable standards based message.

3.94 There were several strategies in the aeronautical information arena that were ongoing that would help pull together the FAA goals for achieving digital NOTAM implementation. The foundations of this effort were based on AIXM Version 5, industry requirements from RTCA/EUROCAE Sub-Group 206, digital NOTAM trials both in EUROCONTROL and the FAA, and policy based on AIS Operating Procedures and ICAO Annex 15.

Search and Rescue (SAR) Matters

3.95 The meeting noted that APANPIRG/17 had addressed the following SAR matters:

- a) Updating the List of SAR Agreements and the SAR Capability Matrix;
- b) special implementation project for SAR; and
- c) search and rescue coordination between maritime and aviation authorities.

Improving SAR Services within the Region

3.96 The United States outlined recent successful efforts by ICAO for Search and Rescue (SAR) in the Asia/Pacific region but noted that there were no planned follow-on activities to build upon the awareness and momentum generated by these efforts. With the forecast unprecedented growth in air traffic in the region, it would be prudent for all States in the region to consider how to improve their SAR capability as well as how to assist States that have difficulty in providing SAR services. National authorities need to be prepared for a SAR incident within their own SAR region as well as concerns raised for their aircraft and citizens in a SAR incident in another State's SAR region, including the vast ocean areas.

3.97 The meeting was requested to: consider the recommendations of the *Final Report on the Special Implementation Project, ICAO Search and Rescue Workshop, ICAO Asia and Pacific Office* as applicable (as shown in Appendix F to the Report of Agenda Item 3); develop a list and process for improved coordination and information sharing, where appropriate, with maritime SAR authorities and other regional forums, and encourage participation of aeronautical SAR authorities in the SAR Workshop for Pacific Island States which would be held from 26 – 30 November, 2007 in Honolulu, Hawaii. The intention was to make such a SAR Workshop a regular event to be held a two yearly intervals and support from affected States would greatly assist in achieving this aim.

SAR Capability Matrix Table

3.98 The meeting reviewed and updated the APANPIRG list of SAR Agreements and the SAR Capability Matrix Table as presented in **Appendices D** and **E** to the Report on Agenda Item 3 respectively. The Secretariat thanked States for the input received during the meeting and would ensure that these updates were entered into the tables prior to the APANPIRG/18 meeting in September 2007.

3.99 In respect to the format of the SAR Capability Matrix, the United States informed the meeting about feedback that had been received in terms of the column headed Local User Terminal (LUT). Of equal or more importance to having LUT capability was whether or not States had nominated a SAR Point of Contact (SPOC) to COSPAS SARSAT to enable quick and effective coordination to take place. As such, the meeting considered that the inclusion of a column in the Matrix for SPOC was important and debated whether the LUT column should be discarded in favor of a SPOC column.

3.100 The meeting recognized that the format of the SAR Capability Matrix had been established many years ago and that no review of the format had taken place since that time. In light of the LUT/SPOC discussions above, it was timely that a full review of the format took place to ensure that it was still fit for the purpose intended. As the United States was an active member of the ICAO-IMO Joint Working Group on SAR, the meeting sought assistance from the United States in bringing the Asia/Pacific Matrix before the Joint Working Group for overall review, drafting the following Conclusion in this respect:

Draft Conclusion 17/10 – JWG Review of Regional SAR Capability Matrix

That the Regional Office seeks the assistance of the United States in coordinating a review of the format of the Asia/Pacific SAR Capability Matrix by the ICAO-IMO Joint Working Group on SAR, with particular guidance sought in relation to COSPAS SARSAT capabilities including Local User Terminal and SAR Point of Contact.

SAR Workshop

3.101 The ICAO SAR Workshop (Bangkok Thailand, 26 February – 2 March 2007), in its review of the information provided and discussions held, formulated a list of recommendations which have been reproduced as **Appendix F** to the Report on Agenda Item 3. Upon reviewing the recommendations, the meeting agreed that they should be taken into account by States in the region and the Regional Office when considering their SAR activities, and formulated the following draft Conclusion:

Draft Conclusion 17/11 – Promulgate Recommendations of the ICAO February 2007 SAR Workshop

That, the recommendations made by the ICAO SAR Workshop held at Bangkok, Thailand on 26 February - 2 March 2007, as shown in Appendix XX to the APANPIRG/18 Report on Agenda Item 2.1, be promulgated regionally by the ICAO Asia/Pacific Regional Office and be taken into account by States and the Regional Office in considering their future SAR activities.

Sharing of SAR information

3.102 The meeting was informed that Annex 12 – *Search and Rescue* (SAR) and the *International Convention on Maritime SAR* under the International Maritime Organization (IMO) call for harmonization of maritime and aeronautical SAR. The maritime counterpart in the Asia/Pacific region is the Asia-Pacific Heads of Maritime Safety Agencies (APHMSA), which meets each April. The meeting was informed that both APANPIRG and APHMSA discuss common SAR matters but there appeared to be a very limited sharing of information between the two regional groups.

3.103 The United States drew the attention of the meeting to the annual cycle of meetings relevant to the Asia/Pacific region in relation to the SAR matters. The annual meeting of APHMSA was generally held in April, followed by the ATM/AIS/SAR Sub Group in late June/early July, then APANPIRG in late August/early September and finally the ICAO-IMO Joint Working Group for SAR which met in September. This existing meeting cycle meant that information could be readily passed from meeting to meeting without delay.

3.104 The meeting recognized the benefits of sharing resources and information between aeronautical and maritime SAR agencies and agreed that taking advantage of this flow of meetings would lead to more effective coordination and efficient use of limited SAR resources. The meeting agreed that coordination was necessary with, and between, these respective groups and the United States agreed to attempt to progress work in this area by taking advantage of its membership of each of the nominated groups to stimulate discussions in this respect. The meeting agreed to the following draft Conclusion in respect of these matters:

Draft Conclusion 17/12 – Promote relationships between APANPIRG, APMHSA and the ICAO-IMO Joint Working Group

That, recognizing that APANPIRG, the Asia-Pacific Heads of Maritime Safety Agencies (APHMSA) and the ICAO-IMO Joint Working Group on SAR discuss common SAR matters of relevance to the Asia/Pacific Region, the Regional Office seek the assistance of the United States in coordinating the SAR reporting activities of APANPIRG with the other two groups on a reciprocal basis.

Hong Kong, China international SAR Seminar and SAREX

3.105 Hong Kong China informed the meeting that they expected to hold an international SAR Seminar and SAREX in October/November 2008. Details were still to be fully finalized, however it was expected that and invitations to attend would be issued widely to international participants.

3.106 The meeting thanked Hong Kong China for their attention to SAR matters in general and for the regular International SAREXs hosted by Hong Kong China. The meeting also recognized the substantial contribution from Singapore in also hosting regular international SAREXs.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

Caribbean/South American Air Traffic Flow Management Concept of Operation (CAR/SAM ATFM CONOPS)

Version	1.2
Date	June 2007

FOREWORD

The *Caribbean/South American ATFM Concept of Operations* (CAR/SAM ATFM CONOPS) is published by the ATM/CNS Subgroup of the Caribbean/South American Regional Planning and Implementation Group (GREPECAS). It describes an air traffic flow management operational concept to be applied in both regions.

The GREPECAS and its contributory bodies will issue revised editions of the Document as required to reflect ongoing implementation activities.

Copies of the *CAR/SAM ATFM Concept of Operations* can be obtained by contacting:

ICAO NORTH AMERICAN, CARIBBEAN, AND CENTRAL AMERICAN OFFICE

MEXICO CITY, MEXICO

E-mail : icaonacc@mexico.icao.int
Web site : www.icao.int/nacc
Fax : +5255 5203-2757
Mail : P. O. Box 5377, México 5 D. F., México
Point of contact
E-mail : vhernandez@mexico.icao.int
bmesen@mexico.icao.int

ICAO SOUTH AMERICAN OFFICE

LIMA, PERU

E-mail : mail@lima.icao.int
Web site : www.lima.icao.int
Fax : +511 575-0974 / 575-1479
Mail : P. O. Box 4127, Lima 100, Peru
Point of contact
E-mail : jf@lima.icao.int
ao@lima.icao.int

The present edition (Version 1.1) includes all revisions and modifications until April 2007. Subsequent amendments and corrigenda will be indicated in the Record of Amendment and Corrigenda Table, according to the procedure established in page 3.

The publication of amendments and corrigenda is regularly announced through correspondence with States, and the ICAO web site, which holders of this publication should consult. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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AMENDMENTS TO THE DOCUMENT

1. The CAR/SAM ATFM CONOPS is a regional document that includes aeronautical, scientific, and technological advances related to ATFM. It also includes the operational experiences gained in the CAR/SAM Regions, as well as in other ICAO Regions, that may affect ATFM concepts and procedures.

2. Due to its unique and regional focus, the CAR/SAM ATFM CONOPS is also a dynamic document and is in continuous progress and permeable in order to accept every modification originated by the ATM/CNS subgroup. This will allow for constant improvement based on experience gained from aeronautical disciplines and activities, enable its harmonious implementation in the CAR/SAM Regions, and ensure air operations efficiency and maintain agreed levels of safety.

In order to keep this ATFM CONOPS updated and make the required changes and/or modifications, the following amendment procedures have been established.

1. The ATFM CONOPS consists of a series of loose-leaf pages organized in sections and parts describing the concepts and procedures applicable to ATFM operations in the CAR/SAM Regions.

2. The framework of the sections and parts, as well as the page numbering have been developed so as to provide flexibility, facilitating the review or the addition of new texts. Each Section is independent and includes an introduction giving its purpose and status.

3. Pages bear the date of publication, as applicable. Replacement pages are issued as necessary and any portions of the pages that have been revised are identified by a vertical line in the margin. Additional material will be incorporated in the existing Sections or will be the subject of new Sections, as required.

4. Changes to text are identified by a vertical line in the margin in the following manner:

Italics for new or revised text;

Italics for editorial modification which does not alter the substance or meaning of the text; and

~~Strikethrough~~ for deleted text.

5. The absence of change bars, when data or page numbers have changed, will signify re-issue of the section concerned or re-arrangement of text (e.g. following an insertion or deletion with no other changes).

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GLOSARIO DE ACRÓNIMOS/ACRONYMS GLOSSARY

ACC	Centro de control de área Area control center
AFTN	Aeronautical fixed service Red de telecomunicaciones fijas aeronáuticas Aeronautical fixed telecommunication network
AIP	Publicación de Información aeronáutica Aeronautical Information Publication
AIS	Servicio de información aeronáutica Aeronautical information service
ANP	Plan navegación aérea Air navigation plan
ANS	Servicios de navegación aérea Air navigation services
ANSP	Proveedor de servicios de navegación aérea Air navigation service provider
AO	Operador de aeronave Aircraft operator
APP	Oficina de control de aproximación Approach control office
ATC	Control de tránsito aéreo Air traffic control
ATFM	Gestión de la afluencia del tránsito aéreo Air traffic flow management
ATM	Gestión del tránsito aéreo Air traffic management
ATS	Servicios de tránsito aéreo Air traffic services
CAA	Administración de aviación civil Civil aviation authority
CAR/SAM	Regiones Caribe y Sudamérica Caribbean and South American Regions
CATFM	Dependencia de Gestión de la afluencia del tránsito centralizada Centralized air traffic flow management unit
CBA	Análisis de costo/beneficios Cost/benefit analysis
CNS/ATM	Comunicaciones, navegación y vigilancia/gestión del tránsito aéreo Communications, navigation, and surveillance/air traffic management
FDPS	Sistema de procesamiento de datos de vuelo Flight data processing system
FIR	Región de información de vuelo Flight information region
FMU	Dependencia de organización de la afluencia Flow management unit
FMP	Puestos de gestión de afluencia Flow management position

FPL	Plan de vuelo Flight plan
GREPECAS	Grupo regional de planificación y ejecución CAR/SAM CAR/SAM regional planning and implementation group
MET	Servicios meteorológicos para la navegación aérea Meteorological services for air navigation
OACI/ICAO	Organización de aviación civil internacional International civil aviation organization
PANS ATM	Procedimientos para los servicios de navegación aérea –Gestión de tránsito aéreo Procedures for Air Navigation Services –Air traffic management
PIRG	Grupo regional de planificación y ejecución Planning and implementation regional group
TBD	A ser determinado To be determined
TMA	Area de control terminal Terminal management area
TWR	Torre de control Tower
WWW	Red mundial World Wide Web

Explanation of terms and expressions

The writing and explanation of some terms and particular expressions used in this document are defined for a better understanding

Homogeneous ATM area. A homogeneous ATM area is an airspace with a common ATM interest, based on similar characteristics of traffic density, complexity, air navigation system infrastructure requirements or other specified considerations wherein a common detailed plan will foster the implementation of interoperable ATM systems.

Routing area. A routing area encompasses one or more major traffic flows, defined for the purpose of developing a detailed plan for the implementation of ATM systems and procedures.

Centralized ATFM. A centralized unit responsible for the provision of air traffic flow management within a specific area.

Capacity (for ATFM purposes). The maximum number of aircraft that can be accommodated in a given time period by the system or one of its components (throughput).

ATM Community. All the organizations, bodies or entities which might participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATM System.

Demand. The number of aircraft requesting to use the ATM system in a given time period.

Efficiency. The ratio of the cost of ideal flight to the cost of procedurally constrained flight.

Air Traffic Flow Management (ATFM). A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.

Air Traffic Management. Service which comprises airspace management, air traffic flow management and air traffic services.

Flight Management Position/Unit – FMP/FMU). A position or working unit established in an appropriate air traffic control unit to ensure the necessary interphase between the local ATFM and a centralized ATFM units related to air traffic flow management – ATFM.

Main Traffic Flows. It is a concentration of significant volumes of air traffic on the same or proximate flight trajectories.

Air Traffic Management System. A system which provides ATM through the integration in cooperation with human beings, information, technology, facilities and services, with the support of communications, navigation and surveillance on board and spatial based.

Air Traffic Volume. The number of aircraft within a defined airspace or aircraft movement in an aerodrome, within a specific time frame.

Executive summary

GREPECAS considered that early ATFM implementation shall ensure optimum air traffic flow towards specific areas or through them during periods in which the demand exceeds or is foreseen to exceed available capacity of the ATC system. Therefore, an ATFM system should reduce aircraft delays both in flight and ground and avoid system overloading.

In this connection, GREPECAS approved the operational concept described herein, which reflects the expected order of events which might occur and should assist and guide the planners in the design and gradual development of ATFM system, in order to provide safety and effectiveness, and ensure an optimum air traffic flow towards certain areas or through them during periods in which the demand exceeds or is foreseen to exceed the available capacity of the ATC system.

The main actors involved in air traffic flow management *are* the organizations, bodies or entities which might participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATFM System.

From the analysis of the statistics it may be noted that during the period 1994-2004, the passengers regular traffic (in PKP) of airlines in the Latin American and Caribbean Region grew at an average annual rate of 3.3% (in comparison to the 5.1% annual rate of global growth, foreseeing that air traffic growth continues to gradually improve at mid term, at the same time that the economical activity.

The total of operations of the main airports of the CAR Region in the period 2002 to 2005 reflected a positive trend of 1.92%. However, in the same period the trend in the SAM Region was negative -0.56% being the global trend positive 0.66% for both regions.

Also, several airspaces with common interests have been identified *with regard to* air traffic management, based on similar characteristics of traffic density, complexity and air navigation system infrastructure requirements within which a common plan shall foster the implementation of the ATM Global Operational Concept. A description of such homogeneous and routing areas is attached *to the* CAR/SAM ATFM CONOPS.

As established in ICAO documents, air traffic flow management should be implemented within a region or within other defined areas as a centralised ATFM organization, with the support of flow management units (FMU) established in each ACC within the region or area of application.

In view of the above, this document describes the main objectives of the Centralized ATFM Facility which include: assist ATC in making the maximum use of its airspace and capacity; issue flow management initiatives, as required, in order to maintain a safe, orderly and expeditious flow of air traffic; ensure that air traffic volume is compatible with declared capacities; develop a description of the principles and functions of flow management units; and establish the requirements for equipping flow management units and Centralized ATFM Facilities.

In the current operational concept, GREPECAS establishes a simple implementation strategy through the development in phases in order to ensure maximum utilisation of available capacity and permit all parties concerned to obtain sufficient experience. The implementation would be initiated with the application of

basic ATFM procedures in airports and in an evolutionary manner to reach more complex phases, without the immediate need for a regional ATFM centre, since its implementation would demand further studies to define operational concepts, systems requirements and institutional aspects for its implementation.

Finally, GREPECAS deemed pertinent to establish exceptions for the application of ATFM measures for aircraft performing ambulance flights, humanitarian flights, search and rescue operations and State aircraft in international flights, leaving at the discretion of the States/Territories and International Organizations the measures to be adopted on this matter for domestic flights. It also set out that for a partial or total interruption of flow management and/or support services the corresponding contingency will also be available.

1. History

1.1 ICAO CNS/ATM Systems received support from the Tenth Air Navigation Conference held in 1991 at ICAO Headquarters in Montreal, Canada. The same year, the CAR/SAM Regional Planning and Implementation Group (GREPECAS) started to work towards a regional application of this new air navigation services concept.

1.2 Further, at the Eleventh Air Navigation Conference (AN-Conf/11, Montreal September 2003), States supported and approved the new ICAO ATM Global Operational Concept, which encourages the implementation of a services management system which enables an operationally continuous regional airspace through the application of a series of ATM functions.

1.3 As per the guidance principles established by ICAO Council with regard to the facilitation of the inter-regional harmonization, the regional plans for CNS/ATM systems implementation in the regions should be prepared in accordance to the general profiles defined in the Global Air Navigation Plan for CNS/ATM Systems. After a careful analysis of the guidance principles of this Global Plan, GREPECAS adopted them and incorporated characteristics inherent to the CAR/SAM Regions, using as a basis the definitions of Homogeneous Areas and Main Traffic Flows. Homogeneous areas are those airspace portions with ATM requirements and similar complexity degrees, while main air traffic flows are airspaces where a significant amount of air traffic exists.

1.4 From the analysis carried out by ICAO/UNDP Project RLA/98/003, it may be inferred that while in general terms in the CAR/SAM Regions environment, currently no traffic congestions are registered requiring a complex flow management, they have been identified in some airports and airspace sectors, mainly in special periods and specific hours, where some congestions are already produced, which should be avoided.

1.5 In view of the above, GREPECAS considered that the early implementation of the ATFM shall ensure an optimum air traffic flow towards some areas or through them, during periods in which the demand exceeds or is foreseen to exceed the available capacity of the ATC system. Therefore, an ATFM system should reduce aircraft delays both in flight and ground and avoid system overloading. The ATFM system shall assist the ATC to comply with its objectives and achieve a more effective utilisation of the airspace and airports available capacity. ATFM should also ensure that air operations safety is not compromised in case unacceptable levels of air traffic congestion occur and at the same time ensure that air traffic is effectively administered without applying unnecessary restrictions to flow.

2. Purpose of the document

2.1 The CAR/SAM ATFM CONOPS document is a high level description of service to be provided in the CAR/SAM Regions during a specific time horizon. It explains the current situation as well as the future situation which will be reached through a series of specific stages.

2.2 The operational concept described herein reflects the expected order of events and should assist and guide the planners in the design and gradual development of the ATFM system. The concept is designed to promote safety, efficiency, and an optimum flow of traffic in areas where demands exceed, or is forecast to exceed, the available capacity of the ATM system.

3. **Actors involved in ATFM**

3.1 The ATFM community includes organizations, bodies or entities which could participate, collaborate and cooperate in the planning, development, utilisation, regulation, operation and maintenance of ATFM system. Among them, the following may be emphasized:

3.2 **Aerodrome Community.** Includes aerodromes, aerodromes authorities and other parties involved in the provision and operation of the physical infrastructure needed to support the take-off, landing and ground handling of aircraft.

3.3 **Airspace Providers.** Refers in general terms to Contracting States in their own capacity with legal authority to permit or deny access to their airspace sovereignty. The expression may also be applied to organizations of the State to which the responsibility has been assigned to establish standards and guidelines for the airspace use.

3.4 **Airspace users.** Refers mainly to airlines and pilots.

3.5 **ATM service providers.** Constituted by all the organizations and personnel (i.e. controllers, engineers, technicians) implied in the provision of ATFM services to airspace users.

3.6 **Military aviation.** Refers to the personnel and material of military organizations as well as their vital role in States' security.

3.7 **International Civil Aviation Organization (ICAO).** Considered as the only international organization responsible for efficiently coordinating the implementation activities of global ATM which lead to a real, continuous global ATM.

4. Trends and traffic forecasts in the main airports of the CAR/SAM Regions

4.1 During the period 1994-2004, the Latin American and Caribbean Region's airlines passengers' regular traffic (in PKP) grew at an annual average of 3.3% (in comparison to the global annual average growth rate of 5.1%). Until year 2000 privatisation of national carriers fusions and inter-regional alliances, together with a wide rationalization of fleets and routes, counted among the measures that enabled airlines of the regions to capture a greater portion of traffic of United States – Latin America and Caribbean, one of the aviation markets with greater growth rate. After high traffic growth rates in 1997 and 1998 (9.5% and 7.8% respectively), the passengers traffic decreased in 1999 in a 0.3% but it was recovered in 2000 with a growth rate of 4.4%, decreasing again in 2001 in 5.1%. The traffic decreased in 1.6% in 2002 before recovering in 2003 (3.8%) and 2004 (8.4%). In some CAR/SAM areas the traffic growth in 2005 registered scopes of up to 13%.

4.2 Aircraft movement in the main airports in the period 2002-2005 would indicate that, in the CAR Region the total operations reflect a positive trend of 1.92% observing that in some States particularly, positive trends are reflected that vary from 2.42% to 6.41%. In the SAM Region, the total of operations reflected a negative trend of -0.56% between years 2002 to 2005 observing that some States particularly reflect positive trends which vary from 0.85% to 4.79%.

4.3 Making a balance of the previous information, it is observed that during years 2002 to 2005 the global trend in the CAR/SAM Regions is reflected in a positive 0.66%. It is foreseen that the traffic growth continues to gradually improve at mid term at the same time than economical activity.

5. Main traffic flows

5.1 The CAR/SAM air navigation plan has identified several airspaces with common interests as regards air traffic management, based on similar characteristics of traffic density, complexity and air navigation system infrastructure requirements within which a common plan shall foster the implementation of the ATM Global Concept. Within these routing areas the main traffic flows have also been identified following the same or close flight trajectories between pairs of cities.

5.2 These routing areas and the respective traffic flows are described in the Table shown as **Appendix A** to this document.

6. Identification of areas and/or routes where traffic congestion is produced

6.1 Currently, saturation periods have been identified in several airports and traffic flows *in* some portions of the CAR/SAM FIRs. In view of this, it is necessary that CAR/SAM States, Territories, and International Organizations maintain and disseminate to all interested parties *a list of* the saturation periods of their respective airports, terminal areas and traffic flows.

7. Objectives, principles and functions of a Centralized ATFM Facility

Objective of the Centralized ATFM Facility

7.1 As established in the PANS ATM (Doc 4444), air traffic flow management should be implemented within a region, *or other defined area*, as a Centralized ATFM Facility with the support of flow management positions (FMP) established in each ACC within the region or area of application.

7.2 The objective of the Centralized ATFM Facility is to enhance efficiency and safety of air traffic operations by demand and capacity balancing and traffic synchronization. This may be accomplished by the use of flow management initiatives to maintain a safe, orderly and expeditious air traffic circulation while ensuring that the traffic volume is compatible with the declared capacities.

7.3 Consequently, States, Territories, and International Organizations may define whether a Flow Management Unit, and the associated Flow Management Positions, should be established in the interim phase before the implementation of the Centralized ATFM Facility can be accomplished.

Principles in which ATFM will be based

7.4 Regional ATFM structure should be developed according to agreed upon guidelines as stated herein and in such a manner that each State/Territory and International Organization of the CAR/SAM Regions has access to a Centralized ATFM Facility.

7.5 The implementation of the Centralized ATFM Facility should be based on the following principles:

- a) Be at the disposal of all States/Territories and International Organizations in the region under their responsibility, taking into consideration the requirements of ATFM community members.
- b) Use a common, comprehensive, and permanently updated database.
- c) Take appropriate measures well in advance to accomplish demand and capacity balancing.
- d) Maintain close and continuous coordination with FMUs and/or FMPs, aircraft and airport operators, and other pertinent Centralized ATFM Facilities.
- e) Take measures to ensure that restrictions and delays are equitably balanced among the airspace users.
- f) Apply quality management to the services provided.
- g) Use the collaborative decision making (CDM) process as the basis for developing and implementing ATFM measures.
- h) Favor, to the maximum possible, the use of the existing capacity without compromising safety.
- i) Contribute to the achievement of the global plan initiatives (GPIs).
- j) Provide the flexibility necessary to enable operators to change their arrival or departure schedules, even with short notice.

Functions of a Centralized ATFM Facility

7.6 To provide ATFM service, the Centralized ATFM Facility should:

- a) Establish and maintain a *regional* database that includes:
 - the air navigation infrastructure, ATS units and registered aerodromes;
 - pertinent ATC sector and airport capacity;
 - forecast flight data, etc.
- b) Establish a method for displaying:
 - a chart of forecast air traffic demand;
 - a comparison of *demand and available capacity for pre-determined areas*; and
 - the time-frame of *forecast* air traffic overloads.
- c) Make the appropriate coordination to attempt to increase available capacity, when necessary.
- d) When demand will exceed available capacity, coordinate, communicate, and apply ATFM measures in a timely manner.
- e) Carry out a follow-up on the result of measures adopted.
- f) Coordinate ATFM measures with the other Centralized ATFM Facilities, when so required.

8. Equipment requirements for FMU/FMP and Centralized ATFM Facility

8.1 The implementation of ATFM in the CAR/SAM Regions requires identifying and determining the minimum equipment requirements and communication links for implementing a Centralized ATFM Facility, FMU, and/or FMP.

Note: A detailed description of these requirements is shown in **Appendix B** to this document.

9. Human resource planning and training requirements for FMU/FMP and Centralized ATFM Facility

9.1 Establishment of a Centralized ATFM Facility, FMU, or FMP requires careful human resource planning and training. ATFM training shall be designed to include segments regarding techniques to balance demand and capacity, traffic synchronization, benefits of optimizing traffic flows and creating operational efficiency, techniques for managing change in the operational environment, and the process for ensuring high levels of service to the customers.

10. Operational procedures

10.1 The operational procedures for the Centralized ATFM Facility, FMUs and FMPs should be developed in separate documents. After consultation with all applicable parties, changes, if necessary, shall be agreed upon and published as amendments to operational procedures.

10.2 The purpose of these documents shall be to:

- establish the functions and responsibilities of personnel working in the Centralized ATFM Facility, FMUs and FMPs in regard to implementing flow management service.
- describe the procedures to be used between the Centralized ATFM Facility, FMUs, and FMPs.
- describe the air traffic flow management initiatives and messages that may be applied

10.3 ATFM initiatives should be designed to address specific daily traffic flows, flight series, or specific flights. To this end, traffic management planning, strategy development, and day-to-day monitoring, should be conducted. With regard to the above, ATFM activities should be developed in three phases: strategic - up to 48 hours before the day of the operation; pre-tactical - during 48 hours prior to the operation day; and, tactical - during the day of the operation. During all three ATFM phases, responsible facilities should maintain a close liaison with system stakeholders to ensure efficient and equitable service.

11. ATFM Implementation Strategy

11.1 The operational concept establishes a simple implementation strategy. This strategy should be developed in phases, so as to ensure maximum utilisation of the available capacity and enable all concerned parties to obtain sufficient experience.

11.2 The experience acquired in other Regions and by some States in the CAR/SAM Regions permits States/Territories and International Organizations to apply basic ATFM procedures in airports, without the immediate need for a Centralized ATFM Facility. Such a facility will demand extensive studies to define operational concepts, requirements of systems and institutional aspects for ATFM implementation in the CAR/SAM Regions.

Airports

11.3 Normally the adoption of ATFM strategic measures at airports located in airspaces of low traffic density, avoids congestion and saturation of such airspace. Another aspect to be considered is that the adoption of ATFM strategic measures at airports are simpler to apply, keeping in mind that they only demand a data collection of flight intentions (RPL, Official Airline Guide - OAG, flight lists etc) and reduce use of automation and existing infrastructure tools. In this stage, the airport slot allocation to operators should also consider non-regular flights.

11.4 The implementation process of ATFM in the CAR/SAM Regions should start with the establishment of a common methodology of calculating airport capacity which would enable identification of airports where periods exist in which demand is higher than capacity. With that identification, measures could be adopted with a view to optimise the utilisation of the existing capacity.

11.5 ATFM strategic measures at airports may be limited to the use of Airport Slots with the objective of achieving the balance between the demand of regular flights and airport capacity. The application of slots would ensure a smooth hourly distribution of these flights at airports.

11.6 The necessary capacity for other airspace users (non-regular flights) should also be kept in mind when developing airport slot allocation procedures.

11.7 The evolution of ATFM measures in airports should evolve towards the inclusion of non-regular flights in balancing procedures between demand and capacity. The adoption of ATFM tactical measures in airports would be still of low complexity. However, it would demand an increase in the data

collection program for non-regular flights in order to include these FPLs. Also, in addition to the use of automation tools efficient communications means between with aircraft operators which perform non-regular flights must be established.

11.8 It is expected that ATFM strategic measures at airports will be sufficient to solve specific problems at airports where there is a significant demand of regular flights. ATFM tactical measures would be applied mainly to airports in which a significant amount of non-regular flights are carried out.

Airspace

11.9 From the experience acquired in demand and airport capacity management, States/Territories and International Organizations should consider analysis of airspace capacity, especially in areas where ATFM measures at airports are not sufficient to solve congestion and airspace saturation problems. The ATFM strategic measures should avoid congestion and airspace saturation. The adoption of these ATFM measures would be of low complexity since it would only include their influence in the establishment of airports slots. However, it would demand the use of more sophisticated automation and infrastructure tools, in order to identify congestion or saturation in control sectors.

11.10 It is expected that strategic ATFM measures in the airspace are sufficient to prevent overload of control sectors, mainly in those airspaces in which there is a significant excess demand.

11.11 If demand and capacity balancing cannot be accomplished with the application of ATFM airspace strategic measures, States/Territories and International Organizations should move to more complex solutions. This involves ATFM tactical measures related to airspace, including dynamic procedures that are applied to flights scheduled in the near-term. The adoption of airspace tactical measures would be increasingly complex since it would include the application of slots, based on continuous analysis of the demand and capacity. This analysis would require the use of additional automation and infrastructure tools to those applied in the previous phase, which permit the assignment of slots, addressed to avoid overloads of airspace sectors and airports.

11.12 It is expected that airspace tactical ATFM be implemented only in States/Territories and International Organizations where there is a clear operational requirement, keeping in mind that the complexity of the application of tactical measures in airspace implies a significant investment in automated systems, data bases, telecommunications system and human resources training.

11.13 States/Territories and International Organizations who decide to implement airspace tactical ATFM measures should develop standards, procedures and operational manuals applicable to ATFM service.

Centralized ATFM Facility implementation strategy in the CAR/SAM Regions

11.14 GREPECAS/13 was of the opinion that two CAR and SAM scenarios should be taken into account, but that they could be modified insofar as the operational concept development and the implementation plans progress. The strategy is to develop a harmonized planning of a CAR and SAM interregional ATFM system.

11.15 In order to maximise its efficiency, it was considered that the Centralized ATFM Facility should have the responsibility for providing service to the maximum extension of airspace possible, provided that this is homogeneous. In accordance with ATFM planning in the CAR and SAM Regions, it will have at least two Centralized ATFM Facilities one for each region.

11.16 It was also considered necessary that the procedures during all the implementation process be developed in a harmonious manner among the ATFM Facilities to avoid risking operational safety. This entails establishing a regional and interregional strategy to facilitate and harmonize all the implementation process. The ATFM Task Force will accomplish these planning and harmonization objectives. For implementation, two scenarios will be established depending on the individual operational needs and features of the CAR and SAM Region. The activation of two ATFM Implementation Groups was considered, one for each Region.

11.17 It was considered that operational implementation should be carried out in phases, according to ICAO Doc 9854 – Global Air Traffic Management Operational Concept, in order to permit a progressive implementation and acquire necessary expertise for an adequate implementation

11.18 In order to harmonize the National Plans with the Regional CAR/SAM ATFM Regional Plan, it is highly recommended that the States, Territories and International Organizations take the following required measures: make a closer follow-up of the regional development of the ATFM, prepare an ATFM implementation program, assess the impact that ATFM will have in the national ATM system, and establish pertinent coordinations to accomplish a regionally harmonized implementation.

12 Special flights exempt from application of ATFM measures

12.1 Aircraft that file flight plans as air ambulance flights, humanitarian flights, search and rescue operations, and State aircraft would be exempt from the application of ATFM measures. States would continue to have jurisdiction on these aircraft when they file as domestic flights.

13 Contingency plan

13.1 In case of a partial or total interruption of the flow management service and/or support services, ATFM and FMUs/FMPs will have corresponding contingency plans prepared in accordance with GREPECAS guidelines. These contingency plans will help ensure the safe and orderly movement of air traffic -- although not necessarily efficient -- and the plans will be incorporated into the operational procedures documents associated with the Centralized ATFM Facilities and FMUs/FMPs.

APPENDIX A

Table

Routing Areas and Main Traffic Flows Identified in the CAR/SAM Regions

-1- Routing Area (AR)	-2- Traffic flows	-3- FIRs involved	-4- Type of area	-5- Remarks
Caribbean/South American Regions (CAR/SAM)				
AR 1	Buenos Aires-Santiago de Chile	Ezeiza, Mendoza, Santiago	Low density Continental	SAM intra-regional traffic flow
	Buenos Aires-Sao Paulo/Río de Janeiro	Ezeiza, Montevideo, Curitiba, Brasília	Low density Continental	SAM intra-regional traffic flow
	Santiago de Chile-Sao Paulo/Río de Janeiro	Santiago, Mendoza, Córdoba, Resistencia, Asunción, Curitiba, Brasília	Low density Continental	SAM intra-regional traffic flow
	Sao Paulo/Río de Janeiro-Europe	Brasília, Recife	Continental / Low density Oceanic	SAM/AFI/EUR inter regional traffic flow
AR 2	Sao Paulo/Río de Janeiro-Miami	Brasília, Manaus, Maiquetía, Curacao, Kingston, Santo Domingo, Port au Prince, Habana, Miami	Continental / Low density Oceanic	CAR/SAM/NAM inter- and intra-regional traffic flow
	Sao Paulo/Río de Janeiro-New York	Brasília, Belem, Paramaribo, Georgetown, Piarco, Rochambeau, San Juan (New York)	Continental / Low density Oceanic	CAR/SAM/NAM/NAT inter- and intra-regional traffic flow
AR 3	Sao Paulo/Río de Janeiro- Lima	Brasília, Curitiba, La Paz, Lima	Low density Continental	SAM intra-regional traffic flow
	Sao Paulo/Río de Janeiro-Los Angeles	Brasília, Porto Velho, Bogotá, Barranquilla, Panamá, Central América, Mérida, México, Mazatlán (Los Angeles)	Low density Continental	CAR/SAM/NAM inter- and intra-regional traffic flow
AR 4	Santiago - Lima - Miami	Santiago, Antofagasta, Lima, Guayaquil, Bogotá, Barranquilla, Panamá, Kingston, Habana, Miami.	Continental / Low density Oceanic	CAR/SAM/NAM inter- and intra-regional traffic flow

-1- Routing Area (AR)	-2- Traffic flows	-3- FIRs involved	-4- Type of area	-5- Remarks
	Buenos Aires - New York	Ezeiza, Resistencia, Asunción, La Paz, Porto Velho, Manaus, Maiquetía, Curacao, Santo Domingo, Miami (New York)	Continental / Low density Oceanic	CAR/SAM/NAM/ NAT inter- and intra-regional traffic flow
	Buenos Aires - Miami	Ezeiza, Resistencia, Córdoba, La Paz, Porto Velho, Bogotá, Barranquilla, Kingston, Habana, Miami	Continental / Low density Oceanic	CAR/SAM/NAM NAT inter- and intra-regional traffic flow
AR 5	North of South America - Europe	Guayaquil, Bogotá, Maiquetía, Piarco (NAT-EUR)	Continental / high density Oceanic	SAM/NAT/EUR inter-regional traffic flow
AR 6	Santiago - Lima - Los Angeles	Santiago, Antofagasta Lima, Guayaquil, Central América, México	Low density oceanic	CAR/SAM /NAM intra- and inter-regional traffic flow
AR 7	South America – South Africa	Ezeiza, Montevideo, Brasilia, Johannesburgo (AFI)	Low density oceanic	SAM/AFI inter-regional traffic flow
	Santiago de Chile - Isla de Pascua - Papeete (PAC)	Santiago, Pascua, Tahiti	Low density oceanic	SAM/PAC inter-regional traffic flow
GM-1	Mexico, Toluca, Guadalajara, Monterrey, Mazatlán, La Paz, Acapulco, Puerto Vallarta, Huatulco, Cancún Gulf of Mexico— North America	Mexico, Houston, Miami; Albuquerque; Los Angeles	Continental/oceanic high density	CAR/NAM inter-regional major traffic flow
	Cancún, Guatemala, El Salvador, Nicaragua, Honduras, Costa Rica – Miami	Mexico, Central America, Havana, Miami	Continental/oceanic high density	CAR/NAM interregional traffic flow
GM-2	Mexico, Cancun, La Havana, Nassau — Europe	Mexico, Havana, Miami -NAT-EUR	Continental/oceanic high density Major traffic flow	CAR/NAM/NAT/ EUR inter-regional traffic flow
GM-3	Costa Rica, Panama, Honduras Kingston, Haiti, Santo Domingo San Juan, The Caribbean — Europe	Central America, Panama, Kingston, Port-au-Prince, Curacao, Santo Domingo, San Juan – EUR	Oceanic high density	CAR/ NAT/EUR intra and interregional major traffic flow

-1- Routing Area (AR)	-2- Traffic flows	-3- FIRs involved	-4- Type of area	-5- Remarks
	North America – East Caribbean	New York, Miami, Havana, San Juan, Santo Domingo Piarco	Oceanic high density	West Atlantic Route System CAR/NAM inter- regional traffic flow

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APPENDIX B

General Considerations for the implementation process of a Centralized ATFM

The implementation of the Centralized ATFM should consider the following requirements:

- a) Access to the operational status of the air navigation infrastructure.
- b) Access to aeronautical information and cartography.
- c) Access to meteorological information.
- d) Database of:
 - aerodromes;
 - airport capacity;
 - ATC capacity
 - Air traffic demand
 - Airspace structure
 - Radio navigation aids
 - Aircraft performance; and
 - Utilization of airports and control sectors.
- e) Access to flight planning data (FPL, RPL, etc.).
- f) Flight plans processing.
- g) Access to surveillance data (SSR, ADS, etc.)
- h) Automated resources:
 - Processing and data visualization system for flow management, having, among other thing, the following sub-systems:
 - Flight data processing
 - Airspace and airports structure data;
 - Situation analysis (capacity and demand);
 - Presentation of air traffic situation;
 - Monitoring of the operational status of the infrastructure;
 - Support to collaborative decision making (ATC slots, alternate routes, etc.).
 - Database maintenance.

- i) Communication to coordinate with:
- Other centralized ATFMs
 - Operators (airlines, general aviation, State, etc.);
 - Airport management;
 - FMUs and/or FMPs and/or ATS units;
 - Aeronautical meteorological units;
 - AIS units.
- j) Human resources
- qualified personnel;
 - support personnel;
 - recurrent training.
- k) Use of adequate tools for statistics
- l) Infrastructure
- buildings
 - equipment
 - electrical power
 - air conditioning
 - supplies
 - software
- m) Implementation of FMUs and/or FMPs, as required.
- n) Redundancy of critical systems.

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE**



**ASIA/PACIFIC REGIONAL INTERFACE CONTROL DOCUMENT (ICD)
FOR
ATS INTERFACILITY DATA COMMUNICATIONS (AIDC)**

Version 3.0 - TBD 2007

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Chapter 0 **EXECUTIVE SUMMARY**

0.1 The Asia/Pacific Regional Interface Control Document (ICD) for ATS Interfacility Data Communications (AIDC) is based on the work undertaken by the North Atlantic Systems Planning Group

(NAT SPG) to standardise the interfacility message exchanges (ground/ground data link) needed to support oceanic automation in the North Atlantic Region. The NAT SPG agreed that the ground/ground data interchange should be in accordance with the procedures specified in a common ICD but that the common ICD should identify and detail any regional differences considered necessary.

0.2 The purpose of the ICD is to ensure that data interchange between units equipped with automated ATS systems used for air traffic management (ATM) in the ASIA/PAC Region is harmonised to a common base standard, and that the evolutionary development is coordinated and implemented centrally through the APANPIRG. Therefore, the ICD for the ASIA/PAC Region was developed to address any regional differences but, at the same time, preserve the common base standard set out in the Automatic Dependent Surveillance (ADS) Panel Guidance Material.

0.3 As in the North Atlantic, the ASIA/PAC Region has a great need for a communications and data interchange infrastructure that will significantly reduce the need for verbal coordination between Oceanic Area Control Centres and/or Area Control Centres. ATS Interfacility Data Communications (AIDC) standards, as defined in this document, provide the means by which data interchange between ATS units providing air traffic service in, and adjacent to, the ASIA/PAC Region is harmonised during the notification, coordination, and transfer of control phases of operations.

0.4 The message sets and procedures described in the ICD have been designed for use with the existing Aeronautical Fixed Telecommunications Network (AFTN) and the future Aeronautical Telecommunication Network (ATN). In the interest of global standardisation, ICAO agreed methods and messages were used wherever possible. Where ICAO methods and messages do not meet requirements, new messages were identified using existing ICAO field definitions to the extent possible. Specifically, the ICD defines the following:

- (a) Basic communications and support required to coordinate implementation of AIDC throughout the ASIA/PAC Region;
- (b) Common boundary agreements between all the area/oceanic control centres concerned;
- (c) Implementation guidance material; and
- (d) Relationship to the ICAO OPLINKP (formerly the ADS Panel) AIDC message set.

0.5 The ICD also describes a configuration management process which will ensure stability in the design and implementation of the messages described herein. As agreed, this process is applicable and adopted by Asia Pacific Provider States along with the ICD guidance material.

Chapter 1 **FOREWORD**

1.1 HISTORICAL

1.1.1 In 1971, States in the North Atlantic (NAT) Region initiated action to begin the automation of flight data exchanges between Oceanic Area Control Centres (OACs) using On-Line Data-Interchange (OLDI) techniques. These techniques were not standard nor indeed even compatible, and it was agreed that to get full benefits from the application of OLDI, regional standardisation must be achieved.

1.1.1.1 OLDI was defined as system to system interchange of data with controller notification and presentation when necessary. It was not seen as a means where by controllers could effectively send and receive electronic mail.

1.1.2 At its twenty-fifth meeting (Paris, September 1988), the North Atlantic Systems Planning Group (NAT SPG) established a Task Force to develop a future ATS system concept for the whole of the NAT Region (NAT SPG/25, Conclusion 25/11 refers).

1.1.2.1 Today there are two types of OLDI in use, one known as European OLDI and the other known as NAT OLDI. The message sets differ to some degree with the European OLDI being simpler and oriented toward minimal controller interaction. The NAT OLDI message set includes messages which require manual intervention.

1.1.3 At its twenty-seventh meeting (Paris, June 1991), the NAT SPG noted that the draft ICD was sufficiently mature to be used for planning purposes and therefore agreed that States should endeavour to replace agreements that existed at the time with the common ICD by the end of 1991. Subsequent work within the NAT SPG upgraded the ICD to better match automation and communications transition requirements.

1.1.4 On the basis of the above, the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG), at its fifth meeting in 1994, undertook the task of developing the inter-facility message exchanges needed to support automation in the regions.

1.1.5 The ICAO OPLINK Panel then adopted the AIDC message set and included it as guidance material.

1.1.6 At the thirteenth meeting of APANPIRG (Bangkok, September 2002) decision 13/9 was made to reconvene the AIDC Task Force to undertake the reviewing and updating of the ASIA/PAC AIDC Interface Control Document (ICD).

1.1.7 The AIDC Review Task Force met in Brisbane on the 27th and 28th of March 2003. Discussions within the Task Force revealed inconsistencies between existing AIDC ICDs containing the same version number. The Task Force decided to baseline a document based on the original printed ICAO document.

1.1.8 As a result of this meeting the ASIA/PAC Regional ICD for AIDC was updated to include:

- Additional clarification of certain message types;
- Improved consistency of the terminology used in the document;
- Incorporation of recent changes proposed changes to PANS-ATM Doc. 4444 and Doc. 9694, regarding additional optional sub-fields in ICAO Field 14; and

- Proposed additional message types, namely the Application Status Monitor (ASM), the FANS Application Notification (FAN) and the FANS Completion Notification (FCN).

1.1.9 Version 2.0 of the Asia/Pacific Regional ICD for AIDC was adopted by APANPIRG/14 in August 2003 under the Conclusion 14/3.

1.1.10 At the seventeenth meeting of APANPIRG (August 2006) Decision 17/13 was taken to reconvene the AIDC Task Force to complete the outstanding task of defining the format of the FAN message and addressing other outstanding issues identified in the ASIA/PAC AIDC Interface Control Document (ICD) Version 2.0.

1.1.11 The AIDC Task Force met in Bangkok 6-9 February, 2007.

1.1.12 As a result of this meeting, in addition to editorial changes, the ASIA/PAC Regional ICD for AIDC was updated to include:

- a) specific error messages in Appendix B, Table B-1 associated with V2.0 functionality.
- b) clarification of some formats to avoid the possibility of differing interpretations.
- c) the format of the FANS message.
- d) modification of the format of the FCN message to permit greater flexibility in its application.
- e) the format of the ADS message.
- f) the format and use of the TRU message.

1.1.13 Version 3.0 of the Asia/Pacific Regional ICD for AIDC was adopted by APANPIRG/18 in September 2007 under the Conclusion **TBD**.

Chapter 2

THE DOCUMENT**2.1 INTRODUCTION**

2.1.1 The ASIA/PAC Interface Control Document (ICD) for ATS Interfacility Data Communications is divided into the following Parts:

2.2 PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT

2.2.1 This part provides an overall philosophical view of the ICD, general information concerning the units that are used and information on data that is applicable to all ATSUs (Air Traffic Services Units).

2.3 PART II - COMMUNICATIONS AND SUPPORT MECHANISMS

2.3.1 This part describes the technical and other requirements needed to support AIDC. It also indicates that a longer term strategy for the transition to the ATN needs to be developed.

2.4 APPENDICES

2.4.1 Appendices include, inter alia, implementation guidelines which are relevant for software engineers, and a cross-reference to the ICAO OPLINKP AIDC message set, descriptions of messages used to exchange ATS data between automated ATS Systems, templates for typical bilateral letters of agreement when implementing AIDC, a list of error messages, and a Glossary of Terms.

2.5 LIST OF ACRONYMS

ABI	Advance Boundary Information (AIDC message)
ACARS	Aircraft Communication Addressing and Reporting System
ACC	Area Control Centre
ACI	Area of Common Interest
ACP	Acceptance (AIDC message)
ADS	Surveillance ADS-C (AIDC message)
ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-C	Automatic Dependent Surveillance - Contract
AFN	ATS Facilities Notification
AFTN	Aeronautical Fixed Telecommunications Network
AIDC	ATS Interfacility ASIA/PAC Data Communications
AOC	Airline Operational Control; or —Assumption of Control (AIDC message)
AMHS	ATS Message Handling System
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
ARINC	Aeronautical Radio Inc.
ARTCC	Air Route Traffic Control Center
ASIA/PAC	Asia/Pacific
ASM	Application Status Monitor (AIDC message)
ATC	Air Traffic Control
ATSC	Air Traffic Service Centre
ATM	Air Traffic Management
ATMOC	Air Traffic Management Operations Centre
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit
C-ATSU	Controlling ATSU
CDN	Coordination (AIDC message)

CHG	ICAO Modification Message
CPDLC	Controller Pilot Data Link Communications
CPL	Current Flight Plan (AIDC message)
CRC	Cyclic Redundancy Check
D-ATSU	Downstream ATSU
DIA	Coordination Dialogue
EMG	Emergency (AIDC message)
EST	Coordination Estimate (AIDC message)
ETX	End of Text
FAN	FANS Application Message (AIDC message)
FANS (also FANS-1/A)	Future Air Navigation System
FCN	FANS Completion Notification (AIDC message)
FCO	Facilities Notification Contact
FI	Flight Identifier
FIR	Flight Information Region
FMC	Flight Management Computer
FMD	Flight Management Computer (Selected)
FMH	Facilities Notification Message Header
FML	Flight Management Computer (Left)
FMR	Flight Management Computer (Right)
FOM	FANS Operations Manual
FPL	Filed Flight Plan
FN_CAD	Contact Advisory
FPO	Facilities Notification Current Position
IA-5	International Alphabet 5
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
IGM	Implementation Guidance Material
IMI	Imbedded Message Identifier
LAM	Logical Acknowledgement Message (AIDC message)
LOA	Letter of Agreement
LRM	Logical Rejection Message (AIDC message)
MAC	Coordination Cancellation (AIDC message)
MIS	Miscellaneous (AIDC message)
MTI	Message Type Identifier
NAT	North Atlantic
NDA	Next Data Authority (CPDLC message); or Next Data Authority (Next unit that will communicate with the aircraft using CPDLC)
OAC	Oceanic Area Control Centre
OCS	Oceanic Control System
ODF	Optional Data Field
OLDI	On-Line Data-Interchange
OPLINKP	Operational Data Link Panel
OSI	Open System Inter-connection
PAC	Preactivation (AIDC message)
PANS-ATM	Procedures for Air Navigation Services - Air Traffic Management
REJ	Rejection (AIDC message)
R-ATSU	Receiving ATSU
RNP	Required Navigation Performance
SARPs	Standards and Recommended Practices
SITA	Societe Internationale de Telecommunications Aeronautiques
SMI	Standard Message Identifier

SOH	Start of Header
STX	Start of Text
TCP	Transfer of Control Point
TDM	Track Definition Message (AIDC message)
TEI	Text Element Identifier
TOC	Transfer of Control (AIDC message)
TRU	Track Update (AIDC message)
UTC	Universal Coordinated Time
VSP	Variable System Parameter

PART I - PURPOSE, POLICY AND UNITS OF MEASUREMENT**1. PURPOSE**

1.1 The purpose of the document is to ensure that data interchange between ATSUs providing air traffic services in, and adjacent to, the ASIA/PAC Region is harmonised to a common standard and to ensure that evolutionary development is encouraged and coordinated centrally. It also provides a description of the message types and methods of communication.

1.2 In the context of this document, the definition of AIDC is as follows:

The AIDC application supports information exchanges between ATC application processes within automated ATS systems located at different ATSUs. This application supports the Notification, Coordination, and the Transfer of Communications and Control functions between these ATSUs.

1.3 In the interest of global standardisation, ICAO agreed methods and messages are used wherever possible. Where ICAO methods and messages do not meet requirements, new messages were identified using existing ICAO field definitions to the extent possible.

2. SCOPE

2.1 This document specifies the facilities and messages to be used within the ASIA/PAC region for the exchange of notification, coordination, transfer and related data between automated ATS systems.

2.2 The messages defined in this document are used during the various stages of the flight. Though outside the scope of the AIDC application, the Emergency, Flight Planning and Supplementary Message Categories as defined in ICAO Doc 4444 Appendix 3 will continue to be used to perform functions not provided by the AIDC application.

2.3 In particular, the Flight Planning function is required and will be required in the future to support operations within the ASIA/PAC Region. The ICAO messages FPL (Filed Flight Plan), CHG (Modification), DLA (Delay), DEP (Departure), ARR (Arrival), CNL (Cancel) and RQP (Request Flight Plan) will be used to support this function.

3. POLICY**3.1 Document amendment**

3.1.1 Parts I and II of this ICD are under configuration control and are administered by the ICAO ASIA/PAC Regional Office in conjunction with APANPIRG. Changes to Parts I and II of the document shall only be made as a result of agreement by APANPIRG. Requested changes to the Appendices shall be relayed to the ICAO Regional Office in Bangkok, who will circulate requested proposed changes to all States in the Regions for comment and, subject to unanimous agreement, the Regional Office will amend such document accordingly.

3.2 System philosophy

3.2.1 The application of AIDC in the ASIA/PAC Region shall be based on a step-by-step data distribution scheme comprising three phases: Notification, Coordination and Transfer of Control.

3.2.1.1 The capability to revert to manual coordination shall be retained.

3.2.2 In support of all the operational phases, application management messages are required to support application level dialogue between automated ATS systems.

3.2.3 Flight plans shall continue to be filed in accordance with existing procedures.

3.2.4 A functional address, which refers to a function within an OAC/ACC (e.g. an ATC watch supervisor), may be substituted in certain messages for the aircraft identification found in Field 7. Where such an address is used, it is preceded by an oblique stroke (/) to differentiate it from an aircraft identification.

4. UNITS OF MEASUREMENT

4.1 Introduction

4.1.1 In general the AIDC ICD messages support different units of measurement. Bilateral agreements should determine the units to be transmitted.

4.2 Time and date

4.2.1 All times shall be expressed in UTC as four digits, with midnight expressed as 0000. Dates, when used, shall be in the form of YYMMDD.

4.3 Geographic position information

4.3.1 Geographic position information shall be in accordance with the provisions contained in the *Procedures for Air Navigation Services Air Traffic Management (PANS-ATM, Doc 4444)*.

4.4 Level and speed information

4.4.1 Level and speed information shall be specified in accordance with ICAO PANS-ATM Doc 4444 with the following exceptions applying only to Field 14 or the Track Data field in a TRU message.

Note. When including more than one of the optional formats described below in the same AIDC message, the order that the data is incorporated into Field 14 is the order that it is described below. For example, if an AIDC message was to include a block level and an assigned Mach Number, the block level information would precede the Mach Number information.

4.4.1.1 Block level information

4.4.1.1.1 In certain circumstances, a vertical range of levels may be transmitted. Where a vertical range of levels is used, it shall be specified as a lower level followed by the upper level.

Ex1. MINNY/2125F320F340 The aircraft is operating in a block of levels between F320 and F340 (inclusive).

4.4.1.1.2 When transmitting a level restriction, only a single level may be included within the restriction.

Ex2. ELMER/0244F310F350F290A The aircraft is cleared to operate in a block of levels between F310 and F350 and will cross ELMER at or above F290.

4.4.1.1.3 The coordination of a vertical range of levels by AIDC should only be made following bilateral agreement.

4.4.1.2 Mach Number Technique information

4.4.1.2.1 The boundary estimate may contain additional clearance information describing a Mach Number that has been assigned to an aircraft. If transmitted, the Mach Number information

shall always follow directly after the level information and be separated from the level information by a forward slash delimiter (/). This information shall contain:

- a single character providing advice as to whether an aircraft will be maintaining the notified Mach Number or less (L), the notified Mach Number or greater (G), or exactly the notified Mach Number (E); and
- four characters defining the notified Mach Number, expressed as the letter M followed by 3 numerics.

Ex1. BUGGS/0349F350F370/GM085 The aircraft is operating in a block of levels between F350 and F370 (inclusive) maintaining M0.85 or greater.

Ex2. PLUTO/0215F310/EM076 The aircraft is maintaining M0.76

4.4.1.2.2 The absence of speed information in the boundary estimate data of an AIDC message indicates that the previously assigned speed has been cancelled.

Ex3. SPEDY/1237F310F330B/LM083 The aircraft is cleared to F310 and will cross SPEDY at or below F330, maintaining M0.83 or less;

subsequently followed by:

Ex4. SPEDY/1238F310 The aircraft will no longer be on descent at SPEDY, and has resumed normal speed (and one minute later than previously coordinated)

4.4.1.2.3 The format described for the notification and coordination of Mach Number in this section applies to Field 14 – boundary estimate data – only. It may be transmitted in any AIDC message containing Field 14.

4.4.1.2.4 The coordination of Mach Numbers by AIDC should only be made following bilateral agreement

4.5 Offset and weather deviation information

4.5.1 The boundary estimate may contain additional clearance information describing an offset or weather deviation that has been issued to an aircraft. If transmitted, the offset and weather deviation information shall always be the last information in the group and shall be separated from preceding information by a forward slash delimiter (/). This information shall contain:

- a single character providing advice as to whether the clearance is an offset (O) or a weather deviation (W); and
- One to three characters indicating an off track distance associated with this clearance (leading zeros shall not be used); and
- a direction, indicating left (L), right (R) or either side of track (E)

Example 1. GOOFY/2330F310/GM084/O30R The aircraft is offsetting 30NM right of track, maintaining M0.84 or greater.

Example 2. DAFFY/0215F310F350/W25E The aircraft is operating in a block of levels between F310 and F350 (inclusive) deviating up to 25NM either side of track.

Example 3. DAFFY/0215F310F350/W5E The aircraft is operating in a block of levels between F310 and F350 (inclusive) deviating up to 5NM either side of track.

Example 4. DAFFY/0215F310F350/W100E The aircraft is operating in a block of levels between F310 and F350 (inclusive) deviating up to 100NM either side of track.

4.5.2 The absence of offset or weather deviation data in the boundary estimate data of an AIDC message indicates that any previously notified or coordinated off track clearance no longer applies.

Example 5. MICKY/1519F330/W15R The aircraft is deviating up to 15NM right of track

subsequently followed by:

Example 6. MICKY/1520F330 The aircraft is back on track (and one minute later than previously coordinated)

4.5.3 The off-track clearance format described in this section applies only to Field 14 – boundary estimate data – or the Track Data field in a TRU message. It may be transmitted in a TRU message or any AIDC message containing Field 14.

4.5.4 When an aircraft is offsetting or deviating, the coordination point in the boundary estimate data shall be the coordination point based on the nominal route rather than any calculated boundary point based on the offset route.

4.5.5 When including Offset information in an AIDC message, the direction “E” (either side of track) shall not be used.

4.5.6 Valid “off track” distance values are integers between 1 and 250, with no leading zeros. The off track distance is measured in nautical miles (NM).

4.5.7 The coordination of offsets and weather deviations by AIDC should only be made following bilateral agreement.

5. RESTRICTION FORMATS

5.1 Level and speed restrictions

5.1.1 Use of restrictions is not mandatory. If they are used the following convention shall be used.

5.1.2 Route, speed and level information contained in the Route field (ICAO ATS Field 15) represents the current cleared profile. Where a clearance requires a speed/level change subsequent to a route point, then the ICAO convention of route point followed by an oblique stroke and the new speed/level will be used (Ex. 1). Where a clearance requires a speed/level change to be completed by a route point, then the items will be reversed (Ex. 2).

5.1.3 A combination of these two conventions will describe a clearance with a defined starting and completion point (Ex. 3).

Ex. 1 60N010W/M084F350

Ex. 2 M084F350/62N020W

Ex. 3 60N010W/M084F350/62N020W

5.2 Time restrictions

5.2.1 There are three types of time restrictions, describing when an aircraft should arrive at a fix:

- a) AT;
- b) AT OR BEFORE; or
- c) AT OR LATER.

5.2.2 A suffix will be added to the four digit time to denote the restriction type, as follows:

- a) AT: 'A', e.g. 1230A;
- b) AT OR BEFORE: 'B', e.g., 1230B; or
- c) AT OR LATER: 'L', e.g., 1230L.

5.2.3 The restriction itself will begin with a slash, i.e., '/', e.g., /1230B, and will appear after the fix with which it is associated. For example,

49N050W/1230L

signifies that the aircraft should arrive at 49 N 50 W at or later than 1230 pm.

5.2.4 A time restriction may be used in conjunction with speed/level restrictions as follows:

60N010W/M084F350/1230L
M084F350/62N020W/1230A
60N010W/M084F350/62N020W/1230B

5.2.5 Time restrictions may only appear in the Route field (Field 15).

5.2.6 The use of time restrictions shall be bilaterally agreed between ATS providers.

PART II - COMMUNICATIONS AND SUPPORT MECHANISMS

1. INTRODUCTION

1.1 Coordination communications are divided into two areas; one addresses the need for voice communications between ATSUs whereas the other addresses the need for data communications. It is anticipated that the continuing implementation of automated data communications between ATSUs will result in a reduction in the utilisation of voice communications.

2. MESSAGE HEADERS, TIMERS AND ATSU INDICATORS

2.1 Message Headers

2.1.0 **General.** AFTN IA-5 Message Header, including the use of the Optional Data Field defined in Annex 10, Volume II and herein, will be employed for the exchange of all ATS data in the region. The AFTN priority indicator FF shall normally be used for all data exchanges.

2.1.1 **Optional Data Field.** The optional data field provides a flexible way to convey information on an end-to-end basis, undisturbed by the communication processes along the path. Since the information is optional it is necessary to specify a unique number and ending for each defined use. Option 1 has already been allocated for additional addressing use, and will be found in ICAO Annex 10, Volume II in due course. Option numbers 2 and 3 have been defined for computer applications to convey message/data unit identification and message/data unit reference information, respectively, and are adopted in this ICD. Other options can be defined and added as the need arises. The proposed encoding would have no impact on AFTN switching centers as they ignore this part of the origin line.

2.1.2 **Addressing.** The Source and Destination addresses of the AFTN header convey the direction and logical identity of the application processes exchanging AIDC information (data). The application process must be aware of the AFTN addresses that are used for this function. The first four characters form the location, while the next three characters specify an office/agency or a processor at the given location. The eighth character of the address indicates the end system application and details of the naming assignment are contained in Appendix C. This approach allows up to 26 multiple applications to be co-hosted in the same processor, each having its own unique address. This implementation will make the addressing consistent with Open System Inter-connection (OSI) parameters and simplify the transition to the ATN.

2.1.3 **Message/Data Identification Number.** The message/data identification number is a six (6) digit number, taken from a single application pool of available numbers. The identification of the sending and receiving units would use the normal 8-character addresses of the AFTN header.

2.1.3.1 The message/data identification number is encoded and conveyed in the AFTN message header Optional Data Field (ODF), option 2. The AFTN implementation provides functionality consistent with the OSI primitive/parameter structure.

2.1.3.2 A message/data identification number will be assigned to each message/data unit requiring confirmation of receipt by the initiating processor. This number will be assigned on an application process basis in such a way as to guarantee a unique identification number for a period of time as specified in paragraph 2.1.6. For messages/data not requiring confirmation the message/data identification parameter shall not be used.

2.1.4 **Reference Information.** The message/data reference information is a way of linking a message/data unit to a previously sent message. This function is encoded and conveyed in the AFTN ODF, option 3. This implementation would make the linking information consistent with the abstract OSI protocol primitive/parameter structure. The reference information consists of the message/data identification number of the previously sent message/data unit being referenced. As the previous message being referenced could have been originated by either processor the location indicator of the message source shall be used as a prefix to the reference number.

2.1.5 **Time Stamp.** The time stamp is expressed as 12 digits in year, month, day, hours, minutes, and seconds (YYMMDDHHMMSS). The high precision (seconds) of the time stamp will support computation of transmission delays. This data item is conveyed as option 4 of the ODF.

2.1.6 **Cyclic Redundancy Check (CRC).** The CRC is a four digit hexadecimal number that is used to ensure end-to-end message integrity. The CRC employed is the CRC-CCITT. The CRC is computed over the message text, from the beginning left parenthesis to the closing right parenthesis, inclusive. Non printable characters such as line feeds and carriage returns shall be excluded from the CRC calculation. This data item is conveyed as option 5 of the ODF.

2.2 Timers

2.2.1 In order to guarantee the uniqueness of the message/data identification number, and yet allow for the efficient reuse of the numbers in the pool, two timers are required for each message/data unit requiring confirmation: accountability and reuse.

2.2.2 **Accountability Timer.** The accountability timer determines the maximum period of time for the responding application to confirm receipt of a given message/data unit. The default value for this timer nominally shall be three minutes. If there is no valid response from the responding application the initiating processor shall retransmit the message/data unit (and reset the timer), or initiate local recovery procedures. When local procedures allow retransmission a maximum value, such as three, must be determined before local recovery procedures are initiated. The accountability timer shall be cancelled by the receipt of any message with the appropriate message/data reference identifier, which will typically be a LAM or LRM. Retransmissions use the same message/data identification number as the original message/data unit.

2.2.3 **Reuse Timer.** The reuse timer function employs two timers that determine the minimum period of time during which a message/data identification number is guaranteed to be unique. Reuse timer A shall be set for exchanges not involving dialogues between processors. The range for reuse timer A shall be from 1 to 30 minutes, in one minute increments. The default value for reuse timer A shall be 5 minutes, or as agreed for communicating applications by the concerned administrations. Reuse timer B shall be set for exchanges where a dialogue is involved in the exchange. The range for reuse timer B shall be 2 to 90 minutes, in one minute increments. The default value for reuse timer B shall be 10 minutes, or as agreed for communicating applications by the concerned administrations. A given message/data identification number can be reused when an ACP, AOC, or REJ response message is received or the reuse timer has expired.

2.2.4 **System Failure Timer Procedures.** In the event of system failure the accountability and reuse timers will be reset and resume timing upon completion of system recovery.

2.2.5 **Example.** The following examples depict two ASIA/PAC Core Messages encoded in accordance with the previous procedures. The second message is a reference to the first message. SOH, STX, message ending and ETX characters are omitted for clarity, as are the alignment functions.

```
FF NFFFZOZO
122145 KZOA ZOZO 2.000033-4.940412214523-5.A34B-
(CPL-UAL714-IS-B747/H-S/C-KLAX-05S179W/2220F370-M082F370(route data)-YSSY-0)
```

Explanation: Sending an initial coordination message (number 000033 from Oakland (KZOA ZOZO) to Nadi (NFFFZOZO) at time 940412 214523.

```
FF KZOA ZOZO
122147 NFFFZOZO 2.000044-3.KZOA000033-4.940412214703-5.DE6A-
(ACP-UAL714-KLAX-YSSY)
```

Explanation: Fiji (NFFFZOZO) accepts the proposed coordination condition received from Oakland (KZOAZOZO) by sending message number 000044 from NFFFZOZO to KZOAZOZO at 940412214703. The message refers to message 000033 sent earlier by KZOAZOZO

2.3 **ATSU Location Indicators**

2.3.1 ICAO location indicators must be used by automated ATSUs in AIDC messages.

3. **ENGINEERING CONSIDERATIONS**

3.1 **Future Communications**

3.1.1 The future data communications infrastructure should be compatible with the ICAO ATN.

3.1.2 Until the ATN becomes available, the engineering details needed to implement the exchange of messages contained in Appendix A will need to be agreed to bilaterally and identified in Appendix D.

3.2 **ATN Transition Support**

3.2.1 The AFTN will provide the underlying communications network and services within the ASIA/PAC region in the near-term. Communication services provided by the ground element of the ATN will be eventually employed by the AIDC application.

3.2.2 The APANPIRG ATN—Implementation Coordination Group (ICG) is currently considering the continued use of AFTN format for AIDC application in the Asia/Pacific region. When the ATS Message Handling System (AMHS) has been implemented, the exchanges of AFTN messages on ATN can be accomplished using the AFTN/AMHS gateway function of the AMHS application. This mechanism can be used to exchange the AFTN AIDC messages providing that the connection has been tested to meet the recommended performance criteria in Appendix D.

3.2.3 The ASIA/PAC region will comply with ATN SARPs. A summary of these SARPs specifically relevant to ASIA/PAC operations, including addressing conventions and encoding rules, will be included within the document.

3.3 **Performance Criteria**

3.3.1 If AIDC messages are not transmitted and received in a timely manner between automation systems, aircraft can potentially cross boundaries without coordination or transfer of control responsibility taking place. The benefits of AIDC are also severely reduced if link speeds and transit times are inadequate.

3.3.2 In order to effectively use the AIDC application for the interchange of ATC coordination data, performance requirements need to be specified. These specified performance requirements need to be agreed to by neighbouring states implementing AIDC. Recommended performance figures are specified in Appendix D.

3.4 **Recording of AIDC data**

3.4.1 The contents and time stamps of all AIDC messages shall be recorded in both end systems in accordance with the current requirements for ATS messages.

3.4.2 Facilities shall be available for the retrieval and display of the recorded data.

APPENDIX A - ATS COORDINATION MESSAGES

1. INTRODUCTION

1.1 The following sections describe those messages used by ASIA/PAC ATS systems for On-Line Data Interchange. These core messages are a selection from the AIDC message set developed by the ICAO – OPLINK Panel. Unless otherwise indicated in this document, message fields will conform to ICAO field definitions (PANS-ATM Doc 4444), and are referred to by field number. All ATS data shall be enclosed between parentheses. Only one ATS message shall be included within a transmission. An overview of all ASIA/PAC core messages and their composition can be found in Table A-2.

1.2 Coordination and the further route of flight

1.2.1 Field 15 shall include subfields 15a, 15b and 15c. It shall describe the cleared route, beginning with the last significant point preceding the coordination point. It will contain all known cleared route information. As a minimum, it shall contain the first significant point in the adjacent ATSU's airspace. If the cleared route of flight is not known completely to destination, the truncation indicator shall appear after the last known significant route point. For example:

1. M083F340 SALAG B333 PUGEL/M083F360 T
2. M083F300 DCT FICKY B200 TATAS T

Note 1: In accordance with PANS-ATM Doc 4444 the truncation indicator shall only follow a significant point or significant point/Cruising Speed and Cruising level in Field 15 and shall not follow an ATS route designator.

Note 2. ATSUs should be aware of the risks associated with simply deleting an unknown waypoint or route without using correct truncation procedures. Deletion of a waypoint or route will result in erroneous route information being transmitted to downstream ATSUs.

1.3 Field 3 Requirements

1.3.1 All messages shall use field 3a only.

1.3.2 Fields 3b and 3c are not used since, for AIDC, these reference numbers are included in the ODF, option 3. See Part 2, paragraph 2.1.4.

1.4 Field 7 Requirements

1.4.1 Where Field 7 is required to be present in a message, Field 7a (Aircraft Identification) shall be mandatory. Fields 7b (SSR Mode) and 7c (SSR Code) are optional but shall always be present where the information is available and applicable.

2. MESSAGE GROUP

2.0 The core messages shown in Table A-1 below are to be supported by all ASIA/PAC ATS Providers using automated data interchange.

2.0.1 Optional messages may be supported by ATS providers. Such messages will be detailed in bi-lateral agreements.

Table A-1. ASIA/PAC AIDC Messages

Core	Opt	Message Class	Message
X		Notification	ABI (Advance Boundary Information)
X		Coordination	CPL (Current Flight Plan)
X			EST (Coordination Estimate)
X			MAC (Coordination Cancellation)
	X		PAC (Preactivation)
X			CDN (Coordination)
X			ACP (Acceptance)
X			REJ (Rejection)
	X		TRU (Track Update)
X		Transfer of Control	TOC (Transfer of Control)
X			AOC (Assumption of Control)
X		General Information	EMG (Emergency)
X			MIS (Miscellaneous)
	X		TDM (Track Definition Message)
X		Application Management	LAM (Logical Acknowledgement)
X			LRM (Logical Rejection Message)
	X		ASM (Application Status Monitor)
	X		FAN (FANS Application Message)
	X		FCN (FANS Completion Notification)
	X	Surveillance Data Transfer	ADS (Surveillance ADS-C)

2.1 Notification messages

2.1.1 ABI (ADVANCE BOUNDARY INFORMATION)

2.1.1.1 Purpose

Used to give advance information on flights and shall be transmitted at a bilaterally agreed time or position (Variable System Parameter) before the common boundary. Changes to a previously transmitted ABI shall be communicated by means of another ABI. Changes to the cleared route of flight will result in the retransmission of an ABI.

2.1.1.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate data
16	Destination aerodrome
22	Amendment

Field 22 shall contain as a minimum the following fields:

9	Number, type of aircraft and wake turbulence category
15	Route (see Appendix A, paragraph 1.2.1)

Field 22 may also optionally include any or all of the following fields:

8	Flight rules
10	Equipment
18	Other information. Note that this field shall contain information as received by the sending centre or a subset thereof as agreed between the parties

Subject to bilateral agreement, the following field may also be included in Field 22:

Text	Amended Destination

2.1.1.3 Amended Destination is a free text field that may be used in the ABI message to notify an amended destination aerodrome. The field consists of an identifier (“DEST”) followed by a delimiter “/” character, followed by the name or the location of the new destination. When used, the Amended destination field is the last field within Field 22.

2.1.1.4 *Example(s)*

- (i) (ABI-THA179-EGLL-15N0090E/0700F330
-VTBD-8/IS-9/B747/H-10/S/C-15/14N093W 13N097W YAY T-18/0)
- (ii) (ABI-QFA43-YSSY-ESKEL/0300F330-NZAA-8/IS-9/B744/H-10/SIDHJRW/CD-
15/SY L521 ESKEL TANEN WN-DEST/NZWN)

The second example shows an ABI following a diversion from the original destination (NZAA) to a new destination (NZWN).

2.1.2 More information concerning the usage of the Amended Destination field is contained in Appendix D – *Implementation Guidance Material*.

2.2 Coordination messages**2.2.1 CPL (CURRENT FLIGHT PLAN)****2.2.1.1 Purpose**

Used to initiate initial coordination dialogue between automated ATS systems for a specific flight.

2.2.1.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
8	Flight rules
9	Aircraft type
10	Navigation equipment
13	Departure aerodrome
14	Boundary estimate data
15	Route (see Appendix A, paragraph 1.2.1)
16	Destination aerodrome
18	Other information

2.2.1.3 Example

(CPL-QFA811-IS-B767/H-S/C-WSSS-20N070E/1417F350-M080F350 30N060E 40N090E YAY T-EGLL-0)

2.2.2 EST (COORDINATION ESTIMATE)**2.2.2.1 Purpose**

Used to inform the receiving centre of the crossing conditions for a flight and to indicate that the conditions are in compliance with agreements between the two parties. An ACP message shall be transmitted to complete the coordination process. The only valid response to an EST is an ACP.

2.2.2.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate data
16	Destination aerodrome

2.2.2.3 Example

(EST-QFA811/A2277-WSSS-20N070E/1417F350-YAYT)

2.2.3 PAC (PREACTIVATION)

2.2.3.1 *Purpose*

Used to inform the receiving centre of the crossing conditions for a flight which has not yet departed and to indicate that the conditions are in compliance with agreements between the two parties. Normally it is only used when the departure point is close to the FIR boundary and preflight coordination is required.

Note: On receipt of a PAC message an ACP message is required to be transmitted to complete the coordination process. The only valid response to a PAC is an ACP.

2.2.3.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
14	Boundary estimate data
16	Destination aerodrome
22	Amendment (optional field)

Field 22 may optionally include any or all of the following fields:

8	Flight rules
9	Number, type of aircraft and wake turbulence category
10	Equipment
15	Route (see Appendix A, paragraph 1.2.1)
18	Other information. Note that this field shall contain information as received by the sending centre or a subset thereof as agreed between the parties

2.2.3.3 *Example*

(PAC-QFA811/A2277-WSSS-20N070E/1417F350-YAYT-10/S/C)

2.2.4 MAC (COORDINATION CANCELLATION)

2.2.4.1 *Purpose*

Used specifically to indicate to a receiving centre that all notification and/or coordination received for a flight is no longer relevant to that centre. This message is not to be considered as a CNL message.

2.2.4.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
22	Amendment (optional field)

Field 22 may only contain the following fields:

14	Boundary Estimate Data
18	Other Information

Field 14 may be transmitted containing the boundary estimate data previously transmitted. It may be used if required, to correctly identify the flight concerned by the MAC, when appropriate. If a MAC is transmitted as a result of a diversion to a new destination (i.e. such that the receiving ATSU is no longer affected by the flight), Field 16 – Destination aerodrome – should contain the destination contained in the original Notification and/or coordination messages.

2.2.4.3 *Examples*

- (i) (MAC-SIA286-NZAA-WSSS)
- (ii) (MAC-THA989-VTBD-YMML-18/RMK/DIVERTED TO YPDN)
- (iii) (MAC-FJI910-YSSY-NFFN-14/DUBEV/2330F370)

2.2.5 CDN (COORDINATION)

2.2.5.1 *Purpose*

Used to propose changes to the coordination conditions agreed to in a previously transmitted CPL, EST, PAC or CDN message. Only one CDN dialogue can be active per flight at any given time between the same two ATSU's (refer App D paragraph 3.2.5). The initial coordination dialogue is always terminated by an ACP message; otherwise a unit receiving a CDN can indicate that the coordination conditions should be left as previously agreed by transmitting an REJ message. CDN dialogues should be closed prior to the Transfer of Control occurring.

ATSUs should ensure that appropriate procedures are defined in bilateral Letters of Agreement for dealing with CDN messages containing a number of revisions (e.g. a revised estimate and level). There may be occasions when the receiving ATSU can accept one of the amendments but not the other.

2.2.5.2 *Message Format*

ATS field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
22	Amendment

Under normal circumstances, Field 22 may only contain fields 14, 15 and 18. Subject to bilateral agreement, the following fields may also be included in Field 22:

10	Equipment
Text	Amended Destination

2.2.5.3 Amended Destination is a free text field that may be used in the CDN message to propose the coordination of a new destination aerodrome. The field consists of an identifier ("DEST") followed by a "/" character, followed by the name or the location of the new destination. When used, the Amended destination field is the last field within Field 22.

2.2.5.4 *Examples*

- (i) (CDN-NWA36-NFFN-RJTT-14/20N150E/0446F370)
- (ii) (CDN-QFA1-YSSY-WSSS-10/SDGHIJRYZ/SD)
- (iii) (CDN-KAL823-RJAA-NZCH-15/LTO G591 AA-DEST/NZAA)
- (iv) (CDN-MAPLE1-PKMJ-ZZZZ-14/MARTI/2200F310-15/MARTI 02N168E-DEST/0150N16745E)

2.2.5.5 The last two examples demonstrate a CDN proposing a new route to an amended destination. In example (iii), there was no change to Field 14 – Boundary estimate data. Example (iv) shows a change of route with a corresponding change to Field 14. The “DEST/” included in Example (iv) refers to the proposed destination, rather than the original “ZZZZ” destination. Refer to Appendix D for the methodology in proposing a diversion to a new destination.

2.2.6 ACP (ACCEPTANCE)

2.2.6.1 *Purpose*

Used to confirm that the contents of a received CPL, CDN, EST or PAC message are accepted. ACP messages may be generated automatically or manually.

2.2.6.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

2.2.6.3 *Example*

(ACP-ACA860-NZAA-KSFO)

2.2.7 REJ (REJECTION)

2.2.7.1 *Purpose*

Used to reject a clearance proposed by a CDN to a previously coordinated flight and terminate the coordination dialogue. The clearance remains as was previously agreed.

2.2.7.2 *Message Format*

ATS Field	Description
3	Message Type
7	Aircraft Identification
13	Departure Aerodrome
16	Destination Aerodrome

2.2.7.3 *Example*

(REJ-AAL780-KSFO-RJAA)

2.2.8 TRU (TRACK UPDATE)2.2.8.1 *Purpose*

Used to permit the coordination of amendments to previously agreed coordination conditions where prior coordination of these changes is not required. Because there is no operational response to the TRU message, use of this message must be in strict accordance with bilateral agreements between the ATSUs concerned.

2.2.8.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft Identification
13	Departure Aerodrome
16	Destination Aerodrome
Text	Track Data

2.2.8.3 Track data is a free text field used in the TRU message to permit the transfer of updated clearance information from one ATSU to another. This field contains a number of elements which are described below. Each element consists of an “identifier” and a value which are separated by a “/” character.

2.2.8.4 All of the elements within the Track data field are optional, and multiple elements may be included, separated by a single <space> character. Track data will contain at least one element. When multiple elements are to be transmitted in a single TRU message, the order of the elements within the Track data field is the order in which they are listed below. Unused elements are not included in the Track data field.

2.2.8.5 *Heading (HDG)*

This optional element is preceded by the identifier ‘HDG’ and contains the magnetic heading that has been assigned to the aircraft, expressed as a three digit number between 001 and 360.

Example

- (i) HDG/080

2.2.8.6 *Cleared Flight Level (CFL)*

This optional element is preceded by the identifier ‘CFL’ and contains the amended level that the aircraft has been assigned. Block levels in accordance with Part I paragraph 4.4.1.1 are also supported.

Examples

- (i) CFL/F330
(ii) CFL/F310F330

2.2.8.7 *Speed (SPD)*

This optional element is preceded by the identifier ‘SPD’ and contains details of the speed (Mach Number or Indicated airspeed) that the aircraft has been assigned.

- Mach numbers are expressed as “M” followed by 3 numerics giving the true Mach Number to the nearest .01 Mach.

- Indicated airspeeds are expressed as “I” followed by 4 numerics giving the Indicated Airspeed in knots.

2.2.8.7.1 To cancel an assigned speed that had been previously coordinated, the SPD identifier is followed by a “/” character, followed by zero (0)

Examples

- (i) SPD/M084
- (ii) SPD/I0250
- (iii) SPD/0

2.2.8.8 Direct to (DCT)

This optional element is preceded by the identifier ‘DCT’ and contains the position that the aircraft has been cleared directly to.

Examples

- (i) DCT/MICKY
- (ii) DCT/30S160E

2.2.8.9 Off Track deviation (OTD)

This optional element is preceded by the identifier ‘OTD’ and contains the details of any off track clearance that has been issued to the aircraft. The format of the off track deviation is as described in Part I paragraph 4.5, i.e.

- a single character providing advice as to whether the clearance is an offset (O) or a weather deviation (W); and
- an off track distance associated with this clearance;
- a direction, indicating left (L) or right (R) or, in the case of weather deviation, either side of track (E); and
- when including Offset information in an AIDC message, the direction “E” (either side of track) shall not be used

2.2.8.9.1 To cancel a previously coordinated off track deviation, the OTD identifier is followed by a “/” character, followed by zero (0).

Examples

- (i) OTD/W20R
- (ii) OTD/O30L
- (iii) OTD/0

2.2.8.10 Depending on automation, the receiving ATSU may automatically update their flight plan data, or simply display the message to the responsible controller.

2.2.8.11 *Examples*

- (i) (TRU-UAL73-NTAA-KLAX-CFL/F280 OTD/W20R)
- (ii) (TRU-QFA43-YSSY-NZAA-HDG/115 CFL/F270)

2.3 Transfer of control messages**2.3.1 TOC (TRANSFER OF CONTROL)****2.3.1.1 Purpose**

Used to offer the receiving centre executive control of a flight.

2.3.1.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

2.3.1.3 Example

(i) (TOC-TAP451/A2217-YMML-NZCH)

2.3.2 AOC (ASSUMPTION OF CONTROL)**2.3.2.1 Purpose**

Sent in response to a TOC to indicate acceptance of executive control of a flight.

2.3.2.2 Message Format

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome

2.3.2.3 Example

(i) (AOC-TAP451/A2217-NFFF-PHNL)

2.4 General information messages**2.4.1 EMG (EMERGENCY)****2.4.1.1 Purpose**

Used at the discretion of ATSUs when it is considered that the contents require immediate attention. Normally the information would be presented directly to the controller responsible for the flight or to the controller expecting to receive responsibility for the flight. When the message does not refer to a specific flight, a functional address shall be used and the information presented to the appropriate ATS position. Where such an address is used it is preceded by an oblique stroke (/) to differentiate it from an aircraft identification. The following are some examples of circumstances which could justify the use of an EMG message.

- a) Reports of emergency calls or emergency locator transmission reports.
- b) Messages concerning hi-jack or bomb warnings.
- c) Messages concerning serious illness or disturbance among passengers.
- d) Sudden alteration in flight profile due to technical or navigational failure.
- e) Communications failure

2.4.1.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification or functional address
18	Other information

2.4.1.3 *Examples*

- (i) (EMG-UAL123-RMK/Free Text)
- (ii) (EMG-/ASUP-RMK/Free Text)

2.4.2 MIS (MISCELLANEOUS)

2.4.2.1 *Purpose*

Used to transmit operational information which cannot be formatted to comply with any other message type and for plain language statements. Normally the information would be presented directly to the controller responsible for the flight or to the controller expecting to receive responsibility for the flight. When the message does not refer to a specific flight, a functional address shall be used and the information presented to the appropriate ATS position. Where such an address is used it is preceded by an oblique stroke (/) to differentiate it from an aircraft identification.

2.4.2.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification or functional address
18	Other information

2.4.2.3 *Examples*

- (i) (MIS-NWA456-RMK/Free Text)
- (ii) (MIS-/ASUP-RMK/Free Text)

2.4.3 TDM (TRACK DEFINITION MESSAGE)

2.4.3.1 *Purpose*

Used to distribute track information to affected Area Control Centres (ACCs) and Airline Operational Control Centres (AOCs) for flight planning. The message contains track definition and activity time periods.

2.4.3.2 *Message Format*

1. Message Identifier. The message begins with a "(TDM " and ends with ")". Fields within the message are separated by a space (i.e. " ").

2. Track Name. The track name consists of two fields. The first field is always TRK. The second field is the track identifier. The track identifier consists of 1 to 4 alphanumeric characters.

3. General Information. Contains:

(A) Date and time the track was generated and message number for that particular track in YYMMDDHHMMNN format where NN represents the message number. The initial TDM date/time message number group will look like: 941006134501. Message numbers 02 to 99 indicate TDM amendments or revisions. Note that zero padding may be required to provide the correct number of digits.

(B) Track status - Blank field for initial message or "AMDT" for amendment.

4. Activity Time Interval. This field consists of two date/time pairs, separated by a blank character, in the following format: YYMMDDHHMM YYMMDDHHMM

The first date/time pair represents the track activation, while the second is the track termination date/time.

Example: 9410070300 9410071500.

This example represents an activation date/time of October 7, 1994, at 0300 UTC and a termination date/time of October 7, 1994 at 1500 UTC.

5. Track Waypoints. This field contains the set of waypoints defining the track from the ingress fix to the egress fix. Waypoints are represented as latitude/longitude or named en route points. Waypoints are separated from each other by a blank space. Note that zero padding may be required. For example:

60N150W 60N160W, or NORML NUMMI, or FINGS 5405N13430W, etc.

6. Optional Fields

(A) Level: This optional field will not be used in the Pacific operations since levels are published in separate documents, eg. Pacific Ocean Supplements. However, the field will be retained for possible future use. If used in the future, track levels lists may be specified for the east and westbound directions of flight and a track levels list would contain the complete list of levels available on the track for the specified direction of flight. The levels would apply to all waypoints in the track waypoint list.

(B) Connecting routes (RTS): The RTS field is an optional field not normally used by automated ATS systems. When used, it is located after the waypoint list (before the remarks field) and begins with the keyword "RTS/" at the beginning of a line. Each line of the RTS field contains a single connecting route (to the ingress fix or from the egress fix).

7. Remarks. The Remarks subfield is a free text field that can contain additional comments. If there are no remarks a zero (0) is inserted as the only text. The remarks subfield begins with "RMK/".

2.4.3.3 *Examples*

2.4.3.3.1 The following TDM describes a route connecting Honolulu and Japan and would look similar to:

(TDM TRK A 940413124001
9404131900 9404140800
LILIA 27N170W 29N180E 31N170E 32N160E MASON
RTS/ PHNL KEOLA2 LILIA
MASON OTR15 SMOLT OTR16 SUNNS OTR20 LIBRA RJAA RMK/0)

2.4.3.3.2 The following TDM Revision describes a revision to the TDM shown in 2.4.3.3.1.

(TDM TRK A 940413131502 AMDT
9404131900 9404140800
LILIA 27N170W 29N180E 30N170E 32N160E MASON
RTS/ PHNL KEOLA2 LILIA
MASON OTR15 SMOLT OTR16 SUNNS OTR20 LIBRA RJAA RMK/0)

2.4.3.3.3 In the example given in 2.4.3.3.2 above, the message number (as delineated by the last two digits of the message generation date/time group) indicates it as the second ("2") message for the track. This is followed by "AMDT" to signify the previous message has been amended.

2.5 **Application Management Messages**

2.5.1 LAM (LOGICAL ACKNOWLEDGEMENT MESSAGE)

2.5.1.1 *Purpose*

Sent for each message (except for another LAM or LRM) that has been received, processed, found free of errors and, where relevant, is available for presentation to a control position. Non-receipt of an LAM may require local action. The message identifier and reference identifier are found in the message header, which is defined in Part II.

2.5.1.2 *Message Format*

ATS Field	Description
3	Message type

2.5.1.3 *Example*

(LAM)

2.5.2 LRM (LOGICAL REJECTION MESSAGE)

2.5.2.1 *Purpose*

Used to reject a message which contains invalid information. The message identifier and reference identifier are found in the message header, which is defined in Part II of this document. The LRM will identify the first field found that contains invalid information, if this field information is available.

2.5.2.2 *Message Format*

ATS Field	Description
.3	Message type
18	Other Information

2.5.2.3 Field 18 will only use the RMK/ sub-field. It will comprise an error code, supporting text and the field number in which the error occurred (where applicable).

2.5.2.4 The following format is used in the RMK/ sub-field of the LRM to report errors:

<error code>/<field number>/<invalid text>

2.5.2.5 The <error code> shall contain the appropriate error code number from Appendix B, Table B-1. The error code is described using up to three numeric characters without leading zeros. When multiple errors are detected in an AIDC message, only a single LRM should be generated in response. This LRM would usually contain the error code of the first error detected.

2.5.2.6 The <field number> will contain the field number corresponding to the error code extracted from Table B-1. Where multiple field numbers are assigned to an error code only the first field number containing the error will be sent. Where no field number is referenced in Table B-1 the field number sub-field will be empty. The field number can be described using up to six alphanumeric characters.

Note. Some ATSU's may not support non-numeric field numbers (e.g. "HEADER"). Whilst this is acceptable in order to preserve backwards compatibility with existing systems, the preferred implementation is for any non-numeric field numbers from Table B-1 to be supported within the LRM.

2.5.2.7 The <invalid text> field will contain the error text corresponding to the error code extracted from Table B-1 (not including any of 'explanatory text' that may have been included in Table B-1). If the specific error can be identified, it may optionally be appended to the Table B-1 error text. The invalid text field can contain up to 256 characters.

Note. Some ATSU's may not include the error text from Table B-1 in the <invalid text> field of transmitted LRMs. Whilst this is acceptable in order to preserve backwards compatibility with existing systems, the preferred option is for the LRM <invalid text> field to at least contain the error text from Table B-1.

2.5.2.8 The following shows a number of LRM examples. Where more than one LRM format is shown, the format of the first one is the preferred option.

2.5.2.9 *Examples*

(i) (LRM-RMK/1/HEADER/INVALID SENDING UNIT)

OR

(LRM-RMK/1/ /INVALID SENDING UNIT)

(See Note following paragraph 2.5.2.6)

(ii) (LRM-RMK/17/16/INVALID AERODROME DESIGNATOR)

OR

(LRM-RMK/17/16/)

(See Note following paragraph 2.5.2.7)

(iii) (LRM-RMK/57//INVALID MESSAGE LENGTH)

- (iv) (LRM-RMK/27/15/ INVALID LAT/LON 130S165E)
(The actual error “130S165E” may be optionally appended to the error text from Table B-1, see paragraph 2.5.2.7)

2.5.3 ASM (APPLICATION STATUS MONITOR)

2.5.3.1 *Purpose*

Sent to an adjacent centre to confirm that the adjacent centre’s ATC application system is online. It is transmitted when no other application messages have been received within an adaptable time.

The periodic interval between transmissions of this message should be determined based on the needs of the operational environment. Typical values may be between 5 and 30 minutes.

2.5.3.2 *Message Format*

ATS Field	Description
3	Message Type

2.5.3.3 *Example*

(ASM)

2.5.4 FAN (FANS APPLICATION MESSAGE)

2.5.4.1 *Purpose*

Transmitted by one ATSU (*generally* the controlling ATSU) to another ATSU (*generally* the receiving ATSU) to provide the required information necessary to establish CPDLC and/or ADS-C connections with a FANS equipped aircraft.

2.5.4.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
Text	Application data as described below

2.5.4.2.1 Receipt or transmission of a FAN message does not change the Coordination state of the flight.

2.5.4.3 *Application data field*

Application data is a free text field used in the FAN message to permit the transfer of FANS logon information from one ATSU to another. This field contains a number of elements which are described below. Each element consists of an “identifier” and a value which are separated by a “/” character. The abbreviation used for the identifier corresponds to the associated ICAO abbreviation (where one exists); otherwise the three character MTI (Message Type Identifier) contained in the logon is used (refer to ARINC 622 for a listing of various MTIs).

2.5.4.3.1 The order of the elements within the FAN message is the order that they are listed below, with consecutive elements being separated by a single <space> character. Although some elements within the Application data field may be “optional”, they should be included if the corresponding data is available (i.e. if the ATSU transmitting the FAN message has received this information either from a logon or a FAN message). This is for the benefit of downstream ATSUs that may use the information within these optional elements. If data is not available for an optional element, that element is not to be included in the FAN message.

2.5.4.3.2 Additional information concerning the elements described below is contained in Appendix D.

2.5.4.4 *Standard message identifier (SMI)*

This mandatory element is preceded by the identifier ‘SMI’, and contains information relating to the address to which uplink messages are routed to in the avionics. The value of the SMI sent in the FAN message is the downlink SMI as it was received in either the most recently received logon or FAN message.

- Allowable values for the SMI are listed in ARINC 620. Examples of SMIs include “FML”, “FMR”, “FMD”, “FM3” and “AFD”.

Example
SMI/FMD

2.5.4.5 *Aircraft identification*

This mandatory element is preceded by the identifier ‘FMH’, and contains the aircraft identification as it was received in either the most recently received logon or FAN message.

Example
FMH/MAS123

2.5.4.6 *Aircraft registration*

This mandatory element is preceded by the identifier ‘REG’, and contains the registration details of the aircraft – including the hyphen if applicable - as it was received in either the most recently received logon or FAN message.

Examples

- (i) REG/N12345
- (ii) REG/9V-ABC

2.5.4.7 *Aircraft Address (ICAO 24 bit code)*

This optional element is preceded by the identifier ‘CODE’, and contains the six character hexadecimal translation of the 24 bit aircraft address as it was received in either the most recently received logon or FAN message.

Example
CODE/ABC123

2.5.4.8 *Aircraft position information*

This optional element is preceded by the identifier ‘FPO’, and contains the position of the aircraft as determined by the ATSU at the time of transmission of the FAN message, if this information is

available. The position of the aircraft is expressed as a latitude/longitude in either dd[NS]ddd[EW] or ddmm[NS]ddmm[EW] format.

Examples

- (i) FPO/23S150E
- (ii) FPO/0823N11025E

2.5.4.9 *ATS Application and Version Number*

There will usually be multiple elements associated with the ATS Application and Version number (i.e. CPDLC and ADS-C). Occurrences of this element are preceded by the identifier 'FCO', which describes the ATS data link application(s) available in the avionics, as they were received in a logon or a previously received FAN message. The FAN message must include at least one ATS data link application - a separate identifier is used for each available application. These elements may be transmitted in any order.

2.5.4.9.1 The value associated with the FCO identifier consists of three letters to describe the application name immediately followed by (i.e. with no intervening spaces) two numeric characters to represent the associated version number. Possible values for the 3 letters are "ATC" (for CPDLC) or "ADS" (for ADS-C), and the possible range of version numbers is 01 to 99.

Examples

- (i) FCO/ATC01 FCO/ADS01
- (ii) FCO/ADS01

2.5.4.9.2 The second example illustrates a FAN message with the ADS-C application only. This may be either because the aircraft is not CPDLC equipped, or because the FAN is being used with an adjacent ATSU to enable monitoring using ADS-C by that ATSU when the aircraft is only entering the ACI.

2.5.4.10 *Examples*

- (i) (FAN-QFA43-YSSY-NZAA-SMI/AFD FMH/QFA43 REG/VH-OJA
FPO/34S158E FCO/ATC01 FCO/ADS01)
- (ii) (FAN-ANZ123-NZAA-KLAX-SMI/FML FMH/ANZ123 REG/ZK-NJP
FCO/ADS01)
- (iii) (FAN-SIA221-WSSS-YSSY-SMI/FMD FMH/SIA221 REG/9M-MRP
CODE/A254B3 FPO/1214S11223E FCO/ATC01 FCO/ADS01)

2.5.4.11 ATSUs should ensure that at least two of the ACID, REG, or CODE fields are used to ensure that the logon information contained in the FAN message is associated with the correct flight data record.

Note 1. If the FAN message contains information for the purpose of the next unit establishing a CPDLC connection, it should not be sent until after an appropriate CPDLC Next Data Authority message (NDA) has been transmitted to the aircraft, allowing a reasonable time for delivery of the NDA message.

Note 2. Where an aircraft enters an adjacent ATSU's ACI but does not actually enter the ATSU's airspace and a FAN message is sent to the adjacent ATSU to enable monitoring using ADS-C then the FCO identifier for the CPDLC application should not be included.

2.5.5 FCN (FANS COMPLETION NOTIFICATION)2.5.5.1 *Purpose*

The FCN may be transmitted by either the transferring or receiving ATSU to provide information concerning the CPDLC Connection status of the aircraft. It is transmitted by the transferring ATSU when their CPDLC Connection with the aircraft is terminated, providing notification to the receiving ATSU that they are the CPDLC Current Data Authority. It may also be transmitted by the receiving ATSU to provide notification of the establishment of a CPDLC Connection or the failure of a CPDLC Connection request.

2.5.5.1.1 Receipt or transmission of an FCN message does not change the Coordination state of the flight.

2.5.5.1.2 An FCN transmitted by the receiving ATSU may also (optionally) include contact/monitor frequency information to be issued to the aircraft by the transferring ATSU.

2.5.5.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft identification
13	Departure aerodrome
16	Destination aerodrome
Text	Communication Status as described below

2.5.5.3 *Communication Status field*

Communication Status is a free text field used in the FCN message to permit the transfer of CPDLC Connection status and (optionally) frequency information from one ATSU to another. This field may contain a number of elements which are described below. Each element consists of an “identifier” and a value which are separated by a “/” character. Separate elements are separated by a single <space> character.

2.5.5.4 *CPDLC Connection Status identifier (CPD)*

2.5.5.4.1 This mandatory element is preceded by the identifier “CPD”, and contains a single integer value which is used to provide information concerning an aircraft’s CPDLC Connection status. The value to be included in the CPDLC Connection Status field is determined from the following table.

CPDLC Connection Status		Meaning
FCN sent by transferring ATSU	FCN sent by receiving ATSU	
0		The CPDLC Connection with the aircraft has been terminated
	0	No CPDLC Connection could be established with the aircraft
	1	The CPDLC Connection Request failed due to the receiving ATSU not being the nominated CPDLC Next Data Authority
	2	A CPDLC Connection has been established with the aircraft

2.5.5.6 *Frequency identifier (FREQ)*

2.5.5.6.1 This optional element is preceded by the identifier “FREQ”, and may be included in an FCN message transmitted by the receiving ATSU to advise of any changes to a previously notified (or a default) frequency. The FREQ/ identifier provides advice to the transferring ATSU of the voice frequency to be transmitted to the aircraft in the CPDLC Contact/Monitor instruction. If no frequency information is to be transmitted this element should not be included in the FCN message.

2.5.5.6.3 When transmitted in the FCN message, the frequency variable does not contain units, spaces or leading zeroes. It may be up to 7 characters in length, containing integers or a decimal point selected from the frequency range below.

	Range	Units
HF	2850 to 28000	kHz
VHF	117.975 to 137.000	MHz
UHF	225.000 to 399.975	MHz

2.5.5.7 *Examples*

2.5.5.7.1 FCN transmitted by receiving ATSU:

- (i) (FCN-SIA221-YSSY-WSSS-CPD/0)
The CPDLC Connection request for SIA221 failed
- (ii) (FCN-ANZ15-KLAX-NZAA-CPD/2 FREQ/13261)
The CPDLC Connection request for ANZ15 was successful. Contact/Monitor voice frequency is 13261

2.5.5.7.2 FCN transmitted by transferring ATSU:

- (i) (FCN-QFA43-YSSY-NZAA-CPD/0)
The CPDLC Connection with QFA43 has been terminated

2.6 **Surveillance Data Transfer Service Messages**

2.6.1 ADS (SURVEILLANCE ADS-C)

2.6.1.1 *Purpose*

Used to transfer information contained in an ADS-C report from one ATSU to another.

2.6.1.2 *Message Format*

ATS Field	Description
3	Message type
7	Aircraft Identification
13	Departure Aerodrome
16	Destination Aerodrome
Text	ADS-C Data

2.6.1.3 *ADS-C data field*

ADS-C data is a free text field used in the ADS message to permit the transfer of information contained in an ADS-C report from one ATSU to another. The data field consists of an identifier (“ADS”) followed by a delimiter “/” character, followed by a text string containing specific text extracted from the encoded ACARS ADS-C report received from the aircraft.

2.6.1.3.1 The data field may also be used to indicate that no further ADS messages will be sent to the receiving ATSU for the flight. To indicate this state the ADS identifier is followed by a delimiter “/” character, followed by a “0” (zero). The trigger would be by bilateral agreement (e.g. an ADS-C report has been received that places the aircraft outside the ACI and the predicted route group indicates that the aircraft will not re-enter the ACI).

2.6.1.3.2 The specific text to be included in the AIDC ADS message is described in Appendix D – *Implementation Guidance Material*.

2.6.1.4 *Examples*

- (i) (ADS-ANZ90-RJAA-NZAA-ADS/.ZK-OKC030007FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC000E34D0EDC00010140F3E86)
- (ii) (ADS-ANZ90-RJAA-NZAA-ADS/0)

Table A-2. ASIA/PAC Core Messages

CORE	OPT	MESSAGE	MESSAGE ACRONYM	ICAO FIELDS											NON-ICAO FIELD
				3	7	8	9	10	13	14	15	16	18	22	
X		Advance Boundary Information	ABI	X	X				X	X		X		X 8, 9, 10, 15, 18, Text	
X		Current Flight Plan	CPL	X	X	X	X	X	X	X	X	X	X		
X		Coordination Estimate	EST	X	X				X	X		X			
X		Coordination Cancellation	MAC	X	X				X			X		X 14,18	
	X	PreActivation	PAC	X	X				X	X		X		X 8,9,10,15,18	
X		Coordination	CDN	X	X				X			X		X 10,14,15,18, Text	
X		Acceptance	ACP	X	X				X			X			
X		Rejection	REJ	X	X				X			X			
	X	Track Update	TRU	X	X				X			X			X
X		Transfer of Control	TOC	X	X				X			X			
X		Assumption of Control	AOC	X	X				X			X			

CORE	OPT	MESSAGE	MESSAGE ACRONYM	ICAO FIELDS											NON-ICAO FIELD
				3	7	8	9	10	13	14	15	16	18	22	
X		Emergency	EMG	X	X								X		
X		Miscellaneous	MIS	X	X								X		
	X	Track Definition Message	TDM	X											X
X		Logical Acknowledgment Message	LAM	X											
X		Logical Rejection Message	LRM	X									X		
	X	Application Status Monitor	ASM	X											
	X	FANS Application Message	FAN	X	X				X			X			X
	X	FANS Completion Notification	FCN	X	X				X			X			X
	X	Surveillance ADS-C	ADS	X	X				X			X			X

APPENDIX B - ERROR CODES**1. INTRODUCTION**

1.1 A set of error codes has been developed for those messages contained in the ASIA/PAC AIDC message set. A list of the codes, associated field number and error text is contained in the table below. This information is for the inclusion in any Logical Rejection Message transmitted in response to the reception of an AIDC message containing an error.

Table B-1. Error Codes

Error Code	Field Number	Error Text
1	HEADER	INVALID SENDING UNIT (e.g., AFTN Address)
2	HEADER	INVALID RECEIVING UNIT (e.g., AFTN Address)
3	HEADER	INVALID TIME STAMP
4	HEADER	INVALID MESSAGE ID
5	HEADER	INVALID REFERENCE ID
6	7	INVALID ACID
7	7	DUPLICATE ACID
8	7	UNKNOWN FUNCTIONAL ADDRESS
9	7	INVALID SSR MODE
10	7	INVALID SSR CODE
11	8	INVALID FLIGHT RULES
12	8	INVALID FLIGHT TYPE
13	9	INVALID AIRCRAFT MODEL
14	9	INVALID WAKE TURBULENCE CATEGORY
15	10	INVALID CNS EQUIPMENT DESIGNATOR
16	10	INVALID SSR EQUIPMENT DESIGNATOR
17	13, 16, 17	INVALID AERODROME DESIGNATOR
18	13	INVALID DEPARTURE AERODROME
19	16	INVALID DESTINATION AERODROME
20	17	INVALID ARRIVAL AERODROME
21	13, 16, 17	EXPECTED TIME DESIGNATOR NOT FOUND
22	13, 16, 17	TIME DESIGNATOR PRESENT WHEN NOT EXPECTED
23	13, 14, 16, 17	INVALID TIME DESIGNATOR
24	13, 14, 16, 17	MISSING TIME DESIGNATOR
25	14	INVALID BOUNDARY POINT DESIGNATOR
26	14, 15	INVALID ENROUTE POINT
27	14, 15	INVALID LAT/LON DESIGNATOR

Error Code	Field Number	Error Text
28	14, 15	INVALID NAVAID FIX
29	14, 15	INVALID LEVEL DESIGNATOR
30	14, 15	MISSING LEVEL DESIGNATOR
31	14	INVALID SUPPLEMENTARY CROSSING DATA
32	14	INVALID SUPPLEMENTARY CROSSING LEVEL
33	14	MISSING SUPPLEMENTARY CROSSING LEVEL
34	14	INVALID CROSSING CONDITION
35	14	MISSING CROSSING CONDITION
36	15	INVALID SPEED/LEVEL DESIGNATOR
37	15	MISSING SPEED/LEVEL DESIGNATOR
38	15	INVALID SPEED DESIGNATOR
39	15	MISSING SPEED DESIGNATOR
40	15	INVALID ROUTE ELEMENT DESIGNATOR
41	15	INVALID ATS ROUTE/SIGNIFICANT POINT DESIGNATOR
42	15	INVALID ATS ROUTE DESIGNATOR
43	15	INVALID SIGNIFICANT POINT DESIGNATOR
44	15	FLIGHT RULES INDICATOR DOES NOT FOLLOW SIGNIFICANT POINT
45	15	ADDITIONAL DATA FOLLOWS TRUNCATION INDICATOR
46	15	INCORRECT CRUISE CLIMB FORMAT
47	15	CONFLICTING DIRECTION
48	18	INVALID OTHER INFORMATION ELEMENT
49	19	INVALID SUPPLEMENTARY INFORMATION ELEMENT
50	22	INVALID AMENDMENT FIELD DATA
51		MISSING FIELD nn (See Note 2)
52		MORE THAN ONE FIELD MISSING
53		MESSAGE LOGICALLY TOO LONG
54		SYNTAX ERROR IN FIELD nn (See Note 2)
55		INVALID MESSAGE LENGTH
56		TDM ERROR
57		INVALID MESSAGE
58		MISSING PARENTHESIS
59		MESSAGE NOT APPLICABLE TO zzzz OAC
60	3	INVALID MESSAGE MNEMONIC (i.e., 3 LETTER IDENTIFIER)

Error Code	Field Number	Error Text
61	HEADER	INVALID CRC
62		UNDEFINED ERROR
63		MSG SEQUENCE ERROR: ABI IGNORED
64		MSG SEQUENCE ERROR: INITIAL COORDINATION NOT PERFORMED
65		MSG SEQUENCE ERROR: EXPECTING MSG xxx; RECEIVED MSG yyy (See Note 2)
66	14	INVALID BLOCK LEVEL
67	14	INVALID OFF-TRACK CLEARANCE TYPE
68	14	INVALID OFF-TRACK DIRECTION
69	14	INVALID OFF-TRACK DISTANCE
70	14	INVALID MACH NUMBER QUALIFIER
71	14	INVALID MACH NUMBER
72	ADF (See Note 3)	INVALID IDENTIFIER
73	ADF (See Note 3)	INVALID SMI
74	ADF (See Note 3)	INVALID ACID IN FMH/ IDENTIFIER
75	ADF (See Note 3)	INVALID REGISTRATION IN REG/ IDENTIFIER
76	ADF (See Note 3)	INVALID AIRCRAFT ADDRESS IN CODE/ IDENTIFIER
77	ADF (See Note 3)	INVALID LOCATION IN FPO/ IDENTIFIER
78	ADF (See Note 3)	INVALID DATA LINK APPLICATION IN FCO/ IDENTIFIER
79	ADF (See Note 3)	INVALID OR UNSUPPORTED CPDLC VERSION NUMBER
80	ADF (See Note 3)	INVALID OR UNSUPPORTED ADS-C VERSION NUMBER
81	ADF (See Note 3)	INVALID IDENTIFIER IN FAN MESSAGE
82	CSF (See Note 4)	INVALID CPDLC CONNECTION STATUS
83	CSF (See Note 4)	INVALID FREQUENCY IN FREQ/ IDENTIFIER
84	ADF (See Note 5)	INVALID IDENTIFIER IN ADS MESSAGE
85	ADF (See Note 5)	INVALID DATA IN ADS MESSAGE Note. This error message refers to the encoded ADS-C data (e.g. if it contains non-hexadecimal characters), rather than whether the contents of the decoded ADS-C report itself are valid.
86	TDF (See Note 6)	INVALID IDENTIFIER IN TRU MESSAGE
87	TDF (See Note 6)	INVALID HEADING IN HDG/ IDENTIFIER
88	TDF (See Note 6)	INVALID POSITION IN DCT/ IDENTIFIER
89	TDF (See Note 6)	INVALID OFF TRACK DEVIATION IN OTD/ IDENTIFIER
90	TDF (See Note 6)	INVALID FLIGHT LEVEL IN CFL/ IDENTIFIER
91	TDF (See Note 6)	INVALID SPEED IN SPD/ IDENTIFIER
92-256		RESERVED FOR FUTURE USE

Note 1. It is not intended that any amplifying text contained in parenthesis (i.e. “(e.g., AFTN Address)”) within the error text column be transmitted in any LRM.

Note 2. The intention is that in error codes 51, 54, 59 and 65 that lower case text (e.g. “nn”, or “xxx”) is replaced by the applicable value when this information is available.

Note 3. In the FAN message, the “ADF” field number refers to the Application data field

Note 4. In the FCN message, the “CSF” field number refers to the Communication Status field

Note 5. In the ADS message, the “ADF” field number refers to the ADS-C data field

Note 6. In the TRU message, the “TDF” field number refers to the Track data field

APPENDIX C - ATM APPLICATION NAMING CONVENTIONS

1. Eight character AFTN addresses will be used by the ASIA/PAC AIDC application to identify automated ATS end-systems. The first four characters identify the ATS unit location, while the last four characters identify an organization, end-system, or application process at the given location.

2. The table below describes a proposed naming convention, developed by the ATN Panel, for identifying ATM end-systems and applications. The last (eighth) character of the end-system's or application's AFTN address should be selected in accordance with the table.

8th character	ATM ground system application process
A	Air space management
B	Unassigned
C	Unassigned
D	Dynamic track generation
E	Unassigned
F	Flight data processing (processor routes to appropriate control sector based on internal configuration information.)
G	Reserved for State use
H	Reserved for State use
I	Reserved for State use
J	Reserved for State use
K	Reserved for State use
L	Reserved for State use
M	OPMET data bank
N	AIS data bank
O	Oceanic data processing
P	Unassigned
Q	Unassigned
R	Radar data processing (processor routes to appropriate control sector based on internal configuration information.)
S	System management
T	Air traffic flow management
U	Unassigned
V	Unassigned
W	Unassigned
X	Default value
Y	Service function
Z	Unassigned

APPENDIX D - IMPLEMENTATION GUIDANCE MATERIAL

1. INTRODUCTION

1.1 The AIDC Message set described in Appendix A of the ASIA/PAC Regional Interface Control Document (ICD) for ATS Interfacility Data Communications supports six ATS-related functions:

1. Notification;
2. Coordination;
3. Transfer of Control;
4. General (Text) Information Interchange;
5. Surveillance Data Transfer; and
6. Application Management.

1.2 This appendix contains Implementation Guidance Material (IGM) of an explanatory nature. Information on how the message set as a whole is intended to be used is provided, with particular emphasis on the first three functions. The objective is to provide useful information and guidance to software engineers responsible for implementing the ASIA/PAC AIDC Message set within an automated ATS system.

1.3 Although outside the scope of the ICD, Flight Planning messages play an important role within the region, and will continue to do so in the future.

2. PRELIMINARIES

2.1 Assumptions

2.1.1 The following assumptions have been made:

- a) The IGM applies only to those portions of a flight operating within the ASIA/PAC Regions;
- b) The material described below applies only to data transfers between two automated ATS systems. Though most of it also applies to the general case of Notification and Coordination between more than two automated ATS systems, certain multi-ATSU Coordination problems have not yet been solved;
- c) It must be possible to revert to manual intervention of the Notification, Coordination, and Transfer of Control processes at any time;
- d) Exceptional conditions, such as loss of communications between two ATSUs, are not addressed and are subject to local procedures; and
- e) An ATSU's Area of Common Interest (ACI) is defined as the airspace for which the ATSU is responsible, i.e., an FIR, and surrounding border regions just outside the FIR. These surrounding border regions are usually determined by the required separation minima.

2.2 AFTN Message Header

2.2.1 Every message transmitted shall contain an AFTN header, as specified in Part II of the ASIA/PAC ICD. This header shall contain the optional AFTN data fields described in Part II of the ASIA/PAC ICD.

2.2.2 Message identifier numbers (AFTN optional data field 2) shall be sequential. Receipt of an out of sequence message shall result in a warning being issued.

2.2.3 A check for duplicate message identifier numbers shall be made. In general, since 1,000,000 numbers are available, no duplicates should be present.

2.2.4 Message identifier numbers shall begin at 0, proceed through 999,999, and then rollover to 0. The same sequence shall be repeated when necessary.

2.2.5 Each unique ATSU-to-ATSU interface shall select message identifier numbers from its own pool of numbers. Each pool shall encompass the entire possible range, i.e., include all numbers from 0 to 999,999.

2.3 Response Messages

2.3.1 Application Response

2.3.1.1 Every ASIA/PAC AIDC message received by an ATSU, except a LAM or LRM, shall be responded to with a LAM or LRM. While no LAM is generated for a valid LRM, an ATSU may choose to respond to an invalid LRM with a LRM. Such a response is termed an Application Response, and is generated automatically by the automation system. A LAM shall be transmitted when the receiving automation system found the received message to be syntactically correct and the message data was accepted for further processing or presentation. Otherwise, a LRM message shall be transmitted.

2.3.1.2 The timeout value T_{alarm} associated with an application response shall be 180 seconds, corresponding to the nominal value associated with the accountability timer described in Part II, Section 2.2.2.

2.3.1.3 Failure to receive an expected application response (i.e. a LAM or LRM) within T_r seconds ($\leq T_{\text{alarm}}$) shall result in a re-transmission (up to a maximum number N_r) of the original message, using the same information contained in optional data fields 2 and 3 found in the original message header. The timeout timer T_r shall be reset upon re-transmission. Failure to receive an application response within T_{alarm} seconds from the original transmission of the message shall result in a warning being issued.

2.3.1.4 The transmission of a LAM or LRM shall be triggered by the ATC application process, not the communications process. This is because an application response indicates that the received message was examined by the ATC application process(s), not just the communications functions. Note the distinction between an ATC application process, which implements a critical ATC function such as Coordination or Transfer of Control, and a communications process, which is responsible for the reliable delivery of data, but not data interpretation. This approach conforms to the OSI Reference Model.

2.3.1.5 Receipt of an LRM shall cause the receiving ATSU to take a corrective action before re-transmitting the message. This action may be automatic, as in a CRC error being indicated, or manual, as in an incorrect route element format. Once this action has been taken, the message shall be re-transmitted with a new message identifier number.

2.3.2 Operational Response

2.3.2.1 Several ASIA/PAC AIDC messages require a response, in addition to the normal application response, by another AIDC message. Such a response is termed an Operational Response. Table D-1 below indicates the required response to a received message. ASIA/PAC AIDC messages not listed in Table D-1 have no operational response.

Table D-1. Required Operational Response

Received Message	Required Operational Response
CPL	ACP or CDN
EST	ACP
PAC	ACP
CDN	ACP, CDN, or REJ
TOC	AOC

Note. A REJ is not available in an Initial Coordination Dialogue initiated by a CPL, EST or PAC. A REJ is only available in a CDN dialogue.

2.3.2.2 Failure to receive a response within an adapted operational response timeout period T_{op} shall result in a warning being issued.

2.3.2.3 The value of T_{op} is dependent on whether manual processing is required to generate the operational response. In general, T_{op} should be less than 600 seconds when a manual action is required to trigger the operational response.

2.3.2.4 An operational response shall employ the AFTN header optional data field 3 to reference the original message being responded to. A coordination dialogue, which is initiated by one message and contains a sequence of message exchanges, until terminated by an ACP or REJ shall always reference the original message which triggered the dialogue. For example, one ATSU may initiate a coordination dialogue by transmitting a CPL message to an adjacent ATSU. A sequence of CDN messages may ensue, terminated by an ACP message. The CDN and ACP messages would all reference the original CPL message. After completion of the initial coordination dialogue in the preceding example one ATSU may initiate another coordination dialogue by transmitting a CDN message. A sequence of CDN messages may ensue, terminated by an ACP message. Messages in this new coordination dialogue would reference the first CDN message in the dialogue.

2.4 Application Management

2.4.1 The ASM message is used to confirm that the ATC application on the other end is on-line. This message is sent by ATSU A to (adjacent) ATSU B if, after a mutually agreed time, no communication has been received from ATSU B. ATSU B responds, if the ATC application is active and functioning, by sending a LAM to ATSU A. If ATSU A does not receive a response LAM from ATSU B within a specified time, local contingency procedures should be executed. This message would normally be sent automatically, but may be sent manually for testing purposes.

2.4.2 The FAN message may be used to transfer a data link aircraft's logon information from one ATSU to another. Implementation of this message removes the need to utilise the five step "Address Forwarding" process (initiated by the FN_CAD) that was developed for the initial implementation of FANS. The message contains all the information that is required to establish ADS-C and/or CPDLC connections with the aircraft. In the event that only an ADS-C connection will be required, the transferring ATSU should include ADS-C information only. If a FAN message is transmitted containing ADS-C information only, there should be no expectation of receiving an FCN (see below) response. If a FAN message is received containing ADS-C Application information only, there should be no attempt to establish a CPDLC connection.

2.4.3 Normally, one FAN message would be sent for each data link transfer per flight. However, when a FCN is received with a communication status field value of (1) indicating the receiving ATSU is not the Next Data Authority, the transferring ATSU should send another NDA message to the aircraft and another FAN message to the receiving ATSU to indicate that the NDA has been sent (refer Figure D-4). While the second FAN may not be required for address forwarding

purposes it does provide the receiving ATSU with a positive indication that another NDA has been sent to the aircraft.

2.4.4 ATSUs implementing the FAN message should consider retaining existing Address Forwarding functionality to be used as a contingency for data link transfers in the event of failure of the ground-ground link.

2.4.5 Similarly to Address Forwarding, the FAN message should be sent at a time parameter prior to the boundary with the next ATSU. This parameter should be in accordance with guidance outlined in the FANS Operations Manual (FOM). Functionality for the transmission of a FAN message manually by the ATS officer should also be implemented.

2.4.6 Information concerning the identity of the aircraft (i.e. aircraft identification, aircraft address and registration) contained in the Application data field must not be extracted from the flight plan – it must be information that was contained in either the most recently received logon or FAN message.

Note. This requirement only applies to the aircraft identification within the Application data field of the FAN message. The aircraft identification (i.e. ATS Field 7) at the beginning of the FAN message is the identification of the aircraft from the ATS flight plan.

2.4.6.1 When extracting the identity of the aircraft from the logon, the information required is the aircraft identification within the CRC protected portion of the logon – not the flight identifier (FI) that is contained in Line 4 of the ACARS logon message. In the example below, the aircraft identification is **QFA924**, rather than the QF0924 contained in Line 4 of the ACARS message.

```
QU BNECAYA
.QXSXMXS 010019
AFD
FI QF0924/AN VH-EBA
DT QXT POR1 010019 J59A
- AFN/FMHQFA924.,VH-
EBA,,001902/FPOS33373E150484,0/FCOADS,01/FCOATC,01292B
```

2.4.7 Under certain circumstances (e.g. FMC failure) it is possible for the SMI of an aircraft to change in flight, which will require a new logon from the aircraft to permit data link services to continue. To ensure that the next ATSU has up to date information, the SMI transmitted in any FAN message should be the SMI from the most recently received logon or FAN message.

2.4.8 A hyphen within the registration that was contained in either the logon or any previously received FAN message must also be included in the REG element of any transmitted FAN message. Without this hyphen, data link messages transmitted by the ATSU may not be delivered to the aircraft.

Note. ATSUs implementing the FAN message must be aware of the possible existence of this hyphen within the registration, and that it does not signify a “new field” as is the case with other AIDC messages.

2.4.8.1 Any “padding” in the registration contained in the logon (e.g. preceding periods < . >s) must not be included in the FAN message. In the sample ACARS message above, the registration to be included in the FAN message would be “VH-EBA”, not “.VH-EBA”.

2.4.9 Some ATSUs may utilise the aircraft position which is an optional field that may be contained in the logon. If the aircraft position information element is to be included in any transmitted FAN message, there is little purpose in simply relaying the aircraft position from the original logon – the calculated position of the aircraft should be used instead.

2.4.10 The FCN message, where used, provides advice to the transferring ATSU that the receiving ATSU has established an (inactive) CPDLC connection with an aircraft. The transmission of an FCN message is triggered by an event such as the termination of a CPDLC Connection by the transferring ATSU, or the establishment of (or failure to establish) a CPDLC Connection by the receiving ATSU. FCN messages should only be transmitted when a CPDLC transfer is being effected – i.e. not for transfers involving aircraft that are only ADS-C equipped.

2.4.11 *Multiple FCN messages*

2.4.11.1 The general philosophy for use of the FCN is that only a single FCN message is transmitted by each ATSU for each flight. Under normal conditions, changes in CPDLC status after transmission of an FCN should not result in the transmission of another FCN (an exception to this is when a Connection request fails due to the receiving unit not being the nominated next data authority – see Table below).

Table D-2. FCN Transmission

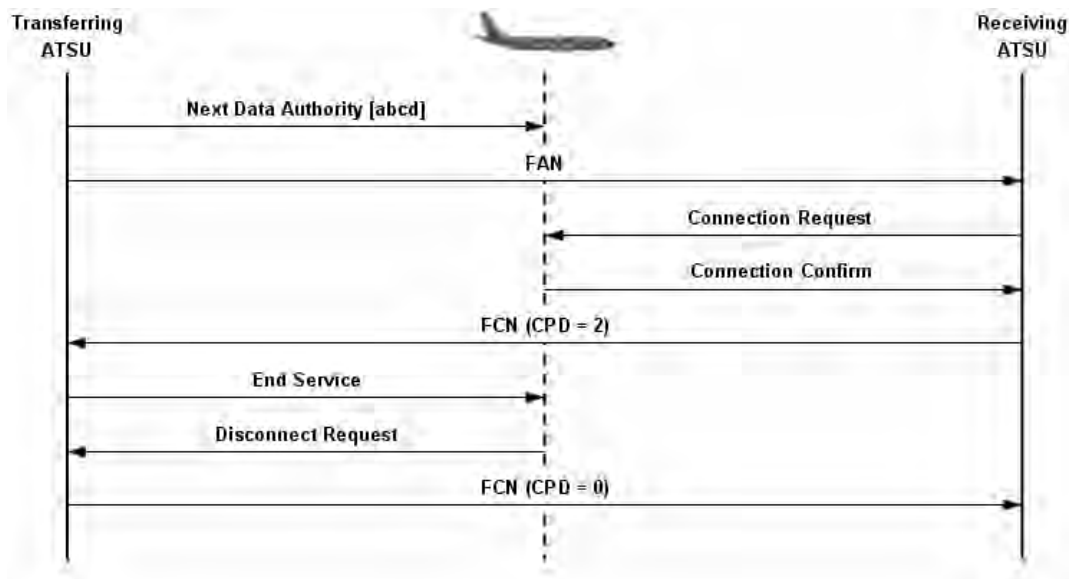
ATSU transmitting FCN	When an FCN should be sent
Transferring ATSU	On receipt of a Disconnect Request terminating the CPDLC Connection
Receiving ATSU	On receipt of a Connection Confirm, establishing a CPDLC Connection
Receiving ATSU	On receipt of CPDLC downlink #64 [<i>icaofacilitydesignation</i>], Note. This provides advice to the transferring ATSU to uplink an appropriate Next Data Authority message to the aircraft. And subsequently: On establishment of a CPDLC Connection
Receiving ATSU	Following initial failure of a CPDLC Connection request or a time parameter prior to the FIR boundary, if no CPDLC Connection has yet been established, whichever occurs later

2.4.11.2 Procedures following a change to CPDLC Connectivity following the transmission of an FCN message should be described in local procedures (e.g. voice coordination), rather than by transmission of another FCN message.

2.4.12 Procedures for the notification of changes to the voice frequency after the transmission of an FCN message should be described in local procedures rather than via the transmission of another FCN message.

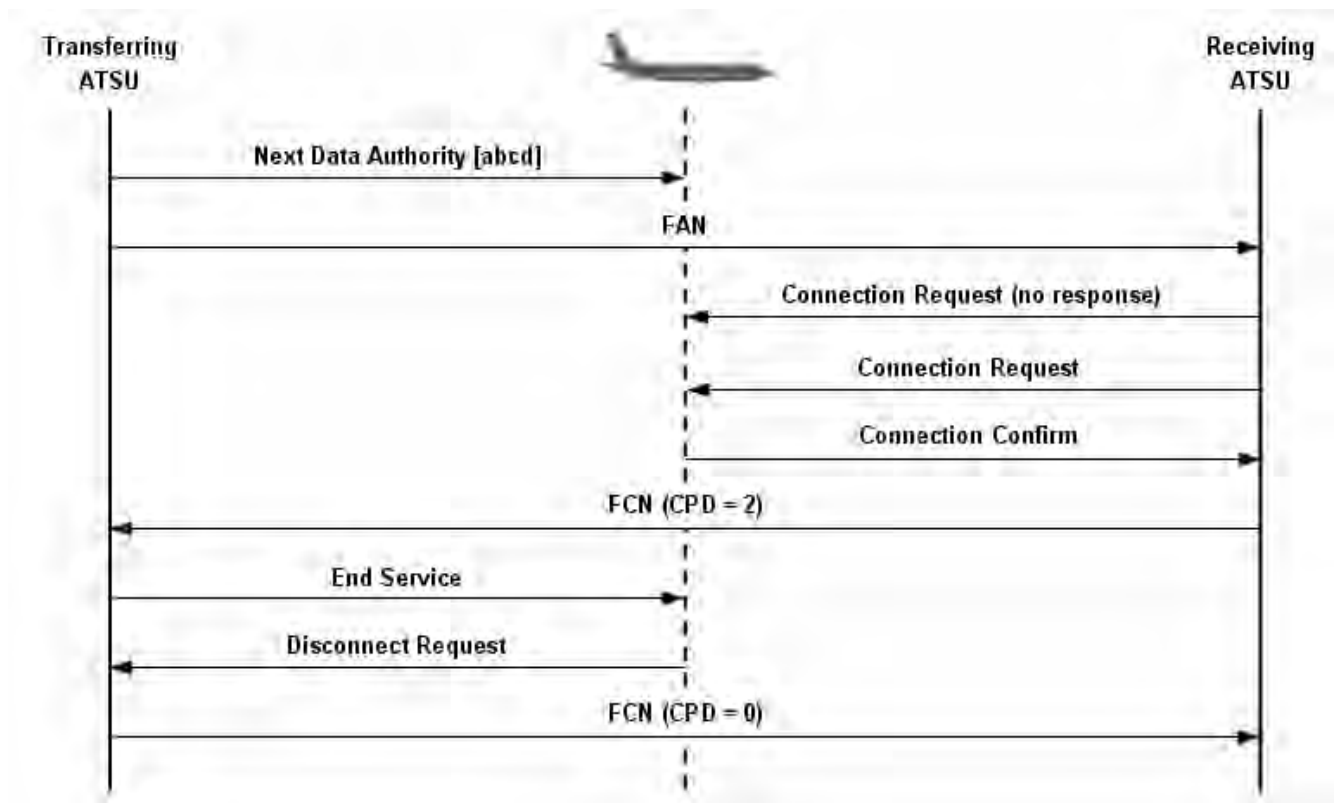
2.4.13 **Sample flight threads involving FAN and FCN messages**

2.4.13.1 The following diagrams show typical flight threads involving the FAN and FCN messages. Relevant uplink and downlink messages between the aircraft and the ATSU are also shown.

Figure D-1. Routine data link Transfer using FAN and FCN messaging

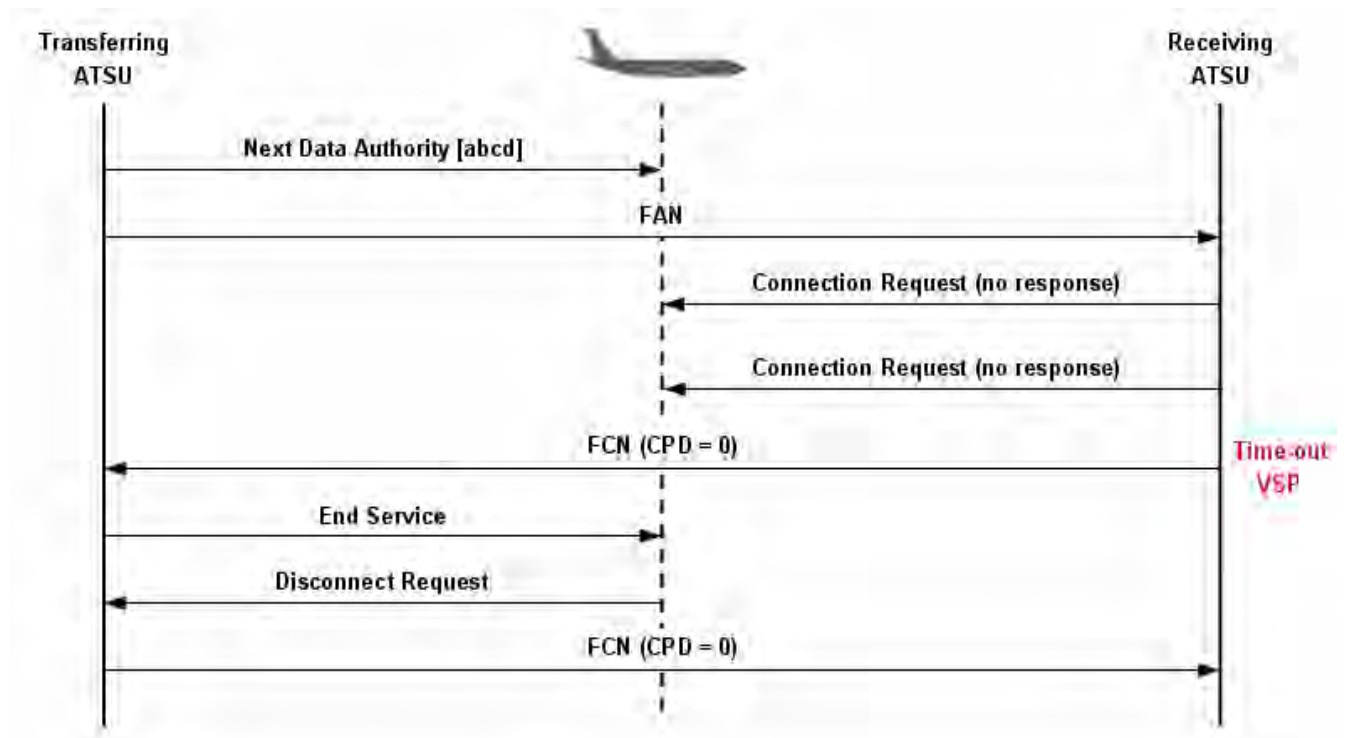
2.4.13.2 Figure D-1 shows a routine data link transfer from one ATSU to the next. The first step in the transfer process is the uplinking of a CPDLC Next Data Authority message to the aircraft advising the avionics of the next centre that will be communicating with the aircraft via CPDLC. A FAN message is then sent to the next ATSU to provide them with the aircraft's logon information. The receiving ATSU then successfully establishes a CPDLC connection with the aircraft and transmits a 'successful' FCN (CPD = 2) back to the transferring ATSU. On termination of the CPDLC Connection, the transferring ATSU transmits an FCN (CPD=0) to the receiving ATSU.

Figure D-2. CPDLC Transfer using FAN and FCN messaging – initial Connection Request failed

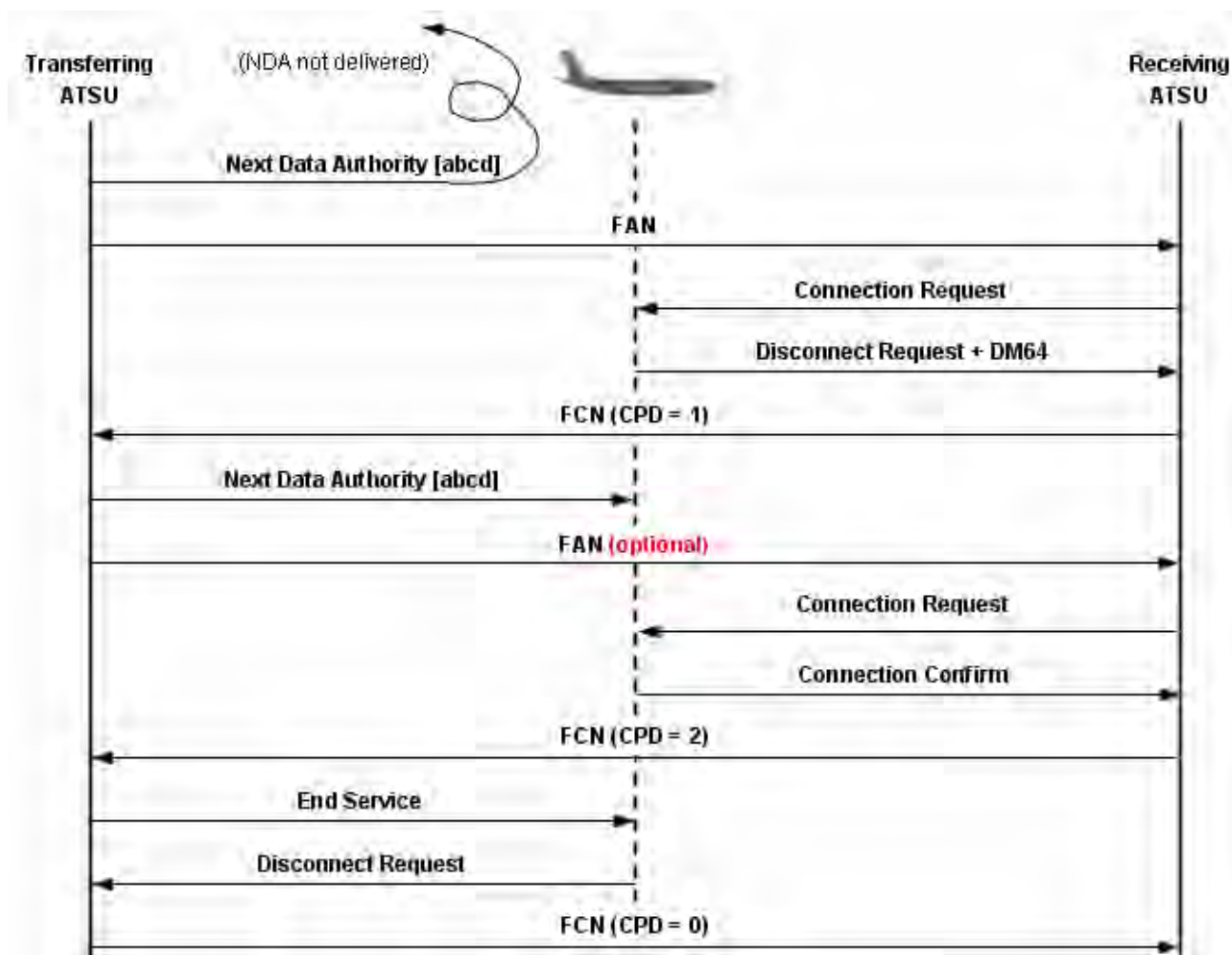


2.4.13.3 Figure D-2 shows a data link transfer where there is no response by the avionics to the initial Connection Request uplinked by the receiving ATSU. A subsequent Connection Request is uplinked to the aircraft which is successful. Because the CPDLC Connection is finally established prior to the 'time out' VSP before the FIR boundary, a successful FCN (CPD=2) is transmitted to the transferring ATSU. On termination of the CPDLC Connection, the transferring ATSU transmits an FCN (CPD=0) to the receiving ATSU.

Figure D-3. CPDLC Transfer using FAN and FCN messaging – Unable to establish CPDLC Connection



2.4.13.4 Figure D-3 shows an attempted data link transfer where there is no response by the avionics to multiple CPDLC Connection requests uplinked by the receiving ATSU before the 'time out' VSP prior to the FIR boundary. An unsuccessful FCN (CPD=0) is transmitted to the transferring ATSU. Letters of Agreement should describe the procedures to be followed in the event that the receiving ATSU establishes a CPDLC Connection after this FCN has been transmitted. Even though the receiving ATSU has advised of their inability to establish a CPDLC connection, the transferring ATSU still transmits an FCN (CPD=0) when their CPDLC Connection with the aircraft is terminated.

Figure D-4. CPDLC Transfer using FAN and FCN messaging – initial NDA not delivered

2.4.13.5 Figure D-4 shows a data link transfer in which the original Next Data Authority message uplinked by the transferring ATSU is not delivered to the aircraft. An FCN (CPD=1) is transmitted by the receiving ATSU advising of the failure of their CPDLC Connection request. Another Next Data Authority message is uplinked to the aircraft. The transferring ATSU may send another FAN message after which the receiving ATSU successfully establishes a CPDLC Connection. Because this occurs before the time out VSP prior to the FIR boundary, a successful FCN (CPD=2) is transmitted back to the transferring ATSU. On termination of the CPDLC Connection, the transferring ATSU transmits an FCN (CPD=0) to the receiving ATSU.

3. PHASES OF FLIGHT

3.0.1 From an ATSU's perspective, a flight is considered to progress through several phases. The IGM is principally concerned with three phases: Notification, Coordination, and Transfer of Control.

3.1 Notification Phase

3.1.1 An ATSU receives information during the Notification phase on a flight which will at some future time enter its ACI.

3.1.2 **Notification Dialogue.** ABI messages shall be used to transfer notification information. The sending ATSU transmits an ABI to the downstream ATSUs (D-ATSUs) (including the next Receiving ATSU - the R-ATSU) with which it must coordinate the flight. The sending ATSU is responsible for determining which D-ATSUs must be notified.

3.1.3 **Re-Route Notification.** All D-ATSUs to the destination aerodrome shall be notified when a re-route has been made. Re-route dissemination shall be performed as a minimum capability on a stepwise (i.e., from one D-ATSU to the next D-ATSU) basis. In stepwise dissemination, an ATSU receiving an ABI is responsible for passing it on to any other affected D-ATSUs at the appropriate time.

3.1.4 **Route to Destination.** The above procedure requires the C-ATSU to acquire the complete route to destination. Initially, this information is found in the route field of the Filed Flight Plan (FPL). As re-routes occur, the filed route must be updated by the C-ATSU, and transmitted to D-ATSUs. In cases where this is not possible, the route field shall be terminated after the last known significant point with the ICAO truncation indicator, which is the letter “T”.

Note: In accordance with PANS-ATM Doc 4444 the truncation indicator shall only follow a significant point or significant point/Cruising Speed and Cruising level in Field 15 and shall not follow an ATS route designator.

3.1.5 **Re-route to new destination.** The procedures described below apply when the notification and coordination of amended destinations has been included in bilateral agreements.

3.1.5.1 If an amendment to the destination aerodrome occurs **prior to** the transmission of the first ABI to an adjacent ATSU:

- Field 16 shall contain the original destination of the aircraft;
- The Amended destination field shall contain the new destination of the aircraft.

3.1.5.2 Subsequent AIDC messages shall contain the new destination in Field 16, without reference to an amended destination.

3.1.5.3 If an amendment to the destination aerodrome occurs **after** the transmission of the first ABI to an adjacent ATSU, but before coordination has occurred, a new ABI shall be transmitted:

- Field 16 shall contain the original destination of the aircraft;
- The Amended destination field shall contain the new destination of the aircraft.

3.1.5.4 Subsequent AIDC messages shall contain the new destination in Field 16, without reference to an amended destination.

3.1.5.5 The format of the Amended destination field shall be one of the options described below:

- ICAO four-letter location indicator; or
- Name of the destination aerodrome, for aerodromes listed in Aeronautical Information Publications; or
- Latitude/longitude in the format dd[NS]ddd[EW] or ddmm[NS]dddmm[EW]; or
- Bearing and distance from a significant point, using the following format:
 - the identification of the significant point, followed by
 - the bearing from the significant point in the form of 3 figures giving degrees magnetic, followed by
 - the distance from the significant point in the form of 3 figures expressing nautical miles.

3.16 **Notification Cancellation.** A notification can be cancelled using a MAC message. Receipt of a MAC by an ATSU means that any notification data previously received for that flight is no longer relevant. Filed flight plan information (and any modifications) shall continue to be held, in accordance with local ATSU procedures.

3.2 Coordination Phase

3.2.1 Coordination between adjacent ATSUs occurs when the flight approaches a shared FIR boundary. An initial coordination dialogue can be automatically initiated a parameter time or distance from the boundary, as documented within a bi-lateral agreement, or it can also be manually initiated. There are several types of coordination dialogues which may occur, depending on where the aircraft is and what previous dialogues have occurred.

3.2.2 **Initial Coordination Dialogue.** This coordination dialogue (or an Abbreviated Initial Coordination dialogue) is always required to be successfully completed before later coordination dialogues are initiated. The C-ATSU transmits a CPL to the R-ATSU. The R-ATSU then responds with either an ACP, which signifies acceptance of the coordination conditions contained within the CPL, or a CDN which proposes a modification to the conditions contained in the CPL. If a CDN is the R-ATSU's response to the CPL, a sequence of CDNs may be exchanged between the two ATSUs. This dialogue is eventually terminated by the ATSU which last received a CDN transmitting an ACP to the other ATSU. Transmission of an ACP indicates that coordination conditions are mutually acceptable, and an initial coordination has been achieved.

3.2.3 **Abbreviated Initial Coordination Dialogue.** An Abbreviated Initial Coordination dialogue may be used in place of an Initial Coordination Dialogue when it is known *a priori* (e.g., by letters of agreement) that a flight's coordination data is mutually acceptable to both the C-ATSU and R-ATSU, accurate route information is available at the R-ATSU (e.g., from either an ABI or FPL message), and both ATSUs have agreed to permit the use of this dialogue. The C-ATSU transmits an EST or PAC to the R-ATSU. The R-ATSU then responds with an ACP, which signifies acceptance of the coordination conditions (i.e., boundary crossing data) contained within the EST or PAC. Either this dialogue or a full (i.e., CPL-based) Initial Coordination dialogue shall be successfully completed before any later coordination dialogues are initiated. Note that negotiation via CDNs is not permitted within this dialogue.

3.2.3.1 PAC is only used when coordination is required before departure. This normally only occurs when the FIR boundary is close to the departure airport. PAC signals to the R-ATSU that the departure is imminent as well as initiating coordination.

3.2.4 **Re-Negotiation Dialogue.** This is an optional dialogue used to propose new coordination conditions after the initial dialogue has been completed. Either ATSU may initiate this dialogue by transmitting a CDN (in contrast to a CPL in the Initial Coordination Dialogue) to the other ATSU. The dialogue then proceeds with an exchange of additional CDNs as necessary. Either ATSU may terminate the dialogue in one of two ways: (1) with an ACP, indicating that the coordination proposal contained in the latest CDN is acceptable; or (2) with an REJ, indicating that the previously agreed upon coordination conditions remain in effect.

3.2.5 **Active CDN.** For a given flight, only one CDN may be active between any pair of ATSUs. Note, however, that coordination between more than two ATSUs (for the same flight) may have a total number of active CDNs greater than one, though each pair of ATSUs is still restricted to a maximum of one active CDN per flight. In the exceptional (rare) case where a C-ATSU and D-ATSU both simultaneously transmit CDNs, the C-ATSU shall transmit an REJ to the D-ATSU, cancelling the D-ATSU's CDN.

3.2.6 **CDNs Are Proposals.** Note that CDNs are only proposals; no changes are made in a flight's profile until an ACP is sent and acknowledged.

3.2.6.1 To ensure interoperability between ATSUs, when using a CDN to propose a diversion to an alternative destination, the following procedures shall be used:

3.2.6.2 The mandatory Field 16 shall contain the original (i.e. the "current") destination aerodrome. The Amended Destination text field shall contain the amended destination.

3.2.6.3 The format of the Amended destination field shall be one of the options described below:

- ICAO four-letter location indicator; or
- Name of the destination aerodrome, for aerodromes listed in Aeronautical Information Publications; or
- Latitude/longitude in the format dd[NS]ddd[EW] or ddmm[NS]dddmm[EW]; or
- Bearing and distance from a significant point, using the following format:
 - the identification of the significant point, followed by
 - the bearing from the significant point in the form of 3 figures giving degrees magnetic, followed by
 - the distance from the significant point in the form of 3 figures expressing nautical miles.

3.2.6.4 The mandatory Field 16 contained in the operational response (ACP, REJ, CDN) to a CDN that proposes an amended destination shall contain the original (i.e. the “current”) destination aerodrome.

Note: Due to the complexities involved with maintaining multiple profiles for “current destination” vs. “amended destination” ATSUs should consider prohibiting (via bilateral agreement) an operational response of CDN in any coordination renegotiation dialogues that contain an amended destination.

3.2.6.5 Provided that the proposed amendment is agreed to, all subsequent AIDC messages concerning this aircraft shall contain the new destination in the mandatory Field 16.

3.2.7 **Cleared Flight Profile Update.** The cleared flight profile (which is used for control purposes) shall only be updated after successful completion of a coordination dialogue, i.e., an ACP has been sent and acknowledged. This will require temporarily storing a proposed flight profile undergoing coordination separate from the cleared flight profile. The cleared flight profile shall then be updated using the newly coordinated profile upon successful completion of the coordination dialogue.

3.2.8 **Automatic update of coordination conditions.** When included in bilateral agreements between ATSUs, changes to previously agreed coordination conditions may be coordinated by way of a TRU message. The intent of this message is to allow amendments to certain elements of an aircraft’s clearance to be coordinated to an adjacent ATSU. In contrast to the CDN, there is no operational response to a TRU message – this message is used when there is agreement to what amendments can be made to an aircraft’s clearance by the controlling ATSU after initial coordination has occurred without prior coordination.

3.2.8.1 Whilst a number of the elements that may be coordinated by a TRU message may be more suited to an environment associated with an ATS Surveillance system (e.g. Heading, Direct to, etc), other elements may be applicable in *any* ATS environment (e.g. Cleared Flight Level, Off track deviation, Speed, etc).

3.2.8.2 The TRU message makes use of the Track data field to provide updated clearance information to an adjacent ATSU. Track data may be used to update assigned heading, assigned level, off track clearances, assigned speed or ‘direct to’ information.

3.2.8.3 When using the DCT/[position] element in the TRU message, [position] would normally be located on the flight planned route of the aircraft. Local procedures should specify the actions to be taken in the event that [position] is not on the flight planned route.

3.2.8.4 For the purpose of the TRU message, the format of [position] is one of the following:

- From 2 to 5 characters, being the coded designator assigned to an en-route point or aerodrome; or
- ddm[NS]dddmm[EW]; or
- dd [NS]ddd[EW]; or
- 2 or 3 characters being the coded identification of a navigation aid, followed by 3 decimal numerics giving the bearing from the point in degrees magnetic followed by 3 decimal numerics giving the distance from the point in nautical miles.

3.2.9 **Coordination Cancellation.** Coordination can be cancelled using a MAC message. Receipt of a MAC by an ATSU means that any coordination (or notification) data previously received for that flight is no longer relevant. Filed flight plan information (and any modifications) shall continue to be held, in accordance with local ATSU procedures.

3.2.10 **Coordination and the ACI.** ATSU A may need to coordinate with or provide information to ATSU B on all aircraft that enter ACI B, even if they do not enter FIR B. Consider the case of aircraft A in FIR A and aircraft B in FIR B, both flying near the FIR A - FIR B boundary but never penetrating the other FIR's airspace. The maintenance of adequate separation between these two aircraft may require coordination between or the provision of information to adjoining ATSUs.

3.3 **Transfer of Control Phase**

3.3.1 **Transfer Dialogue.** This phase occurs when the C-ATSU is ready to relinquish control of the flight to the R-ATSU, normally just before the FIR boundary crossing. The C-ATSU transfers a TOC message to the R-ATSU, which responds with an AOC message. The R-ATSU then becomes the C-ATSU once an application response for the AOC has been received.

3.3.2 **Transfer of Control and the ACI.** Note that the Transfer of Control process will not occur for all flights. Some flights fly near an FIR boundary, and may require coordination or the provision of other information, but do not actually enter the FIR.

4. **FLIGHT STATE TRANSITIONS**

4.1 **Notifying States.** Consider an aircraft that is currently within an ASIA/PAC FIR - FIR A - controlled by ATSU A (i.e. the C-ATSU) progressing towards the next FIR, FIR B (i.e. the R-ATSU). The aircraft is several hours from the boundary between the two FIRs. The flight is initially in a Pre-Notifying state from ATSU B's perspective. ATSU B usually will have previously received a Filed Flight Plan (an FPL message), possibly with later amendments (as contained in CHG messages). ATSU A will employ a Notification dialogue to transfer information to ATSU B. (This transfer occurs at either a system parameter time (e.g. 60 minutes) or distance prior to the flight crossing the FIR A - FIR B boundary.) This places the flight in a Notifying state from ATSU B's perspective. Additional Notification dialogues may be invoked by ATSU A as needed to inform ATSU B of flight changes. If the aircraft for some reason, for example a change in route, is no longer expected to penetrate ACI B, ATSU A sends a MAC message to ATSU B, causing the flight to be placed back in a Pre-Notifying state from ATSU B's perspective.

4.2 **Initial Coordination States.** An Initial Coordination Dialogue is employed to effect the initial coordination. ATSU A transmits a CPL to ATSU B when the aircraft is at a mutually agreed upon predetermined time (e.g. thirty minutes) or distance from the FIR A - FIR B boundary. The flight is now in a Negotiating state from both ATSU A's and ATSU B's perspectives. ATSU B can accept the conditions specified in the CPL "as is" by transmitting an ACP message to ATSU A, or it can propose modifications using the CDN message. Negotiations between the two ATSUs are carried out using the CDN until a mutually acceptable flight profile is achieved. This acceptance is signalled by one ATSU sending an ACP, as before, to the other ATSU. This establishes the initial coordination conditions. From the perspective of both ATSUs the flight is now in a Coordinated state.

4.2.1 For an Abbreviated Initial Coordination, ATSU A transmits an EST to ATSU B when the aircraft is at a mutually agreed upon predetermined time (e.g. thirty minutes) or distance from FIR A - FIR B boundary. The flight is now in a Coordinating state. ATSU B responds with an ACP, which places the flight in a Coordinated state. This sequence of messages corresponds to an Abbreviated Initial Coordination Dialogue.

4.3 **Re-Negotiation States.** The initial coordination is typically the final coordination. However, in certain situations, it may be desirable, or necessary, to re-open the coordination dialogue after initial coordination has been completed. A Re-Negotiation dialogue is employed to effect profile changes. The dialogue is re-opened when one ATSU (either A or B) transmits a CDN to the other ATSU, causing the flight to be in a Re-Negotiating state. The dialogue proceeds as above using CDN messages until either an ACP or REJ is sent. Either ATSU can close the dialogue by issuing an ACP or REJ. An ACP closes the dialogue with a new, mutually agreed upon flight profile. An REJ, however, immediately terminates the dialogue with the previously accepted coordination conditions remaining in effect. Any proposed changes are null and void. Transmission of an ACP or REJ places the flight back into the Coordinated state.

4.4 **Transfer States.** Transfer of control is supported by the Transfer dialogue. ATSU A sends a TOC to ATSU B when the aircraft is about to cross the boundary. Alternatively, ATSU A can send a TOC when it is ready to relinquish control, even if the aircraft will remain in FIR A airspace several minutes before entering FIR B. The flight is now in a Transferring state from both ATSU A's and ATSU B's perspectives. ATSU B responds by transmitting an AOC to ATSU A, signalling acceptance of control responsibility. The flight is now in a Transferred state from ATSU A's perspective.

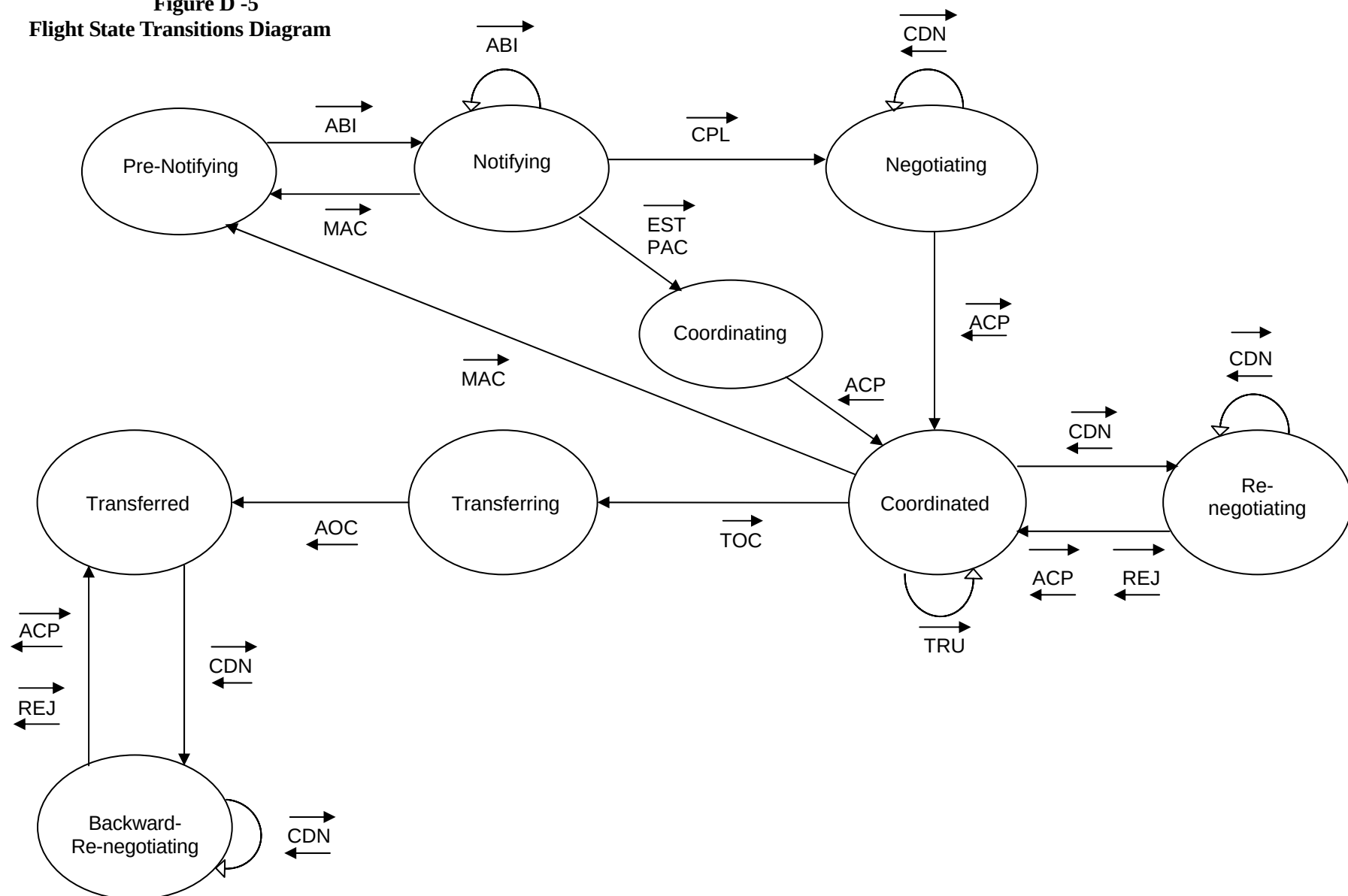
4.5 **Backward Re-Negotiating State.** A flight's profile may occasionally require changes after Transfer of Control has been completed, but the aircraft is still within ATSU A's ACI. A Re-Negotiating dialogue is employed to effect profile changes after transfer has been completed. This places the flight in a Backward Re-Negotiating State, from both ATSUs' perspectives. Completion of this dialogue returns the aircraft to the Transferred state.

4.6 Several flight states are identified in the above discussion. These states are listed in Table D-3 below.

Table D-3 Flight States

Flight State	Description
Pre-Notifying	Flight plan information may have been received. Any previously received notification and coordination information for the given flight cancelled by a MAC is no longer relevant.
Notifying	The aircraft's progress is being monitored by one or more non-controlling ATSUs, in addition to the controlling ATSU.
Negotiating	Coordination data is being exchange between the controlling ATSU and the receiving ATSU as part of the initial coordination dialogue.
Coordinating	Abbreviated coordination data has been sent to the receiving ATSU.
Coordinated	Coordination of the boundary crossing conditions is completed.
Re-Negotiating	Coordination data is being exchange between the controlling ATSU and the receiving ATSU as part of a later coordination dialogue.
Transferring	Air traffic control responsibility for the aircraft is in the process of being transferred to the receiving ATSU.
Transferred	Air traffic control responsibility for the aircraft has been transferred to the receiving ATSU.
Backward- Re-Negotiating	The aircraft is now under the control of the receiving ATSU, but still near the boundary. Changes are being proposed to the coordination conditions while the aircraft is still in the vicinity of the boundary.

Figure D -5
Flight State Transitions Diagram



4.7 A flight state transition diagram is shown in Figure D-5. This diagram depicts graphically how the flight transitions from one state to the next. It can be seen that the ASIA/PAC AIDC messages act as triggers, forcing the necessary state transitions. A description of the allowable flight state transitions, along with the message event that triggers the transition, is given in Table D-4 below.

Table D-4 Flight State Transitions

State Transition	Message Trigger	Description
Pre-Notifying/ Notifying	ABI	An initial ABI begins the Notification phase.
Notifying/ Notifying	ABI	An ABI updates the information a downstream ATSU maintains on a flight that is expected to enter its ACI at some future time. This data can be sent hours in advance of the actual entry.
Notifying/ Pre-Notifying	MAC	A flight that was expected to enter a downstream ATSU's ACI will no longer do so.
Notifying/ Negotiating	CPL	A CPL is used to initiate the Coordination process for an aircraft that will enter the downstream ATSU's ACI. A CPL contains the current clearance to destination.
Notifying/ Coordinating	EST	An EST is used to initiate an Abbreviated Coordination process for an aircraft that will enter the downstream ATSU's ACI.
Notifying/ Coordinating	PAC	A PAC is used to initiate an Abbreviated Coordination process for an aircraft, not yet airborne, that will enter the downstream ATSU's ACI.
Negotiating/ Negotiating	CDN	If the downstream ATSU does not like the current clearance (and boundary crossing conditions), a Negotiation process is carried out using CDNs.
Negotiating/ Coordinated	ACP	The negotiation process is terminated when one ATSU signals its acceptance of the coordination conditions using an ACP.
Coordinating/ Coordinated	ACP	The Abbreviated Coordination dialogue is terminated by the receiving ATSU transmitting an ACP.
Coordinated/ Re-Negotiating	CDN	The coordination dialogue can be re-opened at any time after the initial coordination and before the initiation of the transfer of control procedure.
Re-Negotiating/ Re-Negotiating	CDN	Either ATSU may attempt to change the previously agreed upon coordination conditions any time after the initial coordination dialogue has been completed.
Re-Negotiating/ Coordinated	ACP REJ	An ACP terminates a re-negotiation dialogue, with a new mutually agreed upon profile in effect. An REJ immediately terminates the dialogue, with the coordination conditions remaining as previously agreed (which is usually, but not necessarily, the initial coordination conditions).
Coordinated/ Coordinated	TRU	A TRU may be sent by the controlling ATSU after the initial coordination dialogue has been completed to update previously agreed coordination conditions
Coordinated/ Transferring	TOC	A TOC is sent after Coordination occurs but (usually just) before the boundary is crossed to the accepting ATSU. The TOC informs the accepting ATSU that it now has control authority for the aircraft.
Coordinated/ Pre-Notifying	MAC	A flight that was expected to enter a downstream ATSU's ACI will no longer do so.
Transferring/ Transferred	AOC	The formerly downstream ATSU is now the controlling ATSU.

State Transition	Message Trigger	Description
Transferred/ Backward- Re-Negotiating	CDN	An attempt is made (by either the previous or new controlling ATSU) to change the coordination conditions while the aircraft is near the common boundary.
Backward- Re-Negotiating/ Backward- Re-Negotiating	CDN	Either ATSU may attempt to change the previously agreed upon coordination conditions any time after transfer of control has been completed, but while the aircraft remains in the common boundary region.
Backward- Re-Negotiating/ Transferred	ACP REJ	Similar to a Re-Negotiation/Coordinated state transition. An ACP terminates a backward coordination dialogue, with a new mutually agreed upon profile in effect. An REJ immediately terminates the dialogue, with the coordination conditions remaining as previously agreed (which is usually, but not necessarily, the initial coordination conditions).

5. MESSAGE SEQUENCING

5.1 The preceding section identified the flight states and showed how the aircraft transitions from one state to the next, based on the receipt of ASIA/PAC AIDC messages by ATSU B. In this section, a table of two-message sequences is constructed, as shown in Table D-5. These sequences identify the allowable messages (the next message column) that may correctly follow a given, just received message (the first column). Application Management messages LAM and LRM are not shown.

Table D-5 Message Sequences

Received Message	Next Valid Message	Comments
Notification Sequences		
ABI	ABI	Update the flight information.
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI.
	CPL	Receipt of the ABI signals the beginning of the Notification phase for a particular flight. Coordination will take place when the aircraft is within a parameter distance/time of the boundary.
	EST	Receipt of the ABI signals the beginning of the Notification phase for a particular flight. Coordination will take place when the aircraft is within a parameter distance/time of the boundary.
Coordination Sequences		
CPL	ACP	The aircraft's current clearance is acceptable.
	CDN	The aircraft's current clearance is not acceptable to the receiving airspace and must be modified.
EST	ACP	The boundary crossing conditions are in accordance with the agreement that exists between the two ATSUs.
PAC	ACP	The boundary crossing conditions are in accordance with the agreement that exists between the two ATSUs.
CDN	ACP	The negotiated clearance is acceptable to both ATSUs.
	CDN	The proposed clearance modification is not acceptable to one of the airspaces and a new proposal is submitted.
	REJ	The last clearance agreed to by both airspaces must be honoured.

TRU	CDN	The proposed clearance modification is not acceptable to one of the airspace and a new proposal is submitted.
	TOC	The aircraft is at or near the boundary.
	TRU	Notification of an amendment to the previously accepted clearance
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI
ACP	CDN	A request for modification of a previously accepted clearance is submitted.
	TRU	Notification of an amendment to the previously accepted clearance
	TOC	The aircraft is at or near the boundary.
	MAC	Indicates that the flight is no longer expected to enter the downstream ATSU's ACI.
Transfer of Control Sequences		
TOC	AOC	The aircraft is at or near the boundary.
AOC	CDN	A request for modification of a previously accepted clearance is submitted.

5.2 Table D-6 lists the AIDC messages which are valid for each state. The ATSU which can transmit the message is also identified.

Table D-6 Valid Messages by ATSU

Flight State	Message	Sent by
Notifying	ABI	Controlling ATSU
Notifying	MAC	Controlling ATSU
Notifying	CPL	Controlling ATSU
Notifying	EST	Controlling ATSU
Notifying	PAC	Controlling ATSU
Negotiating	CDN	Either ATSU
Negotiating	ACP	Either ATSU
Coordinating	ACP	Receiving ATSU
Coordinated	CDN	Either ATSU
Coordinated	TRU	Controlling ATSU
Coordinated	TOC	Controlling ATSU
Coordinated	MAC	Controlling ATSU
Re-Negotiating	CDN	Either ATSU
Re-Negotiating	ACP	Either ATSU
Re-Negotiating	REJ	Either ATSU
Transferring	AOC	Receiving ATSU
Transferred	CDN	Either ATSU
Backward-Re-Negotiating	CDN	Either ATSU
Backward-Re-Negotiating	ACP	Either ATSU
Backward-Re-Negotiating	REJ	Either ATSU

6. OTHER MESSAGES

6.0 The previous sections have discussed the use of Notification, Coordination, Transfer of Control, and Application Management messages. There are two remaining message subgroups in the ASIA/PAC AIDC Messages: (1) General Information messages; and (2) Surveillance Data Transfer messages. All messages within these two subgroups require an application response; no operational response is defined.

6.1 General Information Messages.

6.1.1 **EMG and MIS Messages.** These messages support the exchange of text information between ATSUs. A communicator (usually a person, but a computer or application process is also permitted) in one ATSU can send a free text message to a functional address at another ATSU. Typical functional addresses could be an area supervisor or an ATC sector. If further EMG or MIS messages are transmitted in response to a previously received EMG or MIS, the later messages shall include the original message identifier within field 3 of the AFTN header. The EMG shall have an AFTN emergency priority (SS).

6.1.2 **Track Definition Message.** The TDM is generated and disseminated to all affected ATSUs. It is also sent to Airline Operational Control (AOC) Centres, where it is used for flight planning purposes. This message contains, in a structured text format, the track definition and the time when it is active.

6.2 **Surveillance Data Transfer Messages.** The ADS message is used to transfer data contained within an ADS-C report, including optional ADS-C groups, to an adjacent ATSU.

6.2.1 The ADS message contains a text field – the ADS-C data field - which contains information from the ADS-C report in its original hexadecimal format. The ADS-C data field consists of the text that immediately follows the “ADS” IMI (but excluding the 4 character CRC) within the Application data portion of the ADS-C report.

6.2.2 The following example shows an encoded ACARS ADS-C report – as it would be received by an ATSU – as well as an example of what information from this report would be transferred into the corresponding ADS-C data field. The ATSU receiving the AIDC ADS message simply decodes the ADS-C data field, and extracts the data that is required by the ATSU.

ACARS ADS-C report	QU BNECAYA .QXSXMXS 011505 PAR FI NZ0090/AN ZK-OKC DT QXT POR1 011505 F59A - ADS.ZK-OKC030007FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC000E34D0EDC00010140F3E8660F3
ADS-C data field	ADS/.ZK-OKC030007FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC000E34D0EDC00010140F3E86

Note. Because it is part of the 7 character registration field, the leading “.” must be retained in front of the registration (“.ZK-OKC”). The 4 character CRC (“60F3”) at the end of the ACARS message is not included in the ADS-C data field.

6.2.3 The types of ADS-C reports (i.e. periodic or event) transmitted by the AIDC ADS message shall be in accordance with bilateral agreements. When implementing the AIDC ADS message, ATSUs should consider the effect of relaying numerous ADS-C periodic reports via ground-ground links (e.g. AFTN) when a high periodic reporting rate is in effect.

Note 1. The AIDC ADS message is used to transfer ADS-C information only. Other messaging protocols exist for the transfer of ADS-B information.

Note 2. While the AIDC ADS message may be used to transfer ADS-C information this data may also be transferred using the ACARS Ground-Ground network by re-addressing the received ADS-C message to the other ATSU. States should agree the method to be used on a bilateral basis.

Example: Brisbane ATSU (BNECAYA) receives an ADS-C downlink via the ACARS network from its Datalink Service Provider SITA (QXSXMXS)

```
QU BNECAYA
.QXSXMXS 011505
PAR
FI NZ0090/AN ZK-OKC
DT QXT POR1 011505 F59A
-ADS.ZK-OKC0300FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC00
0E34D0EDC00010140F3E8660F3
```

Brisbane re-addresses the downlink and forwards to Auckland via the ACARS Ground-Ground network:

```
QU AKLCBYA
.BNECAYA 011505
PAR
FI NZ0090/AN ZK-OKC
DT QXT POR1 011505 F59A
-ADS.ZK-OKC0300FF946B6F6DC8FC044B9D0DFC013B80DA88FC0A64F9E4438B4AC8FC00
0E34D0EDC00010140F3E8660F3
```

7. EXAMPLES

7.1 Standard Coordination

7.1.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.1.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1213). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.1.3 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 1. Standard coordination

Brisbane	Auckland
(ABI-QFA108-YBBN-33S163E/1209F350 -NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E ...)	
(EST-QFA108-YBBN-33S163E/1213F350-NZCH)	
	(ACP-QFA108-YBBN-NZCH)
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)

7.2 Negotiation of coordination conditions

7.2.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA56 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.2.2 The coordination message (CPL) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1213).

7.2.3 Auckland responds with a negotiation message (CDN) requesting a change in the boundary crossing altitude to F390. Brisbane responds with an ACP, indicating that the revised altitude is acceptable.

7.2.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 2. Negotiation of Coordination Conditions

Brisbane	Auckland
(ABI-QFA56-YBBN-33S163E/1209F350-NZCH- 8/IS-9/B744/H-10/SDHIWRJ-15/M084F350 35S164E 36S165E ...)	
(CPL-QFA56-IS-B744/H-SDHIWRJ-YBBN -33S163E/1213F350-M084F350 35S164E 36S165E NZCH -0.)	
	(CDN-QFA56-YBBN-NZCH -14/33S163E/1213F390)
(ACP-QFA56-YBBN-NZCH)	
(TOC-QFA56-YBBN-NZCH)	
	(AOC-QFA56-YBBN-NZCH)

7.3 Re-negotiation rejected

7.3.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.3.2 The coordination message (CPL) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1213). Auckland accepts the proposed coordination conditions without modification by responding with an ACP.

7.3.3 Some time after the initial coordination process has been completed, but before the start of the Transfer of Control process, Auckland requests an amendment to the boundary crossing altitude by transmitting a negotiation message (CDN). Brisbane cannot accept the proposed change due to conflicting traffic in its FIR, and therefore rejects the request (REJ).

7.3.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 3. Rejection of Renegotiated Coordination

<i>Brisbane</i>	<i>Auckland</i>
(ABI-QFA108-YBBN-33S163E/1209F350 -NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E ...)	
(CPL-QFA108-IS-B744/H-SDHIWRJ-YBBN -33S163E/1213F350-M084F350 35S164E 36S165E NZCH-0 ...)	
	(ACP-QFA108-YBBN-NZCH)
	(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F390)
(REJ-QFA108-YBBN-NZCH)	
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)

7.4 **Abbreviated coordination**

7.4.1 Several minutes before AAA842's departure time (eg at taxi time), coordination between Bali and Brisbane is effected by Bali transmitting a coordination message (PAC). This message alerts Brisbane that the flight is pending, and indicates a boundary estimate of 1213 at F290. Brisbane accepts the coordination conditions by responding with an ACP.

7.4.2 On departure, the aircraft's actual estimate differs from that coordinated by more than the value specified in bilateral agreements. The new estimate is coordinated to Brisbane by Bali transmitting a CDN message to Brisbane. Brisbane accepts this revised estimate by responding with an ACP message.

7.4.3 Bali transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Brisbane accepts ATC responsibility by responding with an AOC.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 4. Abbreviated coordination

Bali	Brisbane
(PAC-AAA842/A4534-IS-B737/M-WRRR-OGAMI/1213F290-YPPH ...)	
	(ACP-AAA842/A4534-WRRR-YPPH)
(CDN-AAA842/A4534-WRRR-YPPH-14/OGAMI/1219F290)	
	(ACP-AAA842/A4534-WRRR-YPPH)
(TOC-AAA842/A4534-WRRR-YPPH)	
	(AOC-AAA842/A4534-WRRR-YPPH)

7.5 Multiple notifications + AIDC cancellation

7.5.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA11 is expected to cross the FIR boundary (1105). The destination of the flight is Los Angeles.

7.5.2 Prior to transmitting the coordination message, a modification to the cleared flight level is made resulting in the transmission of another notification message. This ABI contains the latest boundary information on the aircraft, showing that the current boundary estimate is now 1107.

7.5.3 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1108). Auckland accepts the proposed coordination conditions by responding with an ACP

7.5.4 Due to weather QFA11 requests, and is issued, an amended route clearance that will now no longer affect Auckland. To advise of the cancellation of any previously transmitted AIDC messages, a MAC message is transmitted to Auckland.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 5. Multiple notifications + AIDC cancellation

Brisbane	Auckland
(ABI-QFA11-YSSY-31S163E/1105F290-KLAX-8/IS-9/B744/H-10/SDHIWRJ-15/M085F290 33S158E 30S168E ...)	
(ABI-QFA11-YSSY-31S163E/1107F310-KLAX-8/IS-9/B744/H-10/SDHIWRJ-15/M084F290 33S158E 30S168E ...)	
(EST-QFA11-YSSY-31S163E/1108F310-KLAX)	
	(ACP-QFA11-YSSY-KLAX)
(MAC-QFA11-YSSY-KLAX)	

7.6 Multiple negotiations

7.6.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that QFA108 is expected to cross the FIR boundary (1209). The destination of the flight is Christchurch.

7.6.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1213). Auckland accepts the proposed coordination conditions by responding with an ACP

7.6.3 QFA108 requests F370. The bilateral Letter of Agreement between Brisbane and Auckland requires that prior coordination is required before issuing a change of level after initial coordination. Brisbane transmits a negotiation message (CDN) proposing a change of level to F370. This level is not available in Auckland's airspace but an alternative level is available. Auckland therefore responds with a negotiation message proposing F360. Brisbane responds with an ACP, indicating that this level is acceptable to Brisbane (and to QFA108).

7.6.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

Note1. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Note2. Complex re-negotiations may be more easily solved by voice communication

Example 6. Multiple negotiations

<i>Brisbane</i>	<i>Auckland</i>
(ABI-QFA108-YBBN-33S163E/1209F350 -NZCH-8/IS-9/B744/H-10/SDHIWRJ -15/M084F350 35S164E 36S165E ...)	
(EST-QFA108-YBBN-33S163E/1213F350-NZCH)	
	(ACP-QFA108-YBBN-NZCH)
(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F370)	
	(CDN-QFA108-YBBN-NZCH -14/33S163E/1213F360)
(ACP-QFA108-YBBN-NZCH)	
(TOC-QFA108-YBBN-NZCH)	
	(AOC-QFA108-YBBN-NZCH)

7.7 Standard coordination with proposed amended destination

7.7.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that ANZ136 is expected to cross the FIR boundary (1400). The destination of the flight is Christchurch.

7.7.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate (which is now 1401). Auckland accepts the proposed coordination conditions by responding with an ACP.

7.7.3 ANZ136 requests a deviation to Auckland (NZAA). Brisbane transmits a Coordination message (CDN) to Auckland proposing changes to the previously agreed coordination conditions (route and boundary estimate) as well as the new destination. Auckland accepts the proposed revision(s) by the transmission of an ACP. All subsequent AIDC messages for ANZ136 contain “NZAA” as the destination aerodrome.

7.7.4 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 7. Coordination of amended destination

<i>Brisbane</i>	<i>Auckland</i>
(ABI-ANZ136-YBBN-RUNOD/1400F350 -NZCH-8/IS-9/A320/M-10/SDHIWR -15/M078F350 SCOTT Y32 LOKET L503 LALAP DCT ...)	
(EST-ANZ136-YBBN-33S163E/1401F350- NZCH)	
	(ACP-ANZ136-YBBN-NZCH)
(CDN-ANZ136-YBBN-NZCH- 14/ESKEL/1357F350-15/ SCOTT Y32 LOKET WOOLY ESKEL L521 AA- DEST/NZAA)	
	(ACP-ANZ136-YBBN-NZCH)
(TOC-ANZ136-YBBN-NZAA)	
	(AOC-ANZ136-YBBN-NZAA)

7.8 Standard coordination including FAN/FCN exchange

7.8.1 Brisbane transmits a notification message (ABI) to Auckland forty five minutes prior to the time that UAL815 is expected to cross the FIR boundary (0330).

7.8.2 The abbreviated coordination message (EST) is transmitted by Brisbane thirty minutes prior to the boundary estimate. Auckland accepts the proposed coordination conditions by responding with an ACP.

7.8.3 Brisbane transmits a FAN message to Auckland providing the logon information that Auckland requires to establish a CPDLC connection as well as ADS contracts.

7.8.4 When a CPDLC connection is established, Auckland transmits an FCN to Brisbane, containing the appropriate frequency for the aircraft to monitor.

7.8.5 Brisbane transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Auckland accepts ATC responsibility by responding with an AOC.

7.8.6 Brisbane terminates the CPDLC connection with UAL815, and transmits an FCN to Auckland to advise them that the CPDLC connection has been terminated.

Note. The timing of the transmission of these messages is defined in bilateral agreements between the two units.

Example 8. Standard coordination including FAN and FCN exchanges

<i>Brisbane</i>	<i>Auckland</i>
(ABI-UAL815/-YSSY-3200S16300E/0330F290-KLAX-8/IS-9/B744/H-10/SDHIRZYWJP/CD-15/N0499F310 NOBAR A579 JORDY DCT 3200S16000E 3050S16300E 2800S16500E..)	
(EST-UAL815-YSSY-33S163E/0330F290-KLAX)	
	(ACP-UAL815-YSSY-KLAX)
(FAN-UAL815-YSSY-KLAX-SMI/FML FMH/UAL815 REG/N123UA FPO/3330S15910E FCO/ATC01 FCO/ADS01)	
	(FCN-UAL815-YSSY-KLAX-CPD/2-FREQ/13261)
(TOC-UAL815-YSSY-KLAX)	
	(AOC-UAL815-YSSY-KLAX)
(FCN-UAL815-YSSY-KLAX-CPD/0)	

7.9 Standard coordination with TRU update

7.9.1 An abbreviated coordination message (EST) is transmitted by Melbourne as soon as UAE412 departs Sydney. Brisbane accepts the proposed coordination conditions by responding with an ACP.

7.9.2 The Sydney Departures controller assigns the aircraft a heading of 100 degrees magnetic and issues an instruction to maintain F200. A TRU is transmitted to update the Brisbane controllers' flight details.

7.9.3 Melbourne transfers ATC responsibility approaching the FIR boundary by transmitting a TOC. Brisbane accepts ATC responsibility by responding with an AOC.

Example 9. Coordination of amended clearances via TRU

<i>Brisbane</i>	<i>Auckland</i>
(EST-UAE412-YSSY-EVONN/0130F280-NZAA)	
	(ACP-UAE412-YSSY-NZAA)
(TRU-UAE412-YSSY-NZAA-HDG/100 CFL/F200)	
(TOC-UAE412-YSSY-NZAA)	
	(AOC-UAE412-YSSY-NZAA)

8. NOTES

8.1 The IGM concerns communications between two ATSU'S within the ASIA/PAC Regions. Inter-center communications within one country, and communications with ATSUs outside the ASIA/PAC regions, though important to an ATC system's design and implementation, are not part of the scope of this material.

APPENDIX E - RELATIONSHIP TO ICAO AIDC MESSAGES

1. The AIDC message set can be tailored to satisfy regional requirements. The OPLINKP documentation defining the AIDC data link application provides three means for achieving regional adaptation of the AIDC messages:

- a) Regions select an AIDC subset that will support their regional operational procedures;
- b) The selected messages are tailored by mandating the usage of optional components into one of three classes:
 - (1) the optional component that must always be used;
 - (2) the optional component that must never be used;
 - (3) the optional component is truly optional;
- c) For interim, pre-ATN implementations, encoding rules may be specified by a region. The most frequently used encoding rules today employ ICAO ATS fields and messages. The default encoding rules are the ISO Packed Encoding rules.

2. Using the regional tailoring procedures stated above, the ASIA/PAC Core messages are related to a subset of the AIDC messages and are shown in Table E-1.

3. The encoding rules employed within the ASIA/PAC will remain for the foreseeable future as the ICAO ATS field and message-based, character-oriented rules currently defined in the ASIA/PAC AIDC Interface Control Document (ICD) (and ICAO PANS-ATM Doc 4444).

Table E –1 ASIA/PAC AIDC/ICAO AIDC Relationship

ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message
		Mandatory fields		Optional fields	
Notify	ABI	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Boundary estimate data Number of aircraft Aircraft type Wake turbulence category Route	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Flight rules Equipment Other information Amended destination
Coordinate Initial	CPL	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Boundary estimate data Flight rules Number of aircraft Aircraft type Wake turbulence category Equipment Route Other information	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	

ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message
		Mandatory fields		Optional fields	
Coordinate Initial	EST	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Boundary estimate data	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	
Coordinate Initial	PAC	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Boundary estimate data	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Flight rules Number of aircraft Aircraft type Wake turbulence category Equipment Route Other information.
Coordinate Negotiate	CDN	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	Equipment Boundary estimate data Route Other information Amended destination

ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message
		Mandatory fields		Optional fields	
Coordinate Accept	ACP		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Reject	REJ		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Standby	N/A			Aircraft identification Departure aerodrome Destination aerodrome	
Coordinate Cancel	MAC	Aircraft identification Departure aerodrome Destination aerodrome	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Fix Reason for cancellation	Boundary Estimate Data Other Information
Coordinate Update	TRU	Aircraft identification Departure aerodrome Destination aerodrome Boundary estimate data	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Track data	Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Amended destination Code (SSR) Other information	
Transfer Initiate	N/A	Aircraft identification Executive data (if available)		Track data	
Transfer Conditions Proposal	N/A	Aircraft identification Executive data (if available)		Track data	

ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message
		Mandatory fields		Optional fields	
Transfer Conditions Accept	N/A	Aircraft identification		Frequency	
Transfer Communication Request	N/A	Aircraft identification		Frequency	
Transfer Communication	N/A	Aircraft identification Executive data and/or Release indication (if available)		Frequency Track data	
Transfer Communication Assume	N/A	Aircraft identification			
Transfer Control	TOC	Aircraft identification	Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Departure aerodrome Destination aerodrome Executive data	
Transfer Control Assume	AOC	Aircraft identification	Aircraft identification, SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome	Departure aerodrome Destination aerodrome	
General Point	N/A	Aircraft identification Departure aerodrome Destination aerodrome		Sector designator (sending) Sector designator (receiving) Flight rules Type of flight Number of aircraft (if more than one in the flight) Aircraft type Wake turbulence category CNS equipment Route Track data Code (SSR) Other information	

ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message	ICAO AIDC message	ASIA/PAC AIDC message
		Mandatory fields		Optional fields	
General Executive Data	N/A	Aircraft identification		Executive data Frequency	
Free Text Emergency	EMG	Facility designation or Aircraft identification Free text	Functional address or Aircraft identification SSR Mode and Code (where applicable) Other information		
Free Text General	MIS	Facility designation or Aircraft identification Free text	Functional address or Aircraft identification SSR Mode and Code (where applicable) Other information		
Application Accept	LAM				
Application Reject	LRM	Error code	Other Information	Error data	
N/A	ASM				
N/A	FAN		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Application data		
N/A	FCN		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome Communication Status		
N/A	ADS		Aircraft identification SSR Mode and Code (where applicable) Departure aerodrome Destination aerodrome ADS-C data		

APPENDIX F - INTERIM OPERATIONAL SUPPORT**1. INTRODUCTION**

1.1 This ICD describes the end-state messages to be used within the ASIA/PAC region to ensure interoperability between automated ATS systems. However, during the transition to this end state architecture, current operations must be documented and supported. This appendix is the repository of messages not found in other ICD sections which will be used to support current operations during the interim transition period.

1.2 Each interim message will be described in a separate paragraph. Those ATS Providers employing an interim message contained in this appendix shall document this usage in the appropriate bilateral agreements.

2. INTERIM MESSAGES**2.1 Estimate (EST) Message**

2.1.1 The Estimate message is contained within the Core Message set. However, its use has been constrained to those situations in which a flight will cross an FIR boundary in accordance with existing letters of agreement.

2.1.2 An EST message may be used in any situation in which a CPL is permitted. The EST is in actuality an abbreviated CPL, contingent upon prior receipt of route and ancillary information. This information could be provided by an FPL or ABI message.

2.1.3 Those ATS Provider States employing an EST in the more general manner during the interim transition period shall document this usage in the appropriate bi-lateral agreements.

2.1.4 The EST message format shall be as described in the Core Message set.

APPENDIX G – TEMPLATES FOR BILATERAL LETTER OF AGREEMENT ON AIDC

1. At an organisational level, the implementation of AIDC to enable data transfers between automated ATS systems is accomplished under the authority and strict operational terms of a bilateral letter of agreement or memorandum of understanding on AIDC arrangements that must be established between the two ATSUs involved. Depending on the particular circumstances, the legally less sophisticated Memorandum of Understanding (MOU) format could be used for the initial implementation of AIDC until the more formalised Letter of Agreement (LOA) is put in place. The choice of legal instrument will be a decision made by the two ATSUs as they prepare the formal agreement to enable AIDC data transfer between States.

2. In order to provide guidance in the structure and content of bilateral arrangements, templates have been included in this appendix to assist States in preparing suitable memorandums of understanding/letters of agreement on AIDC arrangements. The templates are based upon documentation developed by Airways New Zealand in implementing evolving AIDC arrangements between Auckland Oceanic and all neighbouring States over a period of approximately 10 years commencing from the mid 1990's. Three templates are included:

- Template 1 provides a generic example of a basic Letter of Agreement;
- Template 2 is an example of an actual Letter of Agreement between Auckland Oceanic (New Zealand) and Brisbane ATS Centre (Australia); and
- Template 3 is an example of an actual Memorandum of Understanding between Auckland Oceanic (New Zealand) and Nadi ATM Operations Centre (Fiji).

3. The templates are intended as guidance material only. It is important to note that although changes in the AIDC arrangements applicable to Auckland Oceanic will occur over time, Templates 2 and 3 will NOT be routinely updated. Accordingly, as the circumstances for each bilateral implementation will differ, appropriate adjustments should be made to the content of the templates to ensure that the resulting MOU or LOA is fit for the purpose intended.

Template 1
Generic Letter of Agreement

AIDC Procedures

- AIDC Procedures**
1. The format of AIDC messages (*List messages used e.g. ABI, PAC, CDN, CPL, ACP, REJ, MAC, LAM, and LRM*) are as defined by the Asia/Pacific Regional AIDC Interface Control Document (ICD) as amended from time to time, unless described otherwise in this LOA.
 2. List messages not supported (e.g. “EST, TOC, AOC) messages are not supported”.
 3. Acceptance of a CPL or CDN message is approval of the flight's profile and requires no further voice coordination (i.e., Non-Standard Altitudes, Block Altitudes, Deviations).
 4. (*Describe other procedures applicable to the use of AIDC for this LOA. Some examples are listed below.*)
 5. *Example only. If there is any doubt with regard to the final coordination data, voice coordination shall be used for confirmation.*
 6. *Example only. Receipt of a MAC message must not be interpreted as meaning that the flight plan has been cancelled. Voice coordination must be conducted by the transferring controller to confirm the status of the flight.*
 7. *Example only. Each facility shall advise the other facility of any known equipment outage that affects AIDC. In the event of AIDC outage, voice coordination procedures will apply.*
 8. *Example only. Truncation. Where route amendment outside the FIR is unavoidable:*
 - a) *Terminate the route details at the farthest possible flight plan significant point of the flight and enter “T” immediately following this.*
 - b) *Without amending the originally received details, every effort is to be made to truncate the route at a minimum of one significant point beyond the adjacent FIR to provide an entry track into that FIR.*

Letter of Agreement

AIDC Messages

(For each message used describe when it will be sent by each ATSU under the parameter column and use the Notes column to describe other applicable information for the message use by each ATSU. The data below provides an example of the type of information that could be incorporated)

Messages	Parameter	Notes
ABI	ATSU1 : Sends ABI approx. 80 minutes prior to boundary (73 min prior to the 50 nm expanded sector boundary). ATSU2 : Sends ABI approx. 87 minutes prior to boundary (80 min prior to the 50 nm expanded sector boundary). (Note: An updated ABI will not be sent once a CPL has been sent.)	ATSU1 : ATSU2 Updated ABI's will be sent automatically if there is any change to profile. ABI is sent automatically and is transparent to the controller. ABI automatically updates the receiving unit's flight data record.
CPL	ATSU1 : ATSU2 Send CPL messages approx 37 minutes prior to the Boundary (30 minutes prior to the 50 nm expanded sector boundary).	ATSU1 : ATSU2 CPL messages should be sent by the transferring controller in sufficient time to allow the completion of coordination at least 30 minutes prior to the boundary or 30 minutes prior to the aircraft passing within 50 nm of the FIR boundary for information transfers.
CDN	ATSU1 : ATSU2 CDN messages are sent by either the transferring or receiving facility to propose a change once the coordination process has been completed, i.e., CPL sent and ACP received. CDN's must contain all applicable profile restrictions (e.g., weather deviations, speed assignment, block altitude). If the use of a CDN does not support this requirement, then verbal coordination is required.	ATSU1 : ATSU2 The APS will display a flashing "DIA" until receipt of ACP. If ACP not received within ten (10) minutes controller is alerted with a message to the queue. CDN messages are not normally used for coordination of reroutes; however, with the receiving facilities approval a CDN may be used to coordinate a reroute on a critical status aircraft such as in an emergency.

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Letter of Agreement

AIDC Messages, Continued

Messages	Parameter	Notes
PAC	ATSU1 : ATSU2 <i>PAC messages will normally be sent when the time criteria from the departure point to the boundary is less than that stipulated in the CPL.</i>	ATSU1 : ATSU2 <i>Will respond to a PAC message with an ACP. PAC messages shall be verbally verified with receiving facility.</i>
ACP	ATSU1 : ATSU2 <i>ACP messages are in reply to a CPL/CDN message if conditions specified in CPL/CDN are acceptable to controller.</i>	ATSU1 : ATSU2 <i>The APS will display a flashing “DIA” until receipt of ACP. If ACP not received within ten (10) minutes controller is alerted with a message to the queue.</i>
TOC	ATSU1 : ATSU2 <i>Not supported. Implicit hand in/off.</i>	
AOC	ATSU1 : ATSU2 <i>Not supported. Implicit hand in/off.</i>	
MAC	ATSU1 : ATSU2 <i>MAC messages are sent when a change to the route makes the other facility no longer the “next” responsible unit.</i>	ATSU1 : ATSU2 <i>Receipt of a MAC message must not be interpreted as meaning that the flight plan has been cancelled. Voice coordination must be conducted by the transferring controller to confirm the status of the flight.</i>
REJ	ATSU1 : ATSU2 <i>REJ messages are sent in reply to a CDN message when the requested change is unacceptable.</i>	ATSU1 : ATSU2 <i>REJ messages are sent only as a response to a CDN message.</i>

Template 2
Example: Auckland Oceanic - Brisbane ATS Centre

Letter of Agreement

Coordination - General

Transfer of Control Point The Transfer of Control Point (TCP) shall be either on receipt of an Acceptance of Control (AOC) to a Transfer of Control (TOC) or the common FIR boundary, whichever occurs first. The TCP shall also be the point of acceptance of primary guard.

All ATS units shall coordinate an estimate for the FIR boundary at least thirty (30) minutes prior to the boundary. Such coordination constitutes an offer of transfer of responsibility.

After the estimate for the FIR boundary has been sent, units shall coordinate any revised estimate that varies by 3 minutes or more.

Communication Systems Use of communications systems for coordination between adjacent units shall be in the following order of priority:

- ATS Interfacility Data Communication (AIDC);
- AIDC messages and procedures are specified in the following sections;
- ATS direct speech circuits;
- International telephone system;
- Any other means of communication available.

AIDC Messages AIDC message format will be in accordance with the Asia/Pacific Regional Interface Control Document (ICD), as amended from time to time, unless described otherwise in this LOA.

Successful coordination via AIDC occurs on receipt of an ACP message in response to an EST message.

Each centre shall advise the other of any known equipment outage that affects AIDC.

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Letter of Agreement

Coordination - General, Continued

AIDC Message Parameters The following table details the AIDC parameters and messages to be used.

Message	Parameter	Notes
ABI	EUROCAT: 5-60 minutes prior to COP (Note: An updated ABI will not be sent once an EST has been sent) OCS: 40 minutes prior 50nm expanded boundary	ABI is sent automatically and is transparent to controller. ABI automatically updates flight plan.
EST	<u>EUROCAT</u> : 40 minutes prior to COP <u>OCS</u> : 30 minutes prior to 50nm expanded boundary.	Any change to EST level or estimate conditions as detailed in LOA to be notified by voice after initial coordination completed. See notes below on voice procedures. EST is required for track generation in EUROCAT.
ACP	EUROCAT: Sends automatic ACP on receipt of EST OCS: Sends automatic ACP on receipt of EST	EUROCAT: If ACP not received within 4 minutes the sending controller is alerted. Sending controller will initiate voice coordination if ACP is not received within 4 minutes of sending EST. Receiving controller will initiate voice coordination if proposed EST conditions are not acceptable. OCS: If ACP is not received within 5 minutes the sending controller is alerted. Sending controller will initiate voice coordination if ACP is not received within 5 minutes of sending EST. Receiving controller will initiate voice coordination if proposed EST conditions are not acceptable.
TOC	EUROCAT: Sent automatically 5 minutes prior to boundary OCS: Sent automatically 2 minutes prior to boundary	
AOC	EUROCAT: Sent automatically on controller acceptance of a TOC OCS: Sent automatically on receipt of a TOC	

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Letter of Agreement

Coordination – General, Continued

AIDC Message Parameters (continued)

Message	Parameter	Notes
CDN	EUROCAT: Manually by the controller when required.	- Responses to the CDN shall be ACP or REJ only – there will be no CDN negotiations. - CDN messages will be sent by Brisbane only to revise coordination on eastbound flights - CDN messages may be used to coordinate changes to estimate or assigned altitude only - Only one CDN dialogue may be open per aircraft at any time - Not to be used if the aircraft will not be maintaining the assigned altitude 10 minutes prior to the TCP.
MAC	As per ICD	
LRM	As per ICD. Controller alerted on receipt	
LAM	As per ICD. Controller alerted on non-receipt	

Amendment to Flight Data Record

Route amendment – routes/waypoints may be added/deleted as long as they do not change the original intent or integrity of the flight plan information.

Truncation – where route amendment outside the FIR is unavoidable:

- Terminate the route details at the farthest possible ‘flight planned’ point of the flight outside the FIR and enter “T” immediately following this.
- If insufficient ‘flight planned’ points exist outside the FIR for truncation, insert the first ‘defined’ point in the adjoining FIR and enter “T” immediately following this.
- The minimum acceptable truncation point must be at least the first point in the adjoining FIR.
- Every effort is to be made to truncate the route at a minimum of one point beyond the adjacent international FIR to provide an entry track in to that FIR.

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Letter of Agreement**Coordination – General, Continued**

Address Forwarding and Next Data Authority Brisbane ATSC and Auckland OAC shall send automatic Next Data Authority (NDA) and Address Forwarding (CAD) for data link aircraft as per the following table:

Brisbane ATSC	Auto NDA sent 22 minutes prior to the FIR boundary Auto CAD sent 20 minutes prior to the FIR boundary
Auckland OAC	Auto NDA sent 40 minutes prior to the FIR boundary Auto CAD sent 35 minutes prior to the FIR boundary

Voice Coordination

Voice coordination is not required when AIDC messaging has been successful to offer and accept transfer of control.

However, the receiving controller will initiate voice coordination if the proposed AIDC EST conditions are not acceptable.

If AIDC messaging is not to be sent following voice coordination, it shall be stated as part of the voice coordination by use of the phrase “AIDC messaging will not be sent”. A readback of the phrase is required.

Voice coordination is required for aircraft operating under any of the following conditions:

- block level clearance;
- weather deviations;
- offset track; or
- Mach Number technique.

Readbacks shall comprise all elements of the voice coordination passed by the transferring controller. Readback by the receiving unit confirms acceptance of the offer of transfer of control, subject to any other conditions negotiated.

Hemstitch Flights

A hemstitch flight is any flight that will remain within the New Zealand FIR for less time than the NDA VSP (40 minutes) prior to the flight entering the Brisbane FIR.

Auckland AOC shall voice coordinate any hemstitch flight.

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Letter of Agreement**Coordination – General, Continued**

Near Boundary Operations	ATS units shall relay significant details of any flight which is, or intends, operating within fifty nautical miles (50NM) of the common FIR boundary.
HF Frequencies	Brisbane ATC and Auckland ATC shall update each other as to the current voice backup frequency for use by ATC data link equipped aircraft.

Template 3**Example: Auckland Oceanic - Nadi ATM Operations Centre**

Memorandum of Understanding
Between
Airways New Zealand Limited
And
Nadi ATM Operations Centre

Subject **Air Traffic Service Inter-facility Data Communications (AIDC) Coordination Procedures**

Validity Period This Memorandum of Understanding shall be effective from 0506300300 UTC and may be cancelled by either party with written notice.

Signatories The following signatories have ratified this Agreement:

Authority	Signature	Date
<i>(Name of Officer)</i> Oceanic Business Unit Manager Airways New Zealand		
<i>(Name of Officer)</i> Manager Operations Strategic Air Services Limited Fiji		
<i>(Name of Officer)</i> Chairman ATM Projects Committee Airports Fiji Limited Fiji		

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Memorandum of Understanding, Continued

Purpose	To establish procedures to permit AIDC messages for coordination purposes to be transmitted by Auckland Oceanic and received by Nadi Air Traffic Management Operations Centre (ATMOC).
Scope	This MOU between Auckland and Nadi is supplementary to the procedures contained in the Airways Corporation of New Zealand limited and Airports Fiji Limited LOA, dated 25 November 2004. Revision to this MOU shall be made only with the concurrence of all parties.
Procedures	8. The format of AIDC messages (ABI, EST, PAC, CDN, CPL, ACP, REJ, TOC, AOC, MAC, LAM, and LRM) are as defined by the Asia/Pacific Regional AIDC Interface Control Document (ICD) Version 2.0. The optional formats for the coordination of block levels, weather deviations and Mach Number Technique have not been implemented. 9. Each facility shall advise the other facility of any known equipment outage that affects AIDC. In the event of AIDC outage, voice coordination procedures will apply. 10. The following table details the messaging parameters and additional information for each message.

Messages	Parameter	Notes
ABI Non Hem-stitching flights	Auckland: Sends ABI 48 minutes prior to Boundary (Note: An updated ABI will not be sent once an EST has been sent)	Updated ABI's will be sent automatically if there is any change to profile. ABI is sent automatically and is transparent to the controller. ABI automatically updates the receiving units flight data record
EST (general) Non Hem-stitching flights	Auckland: Sends EST 38 minutes prior to Boundary	EST is sent automatically, and automatically coordinates the receiving unit's flight data record. Any change to the EST (level or estimate) conditions as detailed in LOA are to be notified by voice after the initial coordination completed. See section below on voice procedures.

Continued on next page

Memorandum of Understanding, Continued

ABI & EST Hemstitch flights	Auckland: Sends the ABI and EST message for flights that re-enter the Nadi FIR as soon as the aircraft enters the NZZO FIR	In these cases the ABI and EST are sent automatically.
PAC	Auckland: Voice coordination will take place in those situations when a PAC is sent.	
ACP	Auckland: Sent automatically on receipt of EST Nadi: Sent automatically on receipt of EST or PAC.	Auckland: The APS will display a flashing “DIA” until receipt of ACP. If ACP not received within ten (10) minutes controller is alerted with a message to the queue.
TOC	Auckland: Sent automatically 2 minutes prior to boundary	This proposes a hand-off to the receiving unit
AOC	Auckland: Sent automatically on receipt of TOC. Nadi: Sent by the controller on acceptance of TOC.	This completes the hand-off proposal.
MAC	Auckland: Sent manually when a change to the route makes Nadi no longer the “next” responsible unit.	Receipt of a MAC message should not be interpreted as meaning that the flight plan has been cancelled Voice coordination should be conducted by the receiving controller to confirm the status of the flight.

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Memorandum of Understanding, Continued**Procedures**
Continued

4. Block levels, offsets, and weather deviations, or Mach Number Technique are not included in the current version of AIDC messaging. Voice coordination shall be conducted for aircraft operating under these circumstances.
5. If there is any doubt with regard to the final coordination conditions, voice coordination shall be used for confirmation.
6. Truncation – Where route amendment outside the FIR is unavoidable:
 - b) Terminate the route details at the farthest possible ‘flight planned’ point of the flight and enter “T” immediately following this.
 - c) Without amending the originally received details, every effort is to be made to truncate the route at a minimum of one point beyond the adjacent FIR to provide an entry track in to that FIR.
7. For any reason where changes to this MOU are advisable the requesting unit shall propose the pertinent revision. The revision should be emailed or faxed to the appropriate Manager for action. The Manager or their designated deputies shall agree by email or telephone, followed by a confirming fax message signed by all parties. Formal exchange of signed copies of the amended MOU shall take place as soon as practicable thereafter.

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Memorandum of Understanding, Continued**Hemstitch
Flights**

A hemstitch flight is any flight that vacates FIR 1 and transits FIR 2, before re-entering FIR1.

When a hemstitching flight vacates FIR 1 and then re-enters FIR 1 from FIR 2, 30 mins or less later, the re-entry coordination is considered to have been completed when coordination for the initial entry is completed and further coordination is only required if the aircraft requests

- A weather deviation or
 - A level change
- or
- Any change to the EST time is received or
 - If there is any doubt that the receiving FIR has the correct boundary information.

AIDC messages (ABI and EST) will still be sent by Auckland but only when the aircraft flight state becomes active control. For hem stitching flights this will usually be when the aircraft enters the NZZO FIR, therefore these messages will normally be sent at less than 30 minutes prior to the TCP.

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Memorandum of Understanding, Continued**Voice
Coordination**

The following is provided as a summary of occasions when voice coordination is required:

- In the event of an AIDC outage;
- Aircraft operating under any of the following conditions:
 - block level clearance;
 - unfulfilled time constraints;
 - weather deviations;
 - offset track; or
 - Mach Number technique.
- Any change to the EST (level or time) conditions
- On receipt of a warning that an ACP has not been received;
- On receipt of a MAC message;
- If there is any doubt with regard to the final coordination conditions
- If the receiving controller can not accept the aircraft at the coordinated level;

Notwithstanding the above, voice coordination shall take place for any flight that departs an airfield within the NZZO FIR and enters the NFFF FIR within 30 mins after departure.

For aircraft on fixed routes this specifically applies to :

- Aircraft departing Norfolk and entering the Nadi FIR via UBDAK or OSVAR;
- Aircraft departing Fua'amotu and entering the Nadi FIR via APASI;
- Aircraft departing Faleolo and entering the Nadi FIR via OVLAD or KETOT

Auckland OCA will obtain the appropriate level approval for these flights and will pass Nadi an "Estimate" based on the aircrafts probed profile at the same time as obtaining the level approval.

A PAC message will also be sent containing the time at the TCP and the climbing condition.

Time revisions will only be passed when the "Estimated" time changes by more than 2 minutes from that previously passed.

Level changes to that previously coordinated and/or off track requests shall be verbally coordinated in the usual manner.

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Memorandum of Understanding, Continued**Notification of
Descent
Restrictions by
Nadi**

Auckland OCS controllers may issue descent to aircraft entering the NZZO FIR from the NFFF FIR and landing at Norfolk, Tonga or Samoa without requesting descent restrictions from Nadi provided descent is commenced after the aircraft has passed the following positions. Should Nadi have any restrictions for descent they will advise Auckland at least 10 mins prior to these positions.

For aircraft entering the NZZO FIR via:

- UPDAK descent to commence after NOGOL
- OSVAR descent to commence after OSVAR minus 10 mins
- APASI descent to commence after APASI
- All other occasions' descent to commence after the aircraft has crossed the FIR boundary.

STATE ATS SAFETY CONTACT POINTS

APANPIRG Conclusion 16/62 required the nomination by States of a Contact Officer or position to act as the focal point for ATS safety-related activities and in particular for the submission and coordination of ATS incident reports. The ICAO Asia and Pacific Regional Office (Bangkok, Thailand) maintains the following list in this regard.

Attention is drawn to the provisions in the ICAO Air Traffic Services Planning Manual (Doc 9426), Part II, Section 1, Chapter 3 – *ATS Incident Reporting* in relation to the reporting and investigation of ATS incidents.

(Last Updated 6 July 2007)

	Name	Title/Organization	TEL/FAX Number	E-mail
1.	AUSTRALIA			
	Mr. Jason Harfield	General Manager, Safety Management Group Airservices Australia PO Box 367 Canberra, ACT 2601 Australia	Tel +61-2-6268-4601 Fax +61-2-6268-5695	jason.harfield@airservicesaustralia.com
2.	BANGLADESH			
	Mr. Mohammad Kaisar Alam	Director (Flight Safety & Regulations) Civil Aviation Authority, Bangladesh FSR Division CAAB Headquarters, Kurmitola Dhaka – 1229 Bangladesh	Tel + 8802 891 1126 Fax + 8802 891 3322 + 8802 891 4709	dfscaab@accesstel.net
3.	BHUTAN			

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	Name	Title/Organization	TEL/FAX Number	E-mail
4.	BRUNEI DARUSSALAM			
	Mr. Ali Hj Mohammad Yusof	Operations Officer-Airworthiness Department of Civil Aviation Ministry of Communications Brunei International Airport Bandar Seri Begawan BB2513 Negara Brunei Darussalam	Tel: (673)(2)2330142, 2332741 Fax: (673)(2)2331706, 2345345	alex_keasberry@civil-aviation.gov.bn aliyhms@yahoo.com
5.	CAMBODIA			
	Mr. Keo Sivorn	Director of Flight Operations and Air Safety, Directorate General of Civil Aviation State Secretariat of Civil Aviation No. 62, Preah Norodom Blvd, Phnom Penh, Kingdom of Cambodia	Tel 855 12 810 330 Fax 855 23 725 938	k_sivorn@yahoo.com SITA: PNHCAYA AFTN: VDPPYAYC
6.	CHINA			
	Mr. Xiao Jing	Deputy Director of Air Traffic Control Division, Air Traffic Management Bureau of CAAC 12# East San-huan Road Middle, Chaoyang District Beijing, 100022, China	Tel: (+86 10) 8778 6812 Fax: (+86 10) 8778 6810	xiaojing@263.net.cn
7.	COOK ISLANDS			
	Mr. Aukino Tairea	Secretary of Transport Ministry of Transport PO Box 61 Rarotonga, Cook Islands	Tel: 682 28810 Fax : 682 28816	transport@oyster.net.ck

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	Name	Title/Organization	TEL/FAX Number	E-mail
8.	DPR KOREA			
	Mr.Kim Ryong Ho	Director, Flight Safety Standard Department GACA Sunan District, Pyongyang, DPR of Korea	Tel 850-2-18111 Ext – 8109 Fax 850-2-3814410 Ext-4625	gaca@silibank.com
9.	FIJI			
	Mr. Robert Y Fong	Controller Ground Safety Civil Aviation of the Fiji Islands Private Mail Bag NAP 0354 Nadi Airport, Nadi Fiji Islands	Tel 679-672-1555 EXT 3371 Fax 679-672-1500	cgs@caaf.org.fj
10.	FRENCH POLYNESIA			
	Mr. Claude Bourcier	Acting Chief , Service de la Navigation Aierenne (SNA) P.O. Box 6011 98702 Faa'a Airport Tahitis French Polynesia	Tel (689) 86 12 73 Fax (689) 86 10 29	mallart_loic@seac.pf
11.	HONG KONG CHINA			
	Mr. Alva Chi-wing FUNG	Senior Operations Officer Hong Kong,China/ Civil Aviation Department 46/F Queensway Government Offices 66 Queensway Hong Kong, China	Tel 852 2867 4214 Fax 852 2877 8542	acwfung@cad.gov.hk

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	Name	Title/Organization	TEL/FAX Number	E-mail
12.	INDIA			
	Mr. Manoj Bokade	Deputy Director of Operations Office of Director General of Civil Aviation, Ministry of Civil Aviation, Government of India, New Delhi 110003	Tel 91-11-24620273, 24610629,24622495 Ext. 428 Fax : 91-11-24633140	N/A
13.	INDONESIA			
	Mr. Ling Iskandar GP	Director of Aviation Safety Directorate General of Civil Aviation JL. MERDEKA BARAT No. 8 Karya Building 23rd floor Jakarta 10110, Indonesia	Tel 62 21 350 7569, 62 21 350 6451 Fax 62 21 350 7669,	atsdivision_ind@yahoo.com
	Mr. M Nasit Usman	Deputy Director of Air Traffic Service	Tel 62 21 350 6451 Fax 62 21 350 7569	atsdivision_ind@yahoo.com
14.	JAPAN			
	Near Collision Report by PIC	Safety and Security Inspector General Japan Civil Aviation Bureau 2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo, 100-8918 Japan	Tel +81-3-5253-8701 Fax +81-3-3580-5233	N/A
	Accident/Serious Report	Flight Standard Division Japan Civil Aviation Bureau 2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo, 100-8918 Japan	Tel +81-3-5253-8731 Fax +81-3-5253-1661	
	ACAS RA Report	Air Traffic Control Division Japan Civil Aviation Bureau 2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo, 100-8918 Japan	Tel +81-3-5253-8749 Fax +81-3-5253-1664	

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15.	KIRIBATI			
16.	LAO PDR			
17.	MACAU, CHINA			
	Chan Weng Hong	President Civil Aviation Authority – Macao, China Alameda Dr. Carlos D' Assumpcao, 336-342 Centro Comercial Cheng Feng, 18 andar Macao	Tel + 853 511 213 Fax + 853 338 089	aacm@aacm.gov.mo
18.	MALAYSIA			
	Accident/Incident Ahmad Nizar Zolfakar	Director ATS Inspectorate DCA Malaysia	Tel 603-8871-4000 Fax 603- ~~8871-4290~~ <u>8881-0530</u>	nizar@dca.gov.my
	Safety related Mr. Chew Lam Leong	Assistance Director, Safety Management Unit Air Traffic Services Division Department of Civil Aviation 4 th floor, podium block B Lot 4G4 Precint 4 Federal Government administrative Centre 62570 Putrajaya, Malaysia	Tel 603-8871-4210 Fax 603- ~~8871-4290~~ <u>8881-0530</u>	chew@atsdca.gov.my chewll@dca.gov.my

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19.	MALDIVES			
	Mr. Ahmed Nazim	Director, Standards Maldives/Civil Aviation Department 7 th Floor P A Complex Hilaalee Magu, Male' Rep of Maldives	Tel (960) 3342984 Fax (960) 3323039	nazim@aviainfo.gov.mv
20.	MARSHALL ISLANDS			
	Mr. Stanley Myazoe	Director, Directorate of Civil Aviation P.O. Box 1114 Majuro, Marshall Islands MH 969690	Tel 011 (692) 625-6179, 455-3330 Fax 011 (692) 625-6170	rmidca@ntamar.net SMS-4553330@cell.ntamar.net
21.	MICRONESIA			
22.	MONGOLIA			
23.	MYANMAR			
	Mr. U YOA SHU	Deputy Director (Air Traffic Services) Department of Civil Aviation Yangon International Airport Airport Road, DCA Headquarter Building Yangon, Myanmar	Tel: 951 665838, 665144, 665637 Fax: 951 665124	dca.myanmar@mptmail.net.mm dca.myanmar@mptmail.net.mm(ATB)

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	Name	Title/Organization	TEL/FAX Number	E-mail
24.	NAURU			
25.	NEPAL			
		Director, ATS Department Civil Aviation Authority of Nepal Head Office, Katmandu	Tel: 977 1 426 2518 Fax: 977 1 426 2326	cnsatm@caanepal.org.np
26.	NEW CALEDONIA			
	Mr. Reuter Numa	Quality and Safety executive manager New Caledonia Civil Aviation BP H1 98849 Noumea Cedex New Caledonia	Tel: 687 26 51 82 Fax: 687 26 52 06	numa.reuter@aviation-eivile.gour.fr ueva.paquier@aviation.eivile.gour.fr
27.	NEW ZEALAND			
	Mr. Peter Davey	Manager, Policy and International Civil aviation Authority of New Zealand 10 Hutt Road Petone P. O. Box 31 441 Lower Hutt New Zealand	Tel: +64 4 560 9400 Fax: +64 4 569 2024	piru@caa.govt.nz

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28.	PAKISTAN			
	Mr. Nusrat Ullah Khan	Director Operations Civil Aviation Authority - Pakistan, HQ Civil Aviation Authority, Terminal 1, Operations Directorate, JIAP Karachi 75200, Pakistan	Tel: 92-21-9248745 Fax: 92-21-9248744	dops@caapakistan.com.pk
29.	PALAU			
	Mr. Cordino Soalablai	Civil Aviation Specialist Koror, Palau/Ministry of Commerce & Trade P.O. Box 1471 Koror, Republic of Palau 96940	Tel: 680 488-2111/587- 21-8881-053015 Fax: 680 488-3207	mincat@palaunet.com c.soalablai@palaunet.com
30.	PAPUA NEW GUINEA			
	Mr. Gabriel Salayau	Assistant Manager ATS Operations (SS&F) Papua New Guinea Civil Aviation Authority P.O. Box 684 Boroko Port Moresby, N.C.D Papua New Guinea	Tel: (675) 324 4643 Fax: (675) 325 0749	gsalayau@caa.com.pg
31.	PHILLIPPINES			
	Capt. Jose R. Saplan	Check Pilot / Chairman, AAIB Air Transportation Office, Philippines Old MIA Road, Pasay City 1301, Philippines	Tel: (632) 8799 225 / 218 Fax: (632) 8799 218	saplan6864@yahoo.com
	Mr. Wilfredo S. Borja	Director, Air Traffic Service Air Transportation Office MIA Road, Pasay City 1300, Philippines	Tel: (632) 8799 161/259 Fax: (632) 8799 259	

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32.	REP. OF KOREA			
	Mr. Choi Hoo Yung Assistant Director, Flight Standards Division	Flight Standards Division Civil Aviation Safety Authority 274 Gwahe-dong Gangseo-gu Seoul Republic of Korea	Fax: 82-2-6342-7249 Tel: 82-2-2662-2169	hooychoi@mact.go.kr
33.	SAMOA			
34.	SOLOMON ISLANDS			
	Mr. George Satu	Principal Flight Standard Officer Solomon Island Civil Aviation Division P.O. Box G8 Honiara, Solomon Islands	Tel: 677 36567/36563 Fax: 677 36220	
35.	SINGAPORE			
	Mr. Heng Cher Sian Edmund	Project Officer (Airspace) Civil Aviation Authority of Singapore P.O. Box 1 Singapore Changi Airport Singapore 918141	Tel: 65-6541-2457 Fax: 65-6545-6516	edmund.heng@caas.gov.sg
	Mr. Dieu Eng Kwee	ATC Manager (Standard) Civil Aviation Authority of Singapore P.O. Box 1 Singapore 91814	Tel (65) 6541 2456 Fax (65) 6545 6516	dieu_eng_kwee@caas.gov.sg

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36.	SRI LANKA			
	Mr. Atula Jayawicjrama	Deputy Director, Aerodromes and Navigation Services Sri Lanka Civil Aviation Authority No. 64, Supreme Building Galle Road Colombo - 3 Sri Lanka	Tel 94-11-243 6324, 077 359 6210 Fax 94-11-244 0231	atulacaa@sitnet.lk
37.	THAILAND			
	Mr Aphinun Vannangkura	Safety Director Aeronautical Radio of Thailand LTD	Tel 662 287 8294 Fax 662 287 8609	aerosafety@aerothai.co.th
	Mr. Vutichai Singhamany	Director of Flight Standards Bureau Department of Civil Aviation Flight Standards Bureau 71 Ngarmduplee. RamaIV Rd. Tung Mahamek, Sathorn Bangkok, 10120	Tel : 662 287 4061 Fax : 662 286 2913	svutichai@aviation.go.th
	Mr. Choochart Mainoy	Air Traffic Services Advisor Airport Standards and Air Navigation Facilitating Division	Tel : 662 286 8159 Fax : 662 286 8159	cmainoy@hotmail.com
38.	TONGA			
	Mr. Viliami Ma'ake	Director of Civil Aviation Ministry of Civil Aviation P.O. Box 845 Salote Road Fasi Ministry of Civil Aviation, Tonga	Tel: + 676-24144 / 23401 Fax: + 676 24145 / 24296	vmaake@mca.gov.to

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	Name	Title/Organization	TEL/FAX Number	E-mail
39.	UNITED STATES			
	En Route and Oceanic Services Mr. Ken Myers	Manager, Quality Assurance and Safety Group (AJE-33) Air Traffic Organization - En Route and Oceanic Services U.S. Federal Aviation Administration (FAA)	Phone: (202) 267-9157	ken.Myers@faa.gov
	Terminal Services Mr. Jesse Gaines	Manager, Terminal Operations (AJT-21) Air Traffic Organization - Terminal Services U.S. Federal Aviation Administration (FAA)	Phone: (202) 385-8778	jesse.Gaines@faa.gov
40.	VANUATU			
	Mr. Max Foon	Assistant Director – Flight Standard Private Mail Bag 9068 Port Vila Republic of Vanuatu	Tel: (678) 22819/23301 Fax: (678) 23783	civav@vanuatu.com.vu
41.	VIET NAM			
	Mr. Bui Van Vo	Director, Air Navigation Department/CAAV 119 Nguyen Son, Long Bien, Ha Noi, Viet Nam	<u>Tel: (84-4) 8274191</u> <u>Fax: (84-4) 8274194</u> <u>AFTN: VVVVYAAN</u>	and@caa.gov.vn
	Mr. Duong Van Thao	Director, Flight Standard Department/CAAV 119 Nguyen Son, Long Bien, Ha Noi, Viet Nam	<u>Tel: (84-4) 8732283</u> <u>Fax: (84-4) 8732291</u> <u>AFTN: VVVVYAYX</u>	thaodv@caa.gov.vn

STATE SAR AGREEMENTS

(last updated 6 July 2007)

ID NO.	DATE	STATES	REMARKS
1	14 April 1972	ASEAN States - Indonesia, Malaysia, Philippines, Singapore and Thailand	Multilateral agreement for the facilitation of search for aircraft in distress and rescue of survivors of aircraft accidents
2	March 1997	Viet Nam - ASEAN	Viet Nam signed instrument of accession to 1972 ASEAN Agreement (as above)
3	June 1982	Indonesia / Singapore	
4	September 1985	Singapore / Thailand	Updated July 1996
5	July 1996	Philippines / Singapore	
6	November 1990	Australia / Indonesia	Updated 5 April 2004
7	February 1999	Cambodia / Viet Nam	
8	9 December 1985	Malaysia / Philippines	
9	9 September 1985	Malaysia / Thailand	
10	11 August 1984	Malaysia / Singapore	
11	29 August 1985	Malaysia / Indonesia	
12	16 December 1998	Malaysia / Brunei Darussalam	
13	February 2001	Australia / Papua New Guinea	
14	September 2002	New Caledonia / New Zealand	
15	November 2002	United States / Republic of Palau	
16	2003	United States / New Zealand	
17	1988	United States / Indonesia	
18	1986	United States / Japan	
19	notified 2003	United States / Marshall Islands	
20	notified 2003	United States / Micronesia	
21	notified 2003	United States / China	
22	1998	Lao PDR / Vietnam	LOA for provision of assistance

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ID NO.	DATE	STATES	REMARKS
23	June 2005	Tonga / New Zealand	
24	August 1986	Indonesia / Philippines	
25	notified July 2006	Indonesia / United States	Agreement on the Coordination of SAR Services
26	1990	Indonesia / Papua New Guinea	JBC MOU signed
27	July 1996	Viet Nam / Singapore	
28	September 1996	Viet Nam / Philippines	
29	notified 2005	New Zealand / Australia	
30	notified 2005	New Zealand / Samoa	
31	April 2006	Australia / Maldives	Letter of Arrangement
32	notified July 2007	New Zealand / Cook Islands,	
33	notified July 2007	New Zealand/Chile	Final draft agreement being considered by authorities in Chile
34	notified July 2007	New Zealand/Niue	No requirement for separate SAR agreement, covered under Government to Government aid agreement
35	notified July 2007	New Zealand/Tahiti French Polynesia	Final draft agreement being considered by authorities in Tahiti
36	notified July 2007	New Zealand/Tokelau	No requirement for separate SAR agreement, covered under Government to Government aid agreement

*updated entries by ATM/AIS/SAR/SG/17 in bold type

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Analysis of SAR Capability of ICAO States in the ASIA/PAC Region

	Training	Alerting	SAR committee	Agreements	Relationships	Communications	Quality Control	Civil/Military	Resources	SAREX	Library	Computerisation	SAR programme	Special equipment	SAR aircraft	Navigation	ELTs	LUT
Australia	E	E	E	E	E	C	E	E	E	E	E	E	E	E	E	E	C	E
Bangladesh	B	C	D	A	A	C	C	A	D	A	A	C	A	A	C	C	D	C
Bhutan																		
Brunei	E	E	E	E	E	E	E	E	E	E	E	E	E	D	D	E	E	A
Cambodia	B	B	B	B	B	B	C	A	B	B	A	C	A	A	A	B	A	A
China	E	E	E	E	E	E	D	D	E	D	D	C	B	A	E	E	E	A
Cook Islands	A	B	B	A	A	C	C	C	B	A	B	A	A	A	A	B	A	A
DPR Korea	B	D	B	D	A	B	D	D	D	C	B	A	A	A	B	A	C	A
Fiji	B	C	C	C	C	C	C	B	D	C	D	C	A	C	B	A	C	A
French Polynesia	C	D	D	D	C	D	E	A	E	C	C	B	A	A	E	D	E	A
Hong Kong, China	E	E	E	E	D	E	E	E	E	E	E	E	E	E	E	E	E	E
India	D	C	C	B	B	C	C	A	C	C	C	C	C	D	D	D	C	E
Indonesia	E	D	E	E	E	D	D	D	E	D	E	D	D	D	C	D	D	E
Japan	E	E	E	E	D	E	E	E	E	E	E	E	D	E	E	E	E	E
Kiribati																		
Lao PDR	B	A	B	B	B	A	B	A	B	B	A	C	A	A	A	A	A	A
Macau, China	E					E	E				E					E		
Malaysia	E	E	C	E	D	E	E	E	E	E	E	D	E	E	E	D	E	B
Maldives	B	A	A	A	A	A	A	A	D	A	C	A	A	A	A	A	A	A
Marshall Islands																		
Micronesia	C	B		A	A	B	C					A		B	B			
Mongolia	A	C	C	A	B	B	B	A	B	B	B	C	B	B	A	A	A	A
Myanmar	B	A	B	C	A	D	C	C	D	A	A	A	A	A	C	A	D	A
Nauru																		
Nepal	D	D	C	B	A	C	C	B	D	B	A	B	A	D	D	C	D	B
New Caledonia	C	D	D	D	C	D	E	A	E	C	C	B	A	A	E	D	E	E
New Zealand	E	E	E	E	A	E	E	E	E	E	E	E	E	E	E	E	E	E
Pakistan	C	C	D	D	A	D	D	C	D	C	A	A	A	A	D	A	D	C
Palau																		
Papua New Guinea	D	E	D	C	D	D	C	C	D	C	C	D	C	C	C	A	A	A
Philippines	D	C	E	D	D	C	D	D	E	C	C	C	C	C	C	B	C	A
Rep. of Korea	C	C	C	C	C	D	E	E	E	E	C	A	D	E	D	E	E	E
Samoa																		
Solomon Islands																		
Singapore	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Sri Lanka	D	A	C	D	B	C	C	D	E	D	B	C	A	A	D	D	C	A
Thailand	E	E	E	E	D	E	E	E	E	E	E	D	D	D	E	E	E	E
Timor Leste																		
Tonga	C	B	A	A	B	C	C	A	D	A	A	A	A	A	A	A	C	A
United States	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Vanuatu																		
Viet Nam	D	D	D	E	D	D	D	C	E	D	C	C	B	C	C	D	D	B
Last updated 6 July 2007																		
Categorisations:																		
A = Not implemented									D = Meets Annex 12 requirements in most areas									
B = Initial implementation									E = Fully meets Annex 12 requirements									
C = Meets Annex 12 requirements in some areas									Blank = No response									

**RECOMMENDATIONS OF THE FEBRUARY 2007 ICAO SAR WORKSHOP
RELATED TO THE WORK OF THE ATM/AIS/SAR/SG**

1. On account of the workshop being as well received as it was and as useful in transferring awareness, knowledge and motivation;

It is recommended that ICAO should conduct such informative SAR building initiatives more regularly.

2. Because particular benefit was derived from the desk top SAR exercise (SAREX);

It is recommended that future SAR seminars and workshops should incorporate either a desk top SAREX or, if funds permit, a live SAREX that facilitates the involvement of all participants and gives a practical context to the SAR learning process.

3. Because the participation of SAR experts from various State administrations gave opportunity for a comparison of procedures, an exchange of views and the emergence of a spirit of camaraderie and enthusiastic enquiry;

It is recommended that future workshops should include presentations from an array of experts from various maritime and aeronautical administrations and civil and military SAR providers.

4. In consideration of the unprecedented growth in air traffic now occurring and forecast to continue throughout the Asia/Pacific region, and recognizing that, counter to popular perception, airline accidents are survived by a very high number of occupants;

It is recommended that more attention be paid to SAR services by the ICAO Asia/Pacific Regional Office.

5. While SAR features on the agenda of some regional planning and procedures groups, it is noted that it is frequently paid little focused attention. This, it is considered, arises out of insufficient representation at such meetings by personnel aware of the need for SAR, its methodologies and its benefits.

It is recommended that arrangements be made for more expert representation of State SAR services at influential Asia/Pacific regional air navigation meetings in order that the important role of SAR services may be better explored and further established.

6. Noting the worth of the SAR matrix and table of SAR agreements developed by the ICAO Asia/Pacific Regional Office whereby the capacity and effectiveness of various aspects of regional States' SAR systems are summarized;

It is recommended that a State Letter be originated requesting that Asia/Pacific States provide timely and accurate data to enable the APANPIRG SAR capability matrix and table of SAR agreements to be more frequently and reliably updated by the ICAO Asia/Pacific Regional Office.

***Note:** Regional Office State Letter Ref.: T3/10.1, T3/14.5 – AP040/07 (ATM), dated 10 May 2007 was subsequently transmitted in this respect*

7. Noting that the free availability to all States of the Cospas-Sarsat satellite alert and location system and the unprecedented benefit that it portends in reducing search times and costs as well as in saving lives, and noting that there are still some States not fully cognizant of its benefits or how to access them, and, further, noting that there is an urgency about making arrangements for processing 406 MHz signals because of the intention of the Cospas-Sarsat Council to terminate satellite monitoring of 121.5 MHz;

It is recommended that a State Letter be originated that draws the attention of Asia/Pacific States to the availability of the C-S system, its benefits, how they may be accessed and the critical importance of States making registration arrangements and nominating a SAR Point of Contact for receipt of alert messages.

Note: Regional Office State Letter Ref.: T 3/11.4 – AP041/07 (ATM), dated 18 May 2007 was subsequently transmitted in this respect

8. It is apparent that if the safety needs of aircraft operations in the region are to be properly respected and acted upon, it will require ICAO to take some further initiative in addressing SAR shortcomings and deficiencies. The evidently insufficient capacity of States to identify their SAR needs (let alone remedy them) is indicative of the need for ICAO to facilitate an effective oversight and corrective role. This would require, in the first instance, an evaluation of Pacific island State SAR systems. (This was the original task set for the 2007 ICAO SIP but was well outside the financial budget ultimately provided.)

It is recommended that a further Pacific SAR SIP or TCB project be arranged of longer duration and more substantial budget that would allow an experienced consultant to evaluate the SAR systems of Pacific island States. Upon completion of the evaluation, a further workshop should be convened at which organizational strategies should be discussed with a view to advancing a plan for more effective regional SAR service provision through an increased sharing of resources, taking greater advantage of global SAR facilities and consolidating aspects of the system to strengthen weak links.

The agenda of the workshop should also include the development of an action plan for a more effective Preventive SAR programme for the mitigation of risk, the minimization of SAR actions and the reduced impact of SAR events when they do occur. The concept of regional SAR provision is considered to be the only feasible means whereby all Pacific island Contracting States may comply with the Annex 12 provisions, including the primary requirement to establish and maintain an effective SAR system 24/7. It is considered that facilitation of regional SAR services across State borders can only be catalysed by a credible, authoritative international organization. ICAO is the most suitable contender.

9. In recognition of the inevitable reduction in the number of SRRs throughout the region over ensuing years (or, at least, in the number of providers servicing these areas);

It is recommended that ICAO take a lead role in educating States in the continuing extent of economic pressure likely to be applied by international airlines for the reduction of air navigation charges and the necessarily rationalized areas in which SAR services will be provided as a result.

— End —

**AGENDA ITEM 4: CONSIDER PROBLEMS AND
MAKE SPECIFIC
RECOMMENDATIONS
CONCERNING THE PROVISION
OF ATM/AIS/SAR IN THE
ASIS/PACIFIC REGION**

Agenda Item 4: Consider problems and make specific recommendations concerning the provision of ATM/AIS/SAR in the Asia/Pacific Region

Variations in True Airspeed

4.1 The meeting was informed by the United States that the ISPACG/21 and the IPACG/26 had in-depth discussions regarding the rule set forth in Annex 2, paragraph 3.6.2.2 b, which requires air traffic control (ATC) to be notified when the average true airspeed at cruising level between reporting points varies or is expected to vary from that given in the flight plan by plus or minus 5 per cent of the true airspeed. At both IPACG and ISPACG meetings, it was evident that there was a general lack of a common understanding as to what the expression “inadvertent changes” means in Annex 2, paragraph 3.6.2.2. Both groups agreed that a common understanding is critical in today’s operating environment where reduced separation standards are being implemented and that clarification is needed as to the true intent of this section of Annex 2.

4.2 The meeting thanked the United States for bringing this matter to the attention of the Sub-Group. It was evident from the discussions that there were a number of potential interpretations of the terminology “inadvertent changes” as used in paragraph 3.6.2.2 of Annex 2 and that, in the case of speed variations, the differing interpretations could lead to potentially unsafe outcomes. The meeting agreed that clarification of the intent of paragraph 3.6.2.2 b) of Annex 2 in relation to the 5 per cent parameter was also necessary noting, for example, that a 5 per cent increase from M.80 was approximately M.84 and, conversely, a 5 percent decrease from M.84 was M.80. The meeting sought the assistance of the ICAO Air Navigation Commission in clarifying these matters and drafted the following draft Conclusion:

Draft Conclusion 17/13 – Clarification of intent of Annex 2 in relation to variations in true airspeed

That, noting the importance of full ATC awareness of actual aircraft speed differentials in the application of reduced longitudinal separation and that a 5 percent variation in speed meant the difference between M.080 and M.084, ICAO be invited to:

- a) clarify the intent of paragraph 3.6.2.2 of Annex 2 – *Rules of the Air* in relation to the terminology “inadvertent changes”; and
- b) review the 5 percent parameter as applicable to variations in true airspeed described in paragraph 3.6.2.2 b) of Annex 2 to establish whether this parameter should be reduced in areas where reduced longitudinal separation standards were being applied.

Intergovernmental Panel on Climate Change

4.3 IATA updated the meeting in respect to the Special Report on Aviation and the Global Atmosphere that had been released by the United Nations Intergovernmental Panel on Climate Change (IPCC) during 2001. The report stated that improvements in air traffic management (ATM) and other operational procedures could reduce aviation fuel burn by between 8 and 18%. The large majority (6 to 12%) of these reductions would come from ATM improvements as all engine emissions will be reduced as a consequence.

4.4 The IPCC Report noted that the rate of introduction of improved ATM would depend on the implementation of the essential institutional arrangements at an international level. Existing national and international ATM systems had limitations which resulted, for example, in holding, inefficient routings, and sub-optimal flight profiles. These limitations result in excess fuel burn and consequently excess emissions.

4.5 The IPCC Report considered that for the current aircraft fleet and operations, addressing the above-mentioned limitations in air traffic management systems could reduce fuel burned in the range of 6 to 13%. It is anticipated that the improvement needed for these fuel burn reductions will be fully implemented in the next 20 years, provided that the necessary institutional and regulatory arrangements have been put in place in time.

Implementation of a Safety Management System (SMS) for ATS in Japan

4.6 Japan presented the meeting with a summary of progress and plans concerning the implementation of a safety management system (SMS) for ATS in Japan. Japan reviewed the ATS safety management mechanism in JCAB in early 2005 in light of the relevant requirements set in Annex 11 – *Air Traffic Services*, and recognized the need to restructure the present mechanism to pursue a more proactive approach to manage ATS safety.

4.7 The meeting noted that in order to facilitate the implementation of SMS, JCAB had developed essential safety management related documents, and established a project team within the JCAB headquarters and a new management post “Counselor for Air Traffic Policy” overseeing the development, planning and implementation of the ATS Safety Program in April 2007. Japan had translated the ICAO *Safety Management Manual* (Doc 9859) into Japanese in April 2006 and had actively participated in safety management training courses, seminars and workshops as part of restructuring efforts.

4.8 Japan also informed the meeting that in parallel to the ATS SMS implementation, the SMS for airport operations required in Annex 14 had also been in progress focusing on airport operations, and collaborative nature between airport management and the airport ATS.

4.9 Japan’s ATS SMS would be implemented in a phased manner as follows:

- 1st quarter of 2008 – four area control centers in Sapporo, Tokyo, Fukuoka and Naha;
- 4th quarter of 2008 – international airports published in AIP Japan; and
- 2009 – the rest of airports and ATS facilities.

Traffic Movements and GNE Reports in the South China Sea

4.10 Singapore provided the meeting with the traffic movements and gross navigation error (GNE) reports from July 2006 to May 2007 in accordance with an Operational Letter of Agreement signed in 2001 for the Monitoring of Aircraft Navigation Errors in the South China Sea. The meeting recognized that currently, Singapore was the Monitoring Authority responsible for collating relevant data concerning flight operations along the designated RNAV routes in the South China Sea area. Their responsibilities included defining agreed procedures for the monitoring, notification, investigation, analysis and reporting of aircraft navigation errors in respect of aircraft to which the 60 NM lateral separation standard and a 10 minute or 80 NM RNAV longitudinal separation minima was applied. The members involved were China, Hong Kong China, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

4.11 The meeting was informed that Hong Kong China, Philippines and Singapore would be responsible for the gathering and forwarding of traffic movements including the Navigation Error data on the designated areas. However, in assessing the navigation errors on the six RNAV routes, there were four appropriate areas for which the required monitoring may be undertaken, given the extensive ground-based navigation aid coverage in the South China Sea, as follows:

- a) DULOP and DUMOL on M771;
- b) AKOTA and AVMUP on L625;
- c) LULBU and LEGED on N884; and
- d) MELAS and MABLI on N892.

4.12 The meeting noted that GNE reports relating to areas other than those stated above should also be processed and reported in accordance with the Letter of Agreement.

4.13 Singapore expressed their appreciation to MAAR for the contribution in conducting the safety assessment of the South China Sea parallel routes in accordance with APANPIRG Conclusion 17/6 – as discussed in Agenda Item 6. The meeting noted Singapore's willingness to contribute to the region by continuing its role as the Monitoring Authority to collect and collate the statistics as well as sending the reports to MAAR for analysis and safety monitoring.

4.14 Singapore informed the meeting that in order to facilitate the implementation of RNP 10 based separations, i.e. 50 NM/50 NM, Singapore was prepared to monitor the GNE on the remaining two parallel routes in the Singapore FIR, if so required, on the appropriate route segments. This was essential to enable any further horizontal safety assessments to be structured to assess RNP10 (50NM/50NM) operations as it was anticipated that this necessary step to RNP10 configuration would be taken in the foreseeable future.

4.15 The meeting thanked Singapore and agreed to this initiative. The collection of the additional data would be valuable to the periodic conduct of the horizontal safety assessment. The Secretariat highlighted that this change would require an amendment to the existing Letter of Agreement (LOA) for data collection amongst the many States involved and requested that the new LOA be drafted and implemented as soon as possible. Singapore would prepare and circulate a draft LOA to this effect.

4.16 The Secretariat noted that implementation of 50NM lateral and longitudinal separation was imperative in the short term to manage the increasing traffic levels in this area, and that implementation of 30NM/30NM separation should be considered as the medium term goal. In this context, the Secretariat urged that the LOA be re-written in such a way that, as well as 50NM longitudinal separation, consideration was given to providing data that would enable a horizontal safety assessment to be conducted for routes separated by 50NM horizontally in the near term and for eventual implementation of 30NM lateral route spacing. Incorporating these amendments to the LOA now would mean that suitable data was available in the future as required.

Review of the Asia and Pacific ATS Route Catalogue

4.17 The meeting noted that the *Asia/Pacific ATS Route Catalogue* Version 1 was published in August 2005 and Version 3 was now available from the ICAO Asia and Pacific Office web site (<http://www.icao.int/apac/>) under the menu “eDocuments”. On-going updates had been undertaken by the Regional Office based on the information made available by States and airspace users.

4.18 The Secretariat encouraged all States and international organisations to review the ATS Route Catalogue regularly in accordance with APANPIRG Conclusion 16/10, take action on the route requests in the Catalogue and provide updated information to the Regional Office regularly for inclusion in the Catalogue.

IATA’s Review of the Asia/Pacific ATS Route Catalogue

4.19 IATA recalled that the Route Catalogue was developed by the ATS Route Network Review (ARNR) Task Force. It was to be used as a supplement to the Asia/Pacific Basic Air Navigation Plan and as an aid to States and users for guidance to route development.

4.20 IATA informed the meeting that the Route Catalogue was the result of the excellent work of the ARNR Task Force. The intent was that the routes in Chapters 2, 4 and 5 would be processed in due course and implemented where feasible.

4.21 To date, 14 routes in Chapter 5 of the Route Catalogue had been implemented. IATA wished to place on record its appreciation to all States and the Regional Office for their respective roles in the route planning and implementation. In particular IATA wished to thank China and Vietnam, for their consideration to implement the route between DANANG and SANYA which could potentially save more than 730 NM.

4.22 The Bay of Bengal States such as India, Malaysia, Myanmar and Thailand were also to be applauded for their efforts in establishing four bypass routes between Hat Yai (HTY) and Ranong (RAN), Penang (VPG) and GIVAL, GIVAL and IBANI, and between Kota Bharu (VKB) and Ranong (RAN) in conjunction with the ATFM implementation, which had improved the flow of traffic in the evening peak over the Bay of Bengal and the Kabul FIR. India and Pakistan were also thanked for their ongoing efforts to connect BUTOP to JHANG, which would save up to 50 NM.

4.23 IATA hoped that all the route proposals in Chapter 5 would be given due consideration and expeditiously implemented. However, in consideration that there might be a wide range of difficulties in implementing some of the routes, it was requested that the meeting consider assigning a priority to implementation of the routes and agree that States would continue to process the implementation of the route proposals on an ongoing basis in accordance with the guidelines in the ATS Planning Manual.

4.24 The meeting noted the information provided by IATA, commended States for their efforts to implement route improvements in their respective FIRs, and encouraged them to continue to implement the ATS routes contained in Chapter 5 of the Route Catalogue. In recognizing the complexity of assigning appropriate priorities and noting the good progress that had been made recently in terms of regional route implementations, the meeting, with the agreement of IATA, elected to defer the matter of prioritization of requests to a future work programme.

ICAO Language Proficiency Requirements

4.25 The meeting was informed of the APANPIRG/17 review of the outcomes of the ICAO language proficiency survey in November 2005 and the action agreed to by the Air Navigation Commission. The meeting also noted that the Commission had considered that the results of the survey to be inconclusive, and subsequently ICAO issued the State letter AN 12/44–06/90, dated 27 October 2006, which included a second questionnaire. The Commission has reviewed the results of the new survey, and details of this information can be obtained from the Regional Office.

Second ICAO Aviation Language Symposium (IALS/2)

4.26 The meeting noted information on the Second ICAO Aviation Language Symposium (IALS/2, May 2007) held in Montréal, Canada. IALS/2 was held in follow-up to the First ICAO Aviation Language Symposium (IALS/1, September 2004). Since then, the civil aviation community has pursued the implementation of the ICAO language proficiency requirements. The language training and testing community has developed a wide range of training and testing solutions. In view of the applicability date of the new language proficiency requirements of 5 March 2008 in Annex 1 – *Personnel Licensing*, the Symposium considered that it was timely to draw on lessons learned and to establish an implementation plan for what remains to be done. The Symposium activities, including the working papers, presentations, as well as reports can be found at <http://www.icao.int/icao/en/anb/meetings/ials2/index.html>.

4.27 In order to assist States in meeting the implementation date, a checklist compiled by the Symposium to assist in establishing an implementation plan is provided at **Appendix A** to the Report on Agenda Item 4. The protocol questions used by the ICAO USOAP audit in relation to Language Proficiency have been included as **Appendix B** to the Report on Agenda Item 4.

Implementation of ICAO Language Proficiency Requirements for Air Traffic Controllers and Aeronautical Station Operators in Japan

4.28 Japan informed the meeting that at present, JCAB had not come across any major difficulties in the development, assessment and administration of the language proficiency testing for air traffic controllers and aeronautical station operators which was based on *the Manual on the Implementation of ICAO Language Proficiency Requirements* (Doc. 9835) and Rated Speech Samples CD-ROM.

4.29 In 2006, JCAB established a committee consisting of English specialists, pilots and controllers to assess the language proficiency testing for approximately 1,800 air traffic controllers and 600 aeronautical station operators, and the qualifications of tests and examiners. Accordingly, JCAB had developed the Language Proficiency Testing for air traffic controllers and aeronautical station operators in cooperation with private organizations, and the work was completed in March 2007.

4.30 The meeting noted the good results achieved by Japan in meeting the ICAO language proficiency requirements contained in Annex 1.

Review of the Recommendations of the 43rd Conference of Directors General of Civil Aviation Asia and Pacific Regions

4.31 The meeting was informed of the outcomes of the 43rd Conference of Directors General of Civil Aviation, Asia and Pacific Regions (DGCA/43, December 2006) held at Bali, Indonesia. It was attended by 197 delegates from 33 States/Administrations and 5 international organizations.

4.32 The meeting reviewed the action items agreed to by the DGCA/43 relating to the work programme of the Sub-Group in the fields of ATM/AIS/SAR as follows:

Action Item 43/1	Resolution of Deficiencies;
Action Item 43/2	Safety Management Systems (SMS);
Action Item 43/4	Funding of Safety Monitoring;
Action Item 43/5	Language Proficiency; and
Action Item 43/12	Management of Aviation's Environmental Impacts.

4.33 The meeting agreed that Items 43/1, 43/2 and 43/4 were already covered by the work of the Sub-Group and APANPIRG. The meeting supported the initiatives in Items 43/5 and 43/12 and urged States to review and comply with the Recommendations of the 43rd DGCA's Conference.

Update on ADS-B Task Force developments

4.34 The meeting noted information that the Automatic Dependent Surveillance – Broadcast (ADS-B) Seminar and the Sixth Meeting of ADS-B Study and Implementation Task Force (ADS-B SITF/6, April 2007) were held in Seoul, Republic of Korea.

4.35 The objective of the ADS-B Seminar was to provide information to the participants on ADS-B planning and implementation. The Seminar covered a comprehensive list of topics on the ADS-B.

4.36 ADS-B SITF/6 completed tasks in accordance with the new Terms of Reference adopted by APANPIRG/17, as follows:

- a) prepared draft guidance material on comparison of the various surveillance technologies;
- b) drafted the second amendment to the ADS-B Implementation and Operations Guidance Document (AIGD);
- c) prepared the concept of use for Multilateration; and
- d) agreed proposed guidelines of performance parameters for using ADS-B managed services.

4.37 The meeting recognized that of significance was a proposal for States to consider the benefits of a mandate for aircraft to be equipped with ADS-B OUT. The proposal had also been strongly supported by IATA at the ADS-B SITF/6. Based on the discussion and considerations on mandating the ADS-B OUT, the ADS-B SITF/6 formulated a draft Conclusion for consideration by APANPIRG/18.

4.38 The meeting reviewed the draft Conclusion formulated by ADS-B SITF/6 but was of view that clearer wording to the implementation requirement would be more understandable. Based on the discussions and considerations at the meeting, the following draft Conclusion was suggested for consideration by the 11th Meeting of the CNS/MET Sub-Group (16-20 July 2007) and APANPIRG/18:

Draft Conclusion 17/14 – Mandate Regional ADS-B Out implementation

That, States implement requirements for ADS-B Out avionics equipage in the near term to enable ATC separation services using ADS-B.

Note: The implementation would require aircraft equipped with avionics compliant with either

a) *Version 1 ES as specified in Chapter 3 of draft Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260A)*

or

b) *Version 0 ES as specified in Annex 10, Volume IV, Chapter 3, Paragraph 3.1.2.8.6 (up to and including Amendment 82 to Annex 10) and Chapter 2 of draft Technical Provisions for Mode S Services and Extended Squitter (ICAO Doc 9871) (Equivalent to DO260) to be used till at least 2020.*

Outcomes of the Inaugural Asia Pacific Air Navigation Service Provider Conference

4.39 The meeting was presented by Australia with the outcomes of the First Asia Pacific Air Navigation Service Provider Conference (ANSP Conference /1, August 2006) held at the Gold Coast, Australia and the establishment of consequent meetings as the result of this meeting.

4.40 In August 2006 Airservices Australia initiated an inaugural meeting of Asia and Pacific Regional Air Navigation Service Providers designed to promote practical cooperation between regional ANSPs and airlines with the objective of improving regional service and safety. The ANSP Conference was aiming to complement the work of the Regional Office and APANPIRG.

4.41 The Conference established two working groups to further the process of improved regional cooperation and coordination initiated by the Conference. The two working groups would focus on: smooth transitions across flight boundaries - 'seamless airspace'; and the creation of a regional safety road map to underpin the Global Aviation Safety Roadmap endorsed by ICAO.

4.42 The first meeting of the Global Aviation Safety Roadmap Working Group (December 2006, Bali) discussed the history of the "Global Aviation Safety Roadmap" developed by the aviation industry through an Industry Safety Strategy Group (ISSG) at the request of ICAO. The Working Group agreed that a pilot project be undertaken by Airservices Australia supported by other interested air navigation service providers (ANSPs), with the aim of adopting the Roadmap guidance and disseminating the results regionally.

4.43 The second group formed from the ANSP Conference was the Seamless Airspace Working Group (SAWG). The first meeting of this group (May 2007, Bangkok) was hosted by AEROTHAI. The SAWG work was intended to complement the efforts already commenced by ICAO, IATA and other industry groups in the region.

4.44 The meeting thanked Australia for the presentation on behalf of the ANSP Conference. Discussion ensued as to the role of the ANSP Conference, with the meeting raising concerns at the potential for overlap between these new groups and the existing groups in the region. IATA highlighted a number of recent examples of where there was clear overlap in work programmes and requested the facilitators of the ANSP Conference and its associated workgroups to take care in this regard.

4.45 The meeting agreed that it was imperative that each dollar available to civil aviation be very carefully spent and the avoidance of duplications of effort was a cornerstone in this regard. Additionally, as the second ANSP Conference had clashed with the ATM/AIS/SAR/SG/17 meeting this week and State resources, in many cases, did not stretch to fielding candidates for both meetings, and States had been obliged to choose between meetings.

Civil/Military Cooperation - Thailand

4.46 Thailand informed SAWG/1 that, in an endeavor to strengthen seamless airspace for all aircraft between civil and military authorities in Thailand, a positive and robust system has been created between both authorities and also including the Department of Civil Aviation to assist coordination and decision making arrangements between all concerned.

4.47 During the Civil/Military Air Traffic Management Coordination (CMAC) Summit 2007, which was held in Bangkok, Thailand from 27 February to 2 March 2007, both AEROTHAI and the Royal Thai Air Force (RTAF) gained a clearer concept of civil/military coordination procedures which could be implemented between both parties.

4.48 As a result of this Summit, the Memorandum of Understanding between AEROTHAI and RTAF was reviewed and updated in accordance with the Asia/Pacific Regional Civil/Military Cooperation Guidelines [ASIA/PAC FASID (ICAO Doc 9673, 2001), APPENDIX A to PART V.III AIRSPACE MANAGEMENT]

4.49 Other goals agreed to by AEROTHAI and RTAF were:

- a) Draft of the National Airspace System Master Plan (including airspace strategy and policy) by end of 2007;
- b) Establishment of an Airspace Management Cell at the new Operations Building at AEROTHAI HQ;
- c) Update Airspace Management policies, tools and operational procedures at all levels; and
- d) Minimize segregated airspace in the Bangkok FIR (P, R and D areas)

4.50 The ultimate goal is to continue to move towards flexible and dynamic airspace within the Bangkok FIR.

RNAV implementation in Japan

4.51 Japan reported to the meeting that JCAB would implement new RNAV1 SIDs and STARs at 20 major airports in 2007-2010, and at local airports in 2011-2012. Consequently, RNAV operations would be available at major city pairs in Japan from departure to arrival by 2010, and be available at most of the airports by 2012. RNAV routes currently being promulgated in AIP-Japan will require RNAV5 operational approvals from early 2008. New RNAV5 routes will be added within the next few years.

4.52 JCAB has also decided to make an evolutionary implementation of RNAV (GNSS) approaches with Baro-VNAV, and implement RNP AR (authorization required) approaches at airports where beneficial. RNP AR approaches will increase flight service rate (runway access) and safety, and reduce noise. RNAV1 SIDs and STARs will be promulgated in AIP-Japan on 8 July 2007 with effective from 27 September 2007.

IATA IFBP Procedure – Yangon FIR

4.53 IATA advised the meeting that the IATA In-Flight Broadcasting Procedures (IFBP) requiring pilots to transmit their position regularly on 128.95 MHz while transiting the Yangon FIR have been in force since 29 August 2003. IATA wished to withdraw the procedure if it could be confirmed that the air-ground communications were at the level which would ensure regular and continuous communications between aircraft and air traffic services. However, to date all the indications were that the air-ground communications were still sub-standard. As little is known as to why the long-standing issue could not be resolved, IATA requested the Regional Office to consider mounting a mission to:

- a) undertake a comprehensive study of the situation in order to understand the issues giving rise to the problem; and
- b) propose interim measures and long-term sustainable solutions to assist the State concerned to provide a regular and effective communications service.

4.54 The meeting recalled that the issue of inadequate air-ground communications being provided by Myanmar had been the subject of many missions conducted by ICAO in recent times, and the problems were well known and documented. Also, APANPIRG had also considered the matter, and as a result, the Myanmar authorities have been formally informed of the issues and concerns arising and have been urged on a number of occasions to rectify these problems.

4.55 Myanmar provided an update to the meeting, highlighting the many technical activities, installation of enhanced equipment and surveys that been completed in attempts to address these problems. Myanmar was disappointed that the recent surveys by IATA, although identifying some improvement, were still highlighting that problems existed.

4.56 The meeting noted that most of the recent missions to Myanmar had consisted predominantly of CNS experts. The meeting considered that the next step in assisting all parties to gain a deeper understanding of the reasons behind these persistent communication difficulties should be for the ICAO Regional Office to lead a small mission comprising one ICAO ATM officer and one IATA ATM officer to visit Yangon in order to review the ATS operations in company with ATC experts from Myanmar. Myanmar and IATA agreed to this proposal and the Regional Office would coordinate the mission arrangements later in 2007.

IATA's Review of RNP10 Operations on L642 and M771

4.57 IATA informed the meeting that the introduction of the new South China Sea Route Structure in November 2001, coupled with the introduction of RVSM in February 2002 brought timely relief to a very crowded and inefficient airspace at a time when the traffic was experiencing double-digit growth. However, it was recently highlighted by Singapore that two of the routes i.e., L642 and M771 serving the Kuala Lumpur/Singapore and Hong Kong city pairs were beginning to experience congestion on account of a 40 % traffic increase from 2001 to 2005.

4.58 The first meeting of the South China Sea RNP Implementation Task Force (March 2006, Singapore) agreed among other things, that it would work towards the implementation of RNP10 operations on L642 and M771 as a first step. However, there had been no further progress. While IATA saw the issue as being larger than the two routes where capacity issues were emerging, it nevertheless urged the meeting to consider asking Singapore to convene a special coordination meeting as soon as possible, among the concerned States, in order to progress at least the application of RNP10 separation on L642 and M771, as an initial step.

4.59 The meeting recalled that, as a result of the Regional Office being unable to assist with this matter because of resource limitations, Singapore had agreed to take primary carriage of this task force. The task force would operate with minimal resources from the Regional Office and report to ICAO through the South-East Asia ATS Coordination Group (SEACG).

4.60 Singapore agreed that they would take action to hold the Special Coordination Meeting involving China, Hong Kong China, Singapore, Viet Nam, ICAO and IATA on RNP10 operations on L642 and M771 before the end of 2007 and the second RNP-SEA/TF in Singapore in the foreseeable future. The meeting thanked Singapore for their willingness to assist in these matters and affected States, ICAO and IATA would look forward to participating in the SCM and Task Force meetings.

Unmanned Aircraft Systems

4.61 The meeting was provided information on a progress report on work in relation to Unmanned Aircraft Systems (UAS), previously referred to as Unmanned Aerial Vehicles (UAV) or similar, and the establishment of an ICAO Study Group to assist the Secretariat in coordinating work to address UAS issues.

4.62 The meeting was informed that the first UAV meeting (May 2006, Montreal) had reviewed the results of a questionnaire sent out by ICAO to selected States and international organizations, and the current status of ICAO work concerning UAVs. Consequently, the UAV meeting identified the following critical issues related to UAV activity that had to be addressed and resolved: certification, licensing, regulations, technical issues, human factors issues, public acceptance, environment, and security.

4.63 The UAV meeting agreed that ICAO should coordinate the development of a strategic document that would guide the regulatory evolution and that, even though non-binding, would be used as the basis for development of regulations by the various organizations and States. The UAV meeting agreed to form the *Informal ICAO Working Group on UAVs* to continue work in this regard.

4.64 Upon reviewing the reports of the Informal Working Group, APANPIRG/17 (August 2006) considered that the intent of APANPIRG Conclusion 16/61 requiring ICAO to urgently develop UAS procedures had not yet been met and requested that mechanisms be put in place to ensure that affected States of the region were kept fully informed of progress in these matters and were given opportunity to provide input to discussions. In this context, APANPIRG/17 adopted Conclusion 17/9

as shown below. To facilitate this initiative, contact details for “UAV experts” from a number of Asia/Pacific States were included in the ICAO headquarters’ address list for these matters.

Conclusion 17/9 – Coordination of UAV Procedures Development

That, noting the serious concerns held by some States of the Asia/Pacific Region in respect of Unmanned Aerial Vehicle (UAV) operations in mixed environments, ICAO invite Australia, India, Japan, Malaysia, New Zealand and Singapore to participate in the Informal ICAO Working Group on UAVs.

4.65 Subsequently, during January 2007, a second meeting of the *Informal ICAO Working Group on UAVs* was held.

4.66 The meeting noted the outcomes of the proposal that an ICAO Study Group be formed to assist the Secretariat in developing a framework for regulatory development, in guiding the SARPs development process within ICAO and to support the safe integration of UAVs into non-segregated airspace. The establishment of such a study group was endorsed by the ANC.

4.67 Also of significance from the work of the second meeting of the *Informal ICAO Working Group on UAVs* was the recommendation that the terminology **Unmanned Aircraft Systems (UAS)** be adopted for global use, in line with existing RTCA and EUROCAE language.

4.68 Recognizing that the convening of an ICAO study group to assist the Secretariat would enable the preparation and oversight of suitable UAS procedures, the meeting considered that the intent of Conclusions 16/61 and 17/9 would be adequately addressed by the study group and ICAO HQ Secretariat and recommended to APANPIRG/18 that these two Conclusions be considered as “Closed”. The meeting also recommended that APANPIRG adopt the terminology Unmanned Aircraft Systems (UAS) for regional use when referring to these matters.

Second ICAO Aviation Language Symposium
7 to 9 May 2007

IMPLEMENTATION CHECKLIST

Dear Symposium Participant,

ICAO has developed a checklist to assist States, Operators and Air Navigation Service Providers in the implementation of Language Proficiency Requirements. This checklist is adapted from an Implementation Plan presented to the European Air Navigation Planning Group in October 2006. It can be adapted to meet the specific needs of each State, Operator or Air Navigation Service Provider.

Symposium Participants may find it particularly useful before, during and after the event.

Before...

To develop an inventory of what you have achieved thus far in implementing the Language Proficiency Requirements and what remains to be done.

During...

To prompt discussion on particular aspects of the implementation process.

After...

To channel resources more effectively and efficiently in implementing the requirements.

Implementation Steps	Status	Actions taken Provide documented evidence	Date to be completed by	Corrective or further action
<i>Awareness</i>				
Do all pilots, air traffic controllers and aeronautical station operators of my State/organization have information on the ICAO Language Proficiency Requirements?	Completed In Progress Not applicable			
<i>Regulatory Framework</i>				
Has my State adopted or incorporated the ICAO language proficiency requirements into national legislation?	Completed In Progress Not applicable			

Implementation Steps	Status	Actions taken Provide documented evidence	Date to be completed by	Corrective or further action
<i>Annex 1, Paras 1.2.9.1 – 1.2.9.7</i> <i>Annex 6, Part I, Para 3.1.6</i> <i>Annex 10, Volume II,</i> <i>Paras 5.2.1.6.2.1.1;</i> <i>5.2.1.2.1 and 5.2.1.2.2;</i> <i>5.2.1.5.2 – 5.2.1.5.5</i> <i>Annex 11, Paras 2.27.1 and 2.27.2</i>				
Has my State adopted a regular interval of reassessment of Level 4 and Level 5 licence holders? <i>Annex 1, Para 1.2.9.7</i>	Completed In Progress Not applicable			
Has my State established a procedure for the endorsement of licences for language proficiency? <i>Annex 1, Para 5.1.1.2, XIII</i>	Completed In Progress Not applicable			
Coordination				
Has my State/Organization appointed a focal point responsible for coordinating the implementation of language proficiency requirements?	Completed In Progress Not applicable			
Has my State/Organization established a plan for the implementation of language proficiency requirements?	Completed In Progress Not applicable			
Are regular progress reports provided in my State/Organization on the implementation of the language proficiency requirements?	Completed In Progress Not applicable			
Benchmarking Testing				
Has the current language proficiency level of existing licence holders of my State/Organization been assessed in accordance with the ICAO rating scale? <i>Annex 1, Attachment A</i> <i>ICAO Rated Speech Samples CD</i>	Completed In Progress Not applicable			

Implementation Steps	Status	Actions taken Provide documented evidence	Date to be completed by	Corrective or further action
<i>(http://www.icao.int/anb/fls/AUD001/)</i>				
If not, has a method or a test been identified to assess language proficiency of existing licence holders?	Completed In Progress Not applicable			
Has an English language training plan been established for existing licence holders of my State/Organization to achieve ICAO Level 4? <i>Doc 9835 – Chapter 4</i>	Completed In Progress Not applicable			
If yes, has the English Language Training Plan started?	Completed In Progress Not applicable			
<i>Licensing Testing</i>				
Has my State/Organization decided to develop its own licensing test? <i>Doc 9835 – Chapter 6</i> <i>Check list on the Development and Implementation of Testing for Language Proficiency Requirement *</i> <i>Task List and Qualifications for Test Development Management, Design And Administration Teams*</i>	Completed In Progress Not applicable			
If no, has my State/Organization selected a licensing test? <i>Doc 9835 – Chapter 6</i> <i>Check list on the Development and Implementation of Testing for Language Proficiency Requirement*</i> <i>Task List and Qualifications for Test Development Management, Design And Administration Teams*</i>	Completed In Progress Not applicable			
Has my State/Organization started to administer licensing tests?	Completed In Progress Not applicable			

Implementation Steps	Status	Actions taken Provide documented evidence	Date to be completed by	Corrective or further action
Has my State/Organization established a quality assurance process for the administration of licensing tests?	Completed In Progress Not applicable			
Resources				
Has my State/Organization identified and secured language training resources? <i>Doc 9835 – Chapters 4 and 8</i> <i>ICAO Aviation Training Directory</i>	Completed In Progress Not applicable			
Has my State/Organization decided to develop its own licensing test? <i>Check list on the Development and Implementation of Testing for Language Proficiency Requirement*</i> <i>Task List and Qualifications for Test Development Management, Design And Administration Teams*</i>	Completed In Progress Not applicable			
Has my State/Organization identified and secured interlocutor and rater training resources? <i>ICAO Aviation Training Directory</i>	Completed In Progress Not applicable			
Maintenance Programmes				
Has a language training package to maintain language proficiency at level 4 or above been developed?	Completed In Progress Not applicable			

* This document can be accessed at <http://www.icao.int/anb/fls/AUD001/>

ATM/AIS/SAR/SG/17
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	PEL 3.650 – Language proficiency requirements			
STD & RP A1 1.2.9	PEL 3.651 Has the State established requirements for aviation personnel to demonstrate their ability to speak and understand the language used for radiotelephony communications?	☐ Yes ☐ No	➤ Verify that requirements have been established for the following, as applicable: 1. Helicopter and aeroplane pilots 2. Flight navigators required to use the radiotelephone aboard an aircraft 3. Air traffic controllers 4. Aeronautical station operators 5. Flight engineers 6. Glider pilots 7. Free balloon pilots	☐ Satisfactory ☐ Not satisfactory ☐ Not applicable
STD A1 1.2.9	PEL 3.653 Has the State established a plan to implement relevant ICAO provisions to ensure that licence holders would demonstrate their ability to speak and understand the language used for radiotelephony communications at the level required for their licence?	☐ Yes ☐ No	➤ Plan for the implementation ➤ Critical dates of implementation	☐ Satisfactory ☐ Not satisfactory ☐ Not applicable
GM Doc 9835	PEL 3.655 Has the State established a system for formally evaluating the ability of aeroplane and helicopter pilots, flight navigators required to use the radiotelephone, air traffic controllers and aeronautical station operators to speak and understand the language used for radiotelephony communications at the level specified in the Appendix to Annex 1?	☐ Yes ☐ No	➤ Description and references of the system established including relevant requirements and procedures, and licensing authority funding and resources provided for the evaluation	☐ Satisfactory ☐ Not satisfactory ☐ Not applicable

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	PEL 3.650 – Language proficiency requirements			
GM Doc 9835	PEL 3.657 Has the State established a system for formally re-evaluating the ability of those aeroplane and helicopter pilots, flight navigators required to use the radiotelephone, air traffic controllers and aeronautical station operators, who demonstrate proficiency below the Expert Level (Level 6), at intervals in accordance with an individual's demonstrated proficiency level?	☐ Yes ☐ No	➤ Description and references of the system established including relevant requirements and procedures, and licensing authority funding and resources provided for the evaluation	☐ Satisfactory ☐ Not satisfactory ☐ Not applicable

**AGENDA ITEM 5: REVIEW OF ATS COORDINATION
GROUP MEETINGS**

Agenda Item 5: Review of ATS coordination group meetings

Update on activities of ATS Coordination Groups in the Asia/Pacific Region

5.1 The meeting was updated on the activities since the ATS/AIS/SAR/SG/16 (June 2006) of the ICAO and State ATS Coordination Groups that contribute to the work of APANPIRG. The following sub-regional ATS Coordination Group meetings were held:

ICAO ATS Coordination Groups

- a) 25 – 28 July 2006, ICAO Asia/Pacific Office, Bangkok, Thailand

Combined Seventh Meeting of the FANS Implementation Team, Bay of Bengal (FIT-BOB/7) and the Fourth Meeting of the FANS Implementation Team, South-East Asia (FIT-SEA/4)
- b) 31 July – 3 August 2006, ICAO Asia/Pacific Office, Bangkok, Thailand

Seventh Meeting of the Air Traffic Flow Management Task Force (ATFM/TF/7)
- c) 21 – 24 November 2006, ICAO Asia/Pacific Office, Bangkok, Thailand

Eighth Meeting of the Air Traffic Management Task Force (ATFM/TF/8)
- d) 16 – 19 January 2007, Ho Chi Minh, Viet Nam

Fifth Meeting of the FANS Implementation Team, South-East Asia (FIT-SEA/5)
- e) 22 – 26 January 2007, ICAO Asia/Pacific Office, Bangkok, Thailand

Combined Eighth Meeting of the FANS Implementation Team, Bay of Bengal (FIT-BOB/8), Ninth Meeting of the Air Traffic Management Task Force (ATFM/9) and Seventeenth Meeting of the Bay of Bengal ATS Coordination Group Meeting (BBACG/18)
- f) 29 January – 2 February 2007, Singapore Aviation Academy, Singapore

First Meeting of the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG/1)
- g) 30 April – 3 May, 2007, ICAO Asia/Pacific Office, Bangkok, Thailand

Tenth Meeting of the Air Traffic Management Task Force (ATFM/TF/10)
- h) 2 – 3 May 2007, ICAO European/North Atlantic Office, Paris, France

First Meeting of the Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS/1)

i) 28 May – 1 June 2007, Hanoi, Vietnam

Combined Fourteenth Meeting of the South-East Asia ATS Coordination Group (SEACG/14) and the Sixth Meeting of the FANS Implementation Team, South-East Asia (FIT-SEA/6)

j) 12-15 June 2007, ICAO Asia/Pacific Office, Bangkok, Thailand

Second Meeting of the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG/2)

k) 20 – 21 June 2007, ICAO Asia/Pacific Office, Bangkok, Thailand

Fifth Special ATS Co-ordination Meeting – China, Mongolia, the Russian Federation and IATA (CMRI/5)

State ATS Coordination Groupsa) 23 – 27 October, 2006, Tokyo, Japan

Combined Twenty-fifth Meeting of the Informal Pacific Air Traffic Control (ATC) Coordinating Group and Twelfth Meeting of the FANS Interoperability Team (IPACG 25/FIT 12)

b) 14 – 18 May, 2007, Anchorage, Alaska

Combined Twenty-sixth Meeting of the Informal Pacific Air Traffic Control (ATC) Coordinating Group and Thirteenth Meeting of the FANS Interoperability Team (IPACG 26/FIT 13)

c) 6 – 8 March 2007, Auckland, New Zealand

Twenty-first Meeting of the Informal South Pacific ATS Coordination Group (ISPACG/21)

ICAO ATS Coordination GroupsBBACG/18*Review Current Operations across the Bay of Bengal and Identify Problem Areas*

5.2 BBACG/18 reviewed and noted relevant parts of the reports of the APANPIRG/17, the RASMAG/6, the FIT-BOB/8, and the ATFM/TF/9. Of particular interest were the developments dealing with funding requirements and related activities for safety monitoring in the Asia Pacific Region being addressed by APANPIRG and RASMAG. Also, RASMAG had drawn attention to APANPIRG Conclusion 16/5 requiring States to comply with Annex 11, Chapter 2, safety management provisions for implementing reduced separation minima.

5.3 It was noted that MAAR's RVSM safety assessment showed that the TLS for the Bay of Bengal area continued to satisfy the agreed TLS, and that a standardized approach to the collection of vertical and horizontal traffic sample data had been adopted by APANPIRG.

ATS route developments

5.4 Australia provided information on developments to expand the Australian Organized Track Structure (AUSOTS) to routes to the Middle East and India through the Indonesian, Sri Lankan and Indian airspaces. The States concerned and the Regional Office were supporting implementation as soon as arrangements could be put in place.

5.5 Also, the BBACG/18 noted the benefits of implementing conditional ATS routes and supported the efforts of APANPIRG in this regard.

Development of State Contingency Plans

5.6 BBACG/18 reviewed and supported the outcome of APANPIRG/17 in regard to Conclusion 17/11 that States should adopt the model National ATM Contingency Plan prepared for the Indonesian FIRs through the ICAO SIP, and develop a similar contingency plan in accordance with Annex 11.

Civil Military Coordination

5.7 BBACG/18 was informed of preparations for the Civil and Military Air Traffic Management Summit 2007 (CMAC 2007, February - March 2007) that would be hosted by AEROTHAI in Bangkok, Thailand. CMAC07 was jointly sponsored by the Air Traffic Control Association, the American Association of Airport Executives and the US Department of Defence, with support from the US FAA. CMAC07 was the largest forum of its kind where senior civil and military leaders discuss visions, opportunities and plans for civil/military collaboration to meet the evolving needs of the worldwide aviation community.

5.8 In light of the matters raised in ATFM/TF/9 relating to the need to urgently realign ATS routes to assist with the ATFM operational trial, the BBACG/18 urged India and Pakistan to attend the CMAC 2007.

Review and update of BBACG Task List

5.9 BBACG/18 adopted a new format for the Task List that included alignment to ICAO Strategic Objectives (SO) and Global Plan Initiatives (GPIs), and reviewed, updated and adopted the restructured BBACG Task List.

5.10 BBACG/18 suggested that including the SO and GPI information in the summary at the commencement of each working/information paper to the BBACG would assist in rapidly raising awareness of the new definitions amongst delegates. The Regional Office agreed to institute this practice where appropriate, and sought assistance from States and international organizations in also partaking in this practice.

Interregional ATS Coordination

5.11 In reviewing Item 13 on the Task List, the BBACG/18 noted with disappointment that the limited resources at the Regional Office had led to the deferral of plans for the Regional Office to pursue a periodic 'Whole of Indian Ocean' meeting. This had obliged States, IATA and airspace users to undertake informal activities and had led to the formation of the Informal Indian Ocean ATS Coordination Group (IIOACG) and, more recently, the Arabian Sea Indian Ocean ATS Coordination Group (ASIOACG). It was suggested that this matter should be raised at ATM/AIS/AIS Sub-Group for the attention of APANPIRG.

5.12 Although there had previously been an active ICAO Indian Ocean ATS Coordination Group (IOACG) and the ICAO South West Asia ATS Coordination Group (SWACG) for the Arabian Sea, no current ICAO forum operated in these areas. However, after an abeyance of 10 years, the SWACG meeting was likely to be reactivated under the auspices of the Cairo Office of ICAO and a meeting had tentatively been scheduled for May 2007.

5.13 The meeting was informed that the May 2007 meeting of the SWACG was not held and the convening of the SWACG had been deferred indefinitely.

5.14 The meeting, in recognizing that the work of the ATFM/TF and the FIT-BOB had added additional meeting and resource burdens on those involved in BBACG matters, agreed that the meeting scheduled should be kept to a minimum and where possible, to combine meetings and progress work by correspondence.

5.15 As the ATFM/TF and the FIT-BOB were undertaking major components of the work of the BBACG, the meeting considered that there was not an urgent need for the BBACG to meet during the next 12 months. Accordingly, the Regional Office would schedule the BBACG/19 meeting during January/February 2008 and advise the meeting arrangements in due course.

FIT-BOB/7 and FIT-BOB/8

5.16 The meeting reviewed the reports of the FIT-BOB/7 and FIT-BOB/8, which addressed the matters summarized below.

Review of Bay of Bengal ADS/CPDLC Operational Trial

5.17 The Chennai and Kolkata regions had been participating in the ADS/CPDLC operational trials since 19 February 2004, and were now operating on a 24 hour basis. The system trials at Delhi and Mumbai started in March 2006, and the operational trials commenced from 1 July 2006 after system stabilization and completion of controller training. India had adopted the FANS 1/A Operations Manual (FOM) as the operational procedures applicable for the trial.

5.18 Almost 90 percent of the data link equipped aircraft operating in the Bay of Bengal were logging on to the Chennai ACC services. Data link equipped flights represented about 45 % of the total traffic.

5.19 The problem reports were now mostly repetitive in nature and related mainly to CPDLC connectivity, particularly with certain aircraft types such as A334 and B772 series. However, there was no problem with ADS connectivity.

Review of Arabian Sea ADS/CPDLC Operational Trial

5.20 The data link systems in Mumbai were in operation for almost 17 hours per day. No serious problems had been encountered so far. Very few problem reports had been raised for the Mumbai FIR trial operations. SITA was providing regular updates on unexpected service interruptions as well as planned outage.

5.21 The creation of the Arab Civil Aviation Commission FANS Implementation Group (AFIG) in May 2006 by the Arab Civil Aviation Commission (ACAC)) to oversee the co-ordinated implementation of FANS Services across the Middle East and North African regions stretching would require harmonizing operational aspects of the AFIG and the FIT-BOB ADS/CPCLC implementation plans.

Data link capacity

5.22 Due to Ground Earth Station (GES) capacity limitations, SITA had contributed funding in late 2005 to upgrading of the GES radio channel units, which were the most critical GES component facing obsolescence. To ensure fair competition, it was noted that all data link service provider (DSPs), GESs would need to be equipped with new generation channel units to be able to keep providing services.

5.23 In recognizing the importance of the concerns expressed by SITA concerning the provision of data link services, a table of State ADS/CPDLC implementation planning for all FIT-BOB and FIT-SEA FIRs was prepared, and would be kept up to date to assist the DSPs to provide and plan for future provision of data link facilities and services.

FIT/CRA Funding

5.24 Noting the extensive delay that had occurred in establishing financial arrangements that enabled the provision of CRA services for the Bay of Bengal and Arabian Sea airspaces, India reported that the Government of India had approved funding of the BOB-CRA. Once the formal agreement and other necessary arrangements were completed full implementation of data link services was expected to result.

5.25 The meeting was informed that the arrangements for the CRA had still not been formalised. However, resolution of this matter was anticipated prior to the end of 2007.

BOB-CRA Confidentiality Agreements

5.26 It was recognized that the CRA required access to detailed data link audit data in order to fully investigate and resolve problem reports. The confidentiality agreement documents the rules by which the CRA was allowed access to required information, and that such information would not be used for marketing or other commercial purposes. States and operators participating in the BOB ATS data link trial were invited to sign the confidentiality agreement and send a copy to the FIT-BOB CRA.

5.27 The meeting noted the work and initiatives taken by the FIT-BOB and supported the operational and funding matters to progress the implementation of ICAO regional CNS/ATM Plan to improve the efficiency of operations and enhance safety.

SEACG/14

5.28 The meeting noted the report of the SEACG/14 summarized below

Traffic Sample Data (TSD) State Letter

5.29 SEACG/14 drew the attention of States to the State Letter Ref: T3/10.0, T3/10.1.17 – AP105/06 (ATM) issued in November 2006 concerning continuous monitoring and regular assessment of target levels of safety in reduced separation applications, advising States of a standardized approach to the collection of vertical and horizontal TSD, and emphasizing a number of relevant Conclusions adopted by APANPIRG/16.

Safety assessment for RNP10 Operations in the SCS area

5.30 In follow up to APANPIRG/17 (Conclusion 17/6) .concerning the lack of current horizontal safety assessment for the South China Sea (SCS) route structure, Thailand, recognizing the urgency of the situation, had decided to offer their full commitment in providing appropriate staffing and resources to MAAR in order to satisfy this additional task.

Radar Provision across Southeast Asia Region

5.31 Thailand proposed a harmonized programme to enhance traffic flow in the Southeast Asia region by providing radar handover across boundaries, and proposed to all ANSPs involved to arrange for an operational trial by using consistent radar spacing along the ATS routes A1, P901, M750 and G581.

5.32 SEACG/14 noted the advantages of reducing the spacing on those routes, and was of view that that it was feasible to implement radar spacing along the proposed ATS routes. States were encouraged to carry out bilateral coordination to apply radar spacing and report outcomes to the next meeting. SEACG/14 reviewed and updated the table of the Status of Application of Radar Handover in the Southeast Asia developed at SEACG/13 (May 2006, Bangkok).

ATS Route Development

5.33 SEACG/14 considered the outcomes of APANPIRG/17 in respect to implementation of conditional routes.

5.34 SEACG/14 reviewed the *Asia and Pacific ATS Route Catalogue* Version 4.

5.35 Information was provided by Viet Nam on the establishment and revision of ATS/RNAV routes within the Hanoi and the Ho Chi Minh FIRs.

5.36 Thailand updated the SEACG/14 on progress with the establishment of an ATS route connecting Kota Bharu (VKB) to Ranong (RAN) to support traffic flow during the peak period of Europe-bound flight and changes to RNAV route M752 was changed from the original proposal as referred to in the Route Catalogue, Version 3

Development of State Contingency Plans

5.37 SEACG/14 noted the development of the Indonesia Contingency Plan and that the APANPIRG/17 had endorsed its draft as a model to be used by other States in preparation of a similar national contingency plan in accordance with Annex 11 requirements.

Other matters

5.38 In recognition of the introduction of ICAO Strategic Objectives and the revised Global Plan with associated Global Plan Initiatives (GPIs), the SEACG/14 re-aligned its Action Plan to include these items.

5.39 The next meeting of SEACG/15 would be combined with FIT-SEA/8 in May 2008 at the Asia/Pacific Office, Bangkok, Thailand.

WPAC/SCS RSG/1 & 2

5.40 The meeting reviewed the outcomes of the WPAC/SCS RSG/1 and 2. It was recalled that the WPAC/SCS was formed by APANPIRG/17 (August 2006, Decision 17/5 refers) to urgently address the following matters: the TLS for WPAC/SCS RVSM operations being exceeded and showed an adverse trend; problems with the RVSM interface arrangements between the modified alternate FLOS used in the WPAC/SCS and the single alternate FLOS used in areas surrounding the WPAC/SCS; and the horizontal safety assessment had not been updated in the four and a half years since implementation.

5.41 The WPAC/SCS RSG reviewed and considered issues related to the following matters: safety oversight including safety assessments for RVSM and horizontal separation, non submission of large height deviation (LHD) data, analysis of LHD, ATC coordination issues, pilot issues, FLOS arrangements, and outcomes of RASMAG meetings

5.42 The following significant issues were identified and were being progressed:

- a) as the regional TLS had been exceeded and an adverse trend exhibited, the initial attention and efforts of the WPAC/SCS RSG was heavily focused on reversing this adverse trend, with the objective of returning the safety assessment to compliance with the TLS as soon as possible;
- b) MAAR had identified that the main cause contributable to the RVSM TLS infringement was the significant number of operational errors;
- c) a significant tightening of existing ATC coordination procedures and practices was necessary to ensure that effective coordination was completed, and this was a primary function of ANSPs. Those affected had been urged to take urgent and effective action including ensuring that bi-lateral arrangements were in place to facilitate immediate notification between ACC Supervisors to enable immediate investigation and remediation action;
- d) clarification was sought from RASMAG on what constituted a LHD and to promulgate a user friendly definition of LHD;
- e) the most recent safety assessment by MAAR placed the overall risk estimate at 6.09×10^{-9} fatal accidents per flight hour, thus reversing the adverse trend;
- f) remedial actions taken by States as a result of discussions during the WPAC/SCS RSG/1 meeting were considered to have contributed directly to reversing the negative trend;

- g) concern was expressed at the number of States that had not yet submitted LHD reports to MAAR for the period up to April 2007. Affected States present undertook to rectify any reporting problems, and to make all outstanding data available to MAAR as soon as possible;
- h) any changes that were made to the WPAC/SCS FLOS arrangements would need to be compatible with the FLOS adopted for China's RVSM implementation;
- i) a general agreement was reached on the Scenario 3 FLOS proposal, an ICAO compliant single alternate FLOS with specific high capacity arrangements for the parallel route structure, which combined the best aspects of many of the submissions,
- j) provided that no safety issues were identified with the Scenario 3 FLOS by the safety analyses made by any of the affected States or MAAR, and subject to consensus being reached between States, the Scenario 3 FLOS would be implemented during early 2008;
- k) WPAC/SCS RSG/3 would conduct a comprehensive review of the Scenario 3 FLOS based on State submissions, with a view to making a "Go/No Go" decision in relation to formal implementation; and
- l) the WPAC/SEA RSG/3 meeting would be held from 30 October to 2 November 2007.

5.43 The meeting was pleased to note the positive outcomes of the WPAC/SCS RSG meetings, especially in observing the effective efforts made by the States concerned in addressing the exceedance of the RVSM TLS which had resulted in a dramatic reversal of the adverse trend. Also, the in-principle agreement to the Scenario 3 FLOS proposal was a notable achievement that was expected to lead to an acceptable solution to the RVSM FLOS problems in the WPAC/SCS area.

CMRI/5

5.44 The meeting was provided with information on the main outcomes of the CMRI/5 as summarized below.

China - Expansion of flexible use of Entry/Exit Points on Polar Routes and revision of applicable procedures

5.45 There were currently seven entry/exit points on polar routes in China, comprising four entry/exit points between China and the Russia Federation and three entry/exit points between China and Mongolia. From June 2003, China had adopted a flexible approach allowing airlines to select entry/exit points POLHO, SIMLI and ARGUK, as well as relevant routes for traffic over flying the polar area. From July 5, 2007, China would be expanding the range of flexible choice of entry/exit points by adding MORIT and SADLI. In addition, the *Management Rules of Polar Routes Operations* would replace the existing *Provisional Management Rules of Polar Routes Operations*.

5.46 China indicated that they intended to continue to expand the flexibility of the route arrangements in China over time, and that they would continue to review and enhance the requirements for flight planning.

Mongolia – Enhancing Safety and Increasing Capacity

5.47 Mongolia provided information on the increasing air traffic in their airspace, which was currently growing at a rate of 15 % per year. To meet the growing demand, Mongolia was improving its ATM infrastructure and undertaking a number of projects toward enhancement of safety and increase in airspace capacity. They consider that harmonization of the ATM systems between China, Mongolia, and the Russian Federation is essential and that such harmonization could be achieved through the commonality of equipment and procedures within the region.

5.48 In regard to RVSM implementation planning underway in China and the Russian Federation, Mongolia fully supported implementation of RVSM within its airspace and the need for harmonization with neighbouring FIRs. CMRI/5 commented on the importance of Mongolia implementing RVSM not later than implementation of RVSM in the adjacent airspaces of the Russian Federation, and also consideration should be given to an earlier implementation to match the RVSM arrangements in China.

5.49 Mongolia would be implementing radar services within congested areas in Mongolian airspace during the period of 2007-2009. In this regard, China expressed its wishes for Mongolia to implement the new radars before the 2008 Olympic Games.

Other Operational Matters

5.50 CMRI/5 considered the following additional operational matters: straightening Polar 4 north of SIMLI, which had been subject to preliminary discussions between the Russian Federation and China; airlines had indicated that ADS/CPDLC arrangements at Harbin were working satisfactorily; and streamlining access to provincial areas in China and Mongolia.

5.51 In regard to the establishment of TRASAS, which was supported, concerns were raised at the ability of the TRASAS being at steering group level to effectively engage in operational details of ATM arrangements and the finer detailed work required for ATS implementation. Accordingly, it was agreed that there was an ongoing role for the CMRI in its present format.

5.52 China provided a brief overview of the preparations being made to accommodate the Beijing Olympics in August 2008, highlighting proposed arrangements for increasing traffic capacity. China would provide formal information to affected parties including ICAO and IATA by the end of 2007 or early 2008 and would seek assistance from ICAO and IATA in finalising these arrangements.

5.53 The date and venue for the CMRI/6 would be dependant on progress of work to be accomplished and the outcomes from the next TRASAS meeting which was scheduled in March 2008.

TRASAS/1

5.54 The meeting noted information on the establishment of the Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS), supported by both the NAT SPG and the EANPG /1, to continue work already done concerning the traffic in the Northern (Arctic) area, and to respond to the new requirements for increased efficiency and further developments.

5.55 TRASAS/1 (May 2007, Paris) reviewed work currently underway to enhance the ATS route network, using current and future technologies, and to plan for a transition towards a performance based navigation system.

5.56 TRASAS/1 noted the activities of the following forums: the ICAO Asia/Pacific RVSM/TF/30 (March 2007, Bangkok) concerning RVSM implementation by China; the Cross Polar Trans East Air Traffic Management Work Group (CPWG), which was formed to ensure international cooperation on airspace issues in the subject area; and the Sixth Meeting of the Route Development Group – Eastern Part of the ICAO EUR Region (EDGE/6) in April 2007, which worked on matters related to ATS route planning in the Eastern part of the ICAO EUR Region.

5.57 In respect to traffic growth in the Russian Federation, along the Cross Polar Routes traffic was expected to increase at the level of 40 % annually for the near future. To meet this traffic growth and aircraft operators' requirements, new ATS trunk-routes and feeder-routes were being developed.

5.58 Following the review of the terms of reference of TRASAS (as shown at **Appendix A** to the Report on Agenda Item 5) and the report of TRASAS/1, the meeting agreed that the overall concept that had led to the formation of TRASAS was valid. However, concerns were raised at the ability of the TRASAS to effectively engage in the operational details of the ATM arrangements required. As the TRASAS was at Steering Group level, it appeared that TRASAS would be primarily a policy meeting, rather than an ATS coordination/implementation working group. The extensive membership proposed for the TRASAS was expected to result in large meetings that would perhaps not be conducive to the finer detail work required for ATS implementation.

5.59 The meeting recalled the very effective role played by the CMRI in implementing operational arrangements for the polar operations. As the areas under the responsibility of CMRI moved forward, in terms of sub regional RVSM implementation and the capacity enhancements being pursued by Mongolia for example, it was evident that close coordination between the three States involved would be necessary. The CMRI forum was expected to continue to enable effective working relationships between States at an operational level whilst providing an opportunity for airspace users to directly provide operational input. Accordingly, the meeting agreed that there was an ongoing role for the CMRI in its present format.

5.60 Nonetheless, the meeting supported the continuation of the TRASAS in accordance with the proposed Objectives and Terms of Reference and recommended that APANPIRG engage actively in the TRASAS process. The meeting noted that the next meeting of TRASAS had been tentatively scheduled at the Regional Office in Bangkok, from 18 – 19 March, 2008.

State ATS Coordination Groups

IPACG/FIT Meetings Summary

5.61 The meeting was provided with summaries of the agreements reached at the Twenty-fifth Meeting of the Informal Pacific Air Traffic Control (ATC) Coordinating Group and the Twelfth Meeting of the Future Air Navigation System (FANS) Interoperability Team (IPACG 25/FIT 12, October 2006) that met in Tokyo, Japan and the IPACG 26/FIT 13 (May 2007) that met in Anchorage, United States.

5.62 The FAA and JCAB were now both utilizing the ADS distance-based separation standard of 50 NM for RNP 10 aircraft in the Fukuoka and Oakland FIRs. Anchorage Air Route Traffic Control Center (ARTCC) had begun the process to establish the use of the ADS 50 NM standard within its FIR.

5.63 The FAA and JCAB had had an Air Traffic Service Inter-facility Data Communications (AIDC) system in place for many years. Currently, AIDC transfers were backed up with a voice transfer. The FAA and JCAB agreed on a concept to begin AIDC transfers without voice coordination.

5.64 The FAA and JCAB reached an agreement to expand User Preferred Routes (UPR) trials between Japan and New Zealand/New Caledonia.

5.65 The FAA and JCAB reached an agreement to revise the ATS routes northwest of Guam. The changes are to be effective on August 30, 2007 and are projected to save 220,000 flying miles annually.

5.66 The FAA presented information on its expansion of the 30 NM/30 NM trials in the Oakland FIR. A significant problem with the data link network had now been repaired and the FAA was planning on resuming the use of ADS distance-based separation standards for continued in-trail aircraft separation.

5.67 The FAA reported on Russia Trans East (RTE) airborne trials that were conducted in March of 2007. Thirty-two flights flew the Dynamic Oceanic Tracking System (DOTS) generated tracks. The airborne trials showed an average savings of 6.3 minutes per flight. One flight saved 21 minutes of flying time. The FAA was in the process of expanding the trial to another RTE route and was working to resume the trials.

5.68 JCAB reported that they had commenced a study of a flexible route system between Australia and Japan including evaluation of advantage/disadvantage of UPR.

5.69 Successful implementation of a reduced longitudinal separation minima standard, i.e. 10 minutes, has been achieved in the Oakland Oceanic FIR. Based upon the experience obtained in the Oakland FIR, and upon the successful implementation of FAA's Advanced Technologies and Oceanic Procedures (ATOP) automation system, i.e. Ocean21, at the Anchorage ARTCC, the decision was taken to implement an operational trial of reduced longitudinal separation minima within the Anchorage Oceanic FIR.

ISPACG/FIT Meetings Summary

5.70 The meeting was provided with descriptions of ongoing activities and future plans within the ISPACG as summarized below.

5.71 Blanket approval for implementing Dynamic Airborne Re-routing Procedures (DARP) between the Auckland and Oakland Flight Information Regions (FIRs) had been given and the ISPACG Planning Team was actively working to expand the capability to the Tahiti and Nadi FIRs, as well as implementing it through Brisbane.

5.72 RFE trials had commenced and seen average savings of 16 minutes and 4600 lbs of fuel on 16 flights sampled between Los Angeles and Hong Kong.

5.73 Airways New Zealand had utilized the "Rule of 11" for some years using "radar" as the source to confirm the time interval over the common point but has looked to expand use of the procedure as detailed in ICAO DOC 4444 and 7030 to areas outside radar coverage. On 31st August 2006 the "Rule of 11" expansion was implemented to allow controllers to apply this separation standard between aircraft crossing the same waypoint outside radar coverage.

5.74 The FAA is conducting a concept analysis for an Oceanic In-Trail Climb/Descent Procedures (ITP).

5.75 In light of the reduced longitudinal separation standards currently employed in the South Pacific, Airways New Zealand proposed that the maximum variation that aircrew can employ without advising ATC, be reduced. Following discussions it was obvious that there was a significant difference of understanding when it came to how information was used by operators and ATC. ISPACG/PT2 would take this up and a team would be developed to investigate the documentation and progress the issue report to ISPACG/22. The meeting also asked that ICAO clarify the wording in Annex 2 and to advise whether or not this was a region specific condition and how best to progress any change.

5.76 The meeting was also advised of future plans of ISPACG to include addressing problems with SATCOM and establishing a team to address future work. SEAC Tahiti is tentatively set to host the 22nd meeting of the ISPACG in Tahiti during the week of 10 – 17 March 2008.

**TERMS OF REFERENCE OF THE
TRANS-REGIONAL AIRSPACE AND SUPPORTING ATM SYSTEMS STEERING
GROUP (TRASAS)**

1. Introduction

1.1 In order to continue work already done concerning the traffic in the Northern area and to respond to the new requirements for increased efficiency and further developments, co-ordinated efforts of the international civil aviation community is required. It would involve States and Organisations from five of the ICAO Regions: EUR, ASIA, NAM, NAT and PAC. A Trans-Regional Airspace and Supporting ATM Systems Steering (TRASAS) Group shall respond to these requirements under the following Terms of Reference.

2. Purpose and objectives

2.1 The ICAO Trans-Regional Airspace and Supporting ATM Systems Steering (TRASAS) Group shall co-ordinate the requirements of international civil aviation for a coherent and economically viable and operationally optimal structure of ATS routes, linking city-pairs in Europe and Asia, Europe and North America and Asia and North America. The route network shall have sufficient flexibility to plan different flight paths, day-by-day, to take advantage of prevailing upper winds.

2.2 The Group shall work in close co-operation with aircraft operators' international organisations in order to ensure that known and expected requirements for international and domestic routings and cost-effective implementation are taken into account. The Group will also take account of the requirements for adequate feeder and connection routings to enable optimal access to the route network from points of departure and points of destination, upstream, downstream and from within its vicinity. The scope of the work will respond to the global objectives of the ICAO operational concept and support the new ICAO Global Air Navigation Plan Initiatives: GPI-1 (flexible use of airspace), GPI-2 (reduced vertical separation minima), GPI-3 (harmonised level system), GPI-5 (performance-based navigation), GPI-6 (air traffic flow management), GPI-7 (dynamic and flexible ATS route management), GPI-8 (collaborative airspace design and management), GPI-17 (implementation of data-link applications), GPI-20 (WGS-84 implementation), GPI-21 (navigation systems) and GPI-22 (communication network infrastructure).

3. Scope of work

3.1 The TRASAS Group shall make proposals and promote improvements for the safety and efficiency of the Northern area route structure and the supporting ATM systems within the States affected by such proposals. It shall base its work on aircraft operators' requirements, which may be expanded and complemented, as necessary.

3.2 The Group shall take into account modern space based technology (GPS/GLONASS/GNSS and ADS) in accordance with the ICAO CNS/ATM system concept and plan for an orderly transition period. This transition period should enable a seamless migration of current aircraft fleets to full CNS/ATM compliance on such routes in the future. TRASAS shall consider an equitable cost recovery scheme for the established route system in accordance with ICAO provisions in line with Article 15 of the Chicago Convention.

3.3 The Group shall not substitute itself for other existing bodies which are active under the auspices of ICAO (e.g. European Air Navigation Planning Group (EANPG), North Atlantic Systems Planning Group (NAT SPG), ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG), etc.) or bodies operating as bilateral/multilateral State initiatives. It may provide guidance as well as a co-ordinating function for these Groups working on the various technical and operational aspects related to the intended transit route network and to combine the results into one coherent overall plan. This will lead to the amendment, if and when required, of the ICAO Regional Air Navigation Plan (ANP) in accordance with procedures established by the ICAO Council.

3.4 In addition to its technical work on the newly established route system, the TRASAS Group shall explore proposals for financing and cost recovery for this system.

4. Activities

- a) To promote a modern, efficient and cost-effective international ATS route network linking city-pairs in Europe, Asia and North America, taking into account the recognized requirements of the airspace users, taking advantage of seasonal wind patterns, and making use of space-based technology in accordance with the ICAO CNS/ATM system concept.
- b) To promote efficient air traffic management and associated systems to improve safety, increase capacity and enhance operational and economic efficiency.
- c) To promote the provision of sufficient capacity so as to avoid the need for air traffic flow management (ATFM).
- d) To develop a coherent transition plan enabling a seamless migration of current aircraft fleets to full CNS/ATM compliance on such routes in the future.
- e) To promote the establishment of a minimum number of suitably equipped Area Control Centres (ACC) and an infrastructure adequate to provide the required air traffic services along the proposed ATS route structure.
- f) To promote suitable financing and cost recovery mechanisms for the newly established route system in accordance with the applicable ICAO provisions and in line with Article 15 of the Convention on International Civil Aviation (Chicago, 1944).
- g) To analyse the costs and benefits achieved by individual ATS routes of the newly established route system to determine their eligibility for inclusion into the ICAO Regional Air Navigation Plan.

4.1 TRASAS will closely cooperate with existing bodies working on relevant tasks and may also establish Contributory Working Bodies (CWB) that shall work on its behalf on specific expert issues (route network developments, RVSM implementation, communications, airport issues etc).

5. Composition

5.1 The TRASAS Group shall be composed of representatives with operational and technical, expertise from Canada, China, Democratic People's Rep. of Korea, Denmark, Finland, Iceland, Japan, Kazakhstan, Mongolia, Norway, Republic of Korea, Russian Federation, United States, Uzbekistan and from international organisations representing aircraft operators' (e.g. IACA, IATA, IBAC) and pilot associations (IFALPA).

5.2 The TRASAS Group shall work under the auspices of ICAO. The EUR/NAT Office shall provide full secretarial support to the Group.

5.3 The Group may invite participation from other States which may be concerned during the progress of its work (e.g. States in Central Asia, in the South Caucasus area, and others) and international organizations which may provide useful input during its deliberations.

6. Reporting

6.1 Reports of the TRASAS shall be prepared by the ICAO Secretariat in the usual standard fashion. As reports of an informal group, this documentation will be made available to participating States and international organization(s) and shall be distributed to the Regional Planning Groups [in particular, the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the European Air Navigation Planning Group (EANPG) and North Atlantic Systems Planning Group (NAT SPG)] for their information and to facilitate co-ordination which may be required within their respective work programmes.

7. Communication

7.1 As far as possible, members and participants in the work of TRASAS shall correspond by electronic mail. Their communications should be as informal as possible to ensure rapid progress of the work programme.

8. Target dates and deliverables

8.1 TRASAS shall establish a comprehensive work programme containing target dates and milestones to be achieved. It should strive to complete its tasks in the shortest possible time.

**AGENDA ITEM 6: REVIEW PROGRESS OF THE
REGIONAL AIRSPACE SAFETY
MONITORING ADVISORY
GROUP (RASMAG)**

Agenda Item 6: Review progress of the Regional Airspace Safety Monitoring Advisory Group (RASMAG)

Report on activities of the RASMAG

6.1 The meeting reviewed the general activities of the Regional Airspace Safety Monitoring Advisory Group of APANPIRG (RASMAG) since the last meeting of the Sub-Group in June 2006. The RASMAG had conducted two meetings as follows:

RASMAG/6 6-10 November 2006, and
RASMAG/7 4-8 June 2007

6.2 The meeting noted that, whilst a primary task of RASMAG is to review the monitoring and safety assessment activities carried out by the regional monitoring agencies established by APANPIRG for implementation and operation of reduced separation minima, other airspace safety matters were also taken into consideration by RASMAG.

Plain Language definition of Large Height Deviation (LHD)

6.3 In response to a request from WPAC/SCS RSG/1 to RASMAG to develop a user friendly plain language definition of LHD, RASMAG/7 noted that there were a number of States also experiencing difficulties in verifying and concluding whether an observed incident would count as a LHD in the RVSM airspace. Accordingly, RASMAG adopted the following plain language definition of a Large Height Deviation for regional promulgation. RASMAG/7 also agreed to promulgate suitable guidance to support the plain language definition of a LHD, as shown in **Appendix A** to the Report on Agenda Item 6.

A RVSM large height deviation (LHD) is defined as any vertical deviation of 90 metres/300 feet or more from the flight level expected to be occupied by the flight

Guidance Material for Data Link Ground Equipment Procurement and Implementation

6.4 RASMAG/7 had reviewed the final draft of the *Guidance Material for Data Link Ground Equipment Procurement and Implementation* and agreed to submit the material to the ATM/AIS/SAR Sub-Group and CNS/MET Sub-Group for review.

6.5 The meeting reviewed the *Guidance Material* and the RASMAG/7 draft Conclusion and agreed to support the *Guidance Material* (**Appendix B** to the Report on Agenda Item 6 refers) and the draft Conclusion which would be forwarded to the CNS/MET/SG/11 Meeting on 16-20 July 2007 for their review. Subject to the outcome of the CNS/MET/SG/11 review, the Secretariat would coordinate a joint conclusion from the Sub-Groups to APANPIRG/18, as follows:

**Draft Conclusion 17/15 – Guidance Material for the Asia/Pacific Region
ADS/CPDLC/AIDC Ground Systems
Procurement and Implementation**

That the *Guidance Material for the Asia/Pacific Region ADS/CPDLC/AIDC Ground Systems Procurement and Implementation* as shown in Appendix XX to the APANPIRG/18 Report on Agenda Item 2.1 be adopted and circulated as regional guidance material.

Amendments to Guidance Material for Datalink End-to-End Safety and Performance Monitoring

6.6 RASMAG/7 reviewed input from the ISPACG/21 meeting (Auckland, March 2007) and amended the regional *Guidance Material for End-to-End Safety and Performance Monitoring of ATS Datalink Systems in the Asia/Pacific Region*. The amended material would be placed on the Regional Office web site.

Non Provision of Traffic Sample Data and Large Height Deviation Reports

6.7 RASMAG/7 recalled that States not providing traffic sample data for December each year in accordance with Conclusion 16/4 would be included on the APANPIRG List of Deficiencies in the ATM/AIS/SAR fields in accordance with Conclusion 16/6.

6.8 MAAR drew the attention of RASMAG/7 to the situation where although the quantity and accuracy of data was slowly improving, MAAR still spent many hours trying to 'fill in the gaps' in data that had been submitted as the alternative was simply to discard the data as unusable. Despite MAAR's best efforts in following up with States, in a number of cases insufficient data had been forthcoming to complete a number of LHD reports, meaning that they had to be discarded from the sample.

6.9 The Pacific Approvals Registry and Monitoring Organization (PARMO) expressed similar reservations in relation to the quality of the data submitted. This had led the FAA to pursue a strategy of bi-lateral agreements in relation to the submission of data with the added cost and administrative burden again falling on the FAA.

6.10 Recalling that problems in the submission of appropriate quantity and quality of data had been raised many times previously and had led to APANPIRG endorsing Conclusions 16/4 and 16/6, the meeting supported the following conclusion which had been drafted by RASMAG/7:

Draft Conclusion RASMAG7/4 - Non-provision of safety related data by States

That, as a result of the non-provision of safety related data to approved regional safety monitoring agencies as required by APANPIRG Conclusion 16/4, Bangladesh, Fiji, Lao PDR, Myanmar, ~~Maldives~~, Nepal, Pakistan, Papua New Guinea, Sri Lanka and Tahiti be included in the APANPIRG List of Deficiencies in the ATM/AIS/SAR Fields in accordance with APANPIRG Conclusion 16/6.

6.11 The meeting noted that the Regional Office had written to the States concerned during June 2007, highlighting the draft Conclusion above and seeking the provision of a suitable traffic sample data (TSD) for December 2006 and outstanding LHD reports to the relevant RMA. The receipt of appropriate data by RMAs prior to APANPIRG/18 in September 2007 would result in the removal of that State from the Draft Conclusion above. The Maldives had provided data in response to this letter and therefore had been removed from the draft conclusion.

High number of Errors in ATC transition messages

6.12 In reviewing the reports regional RMAs, RASMAG/7 recognized that the numbers and durations of LHDs reported was driving the risk results, with a large proportion of LHDs relating to difficulties in ATC-to-ATC coordination. RASMAG/7 considered that the high number, often in the order of 40% - 50%, of LHDs attributed to errors in ATC transition messaging was by far the most critical aspect of Asia/Pacific regional RVSM operations revealed by the RMA analyses. Gaining control of this aspect was essential to ensuring operations remained within the target level of safety

(TLS) and undertaking investigations in this respect would be a logical and necessary point for States to start in attempting to reduce the instances of LHD.

6.13 RASMAG/7 recognized the value of AIDC between ATS facilities in reducing the potential for ground-ground coordination errors by enabling routine coordination to be undertaken directly between the ATS equipment in respective ATC facilities. This removed the possibility of human readback and hearback errors, resulting in a decrease in all types of coordination errors and related decrease in LHD occurrences.

6.14 In this respect, the meeting supported the following conclusion that had been drafted by RASMAG/7 for consideration by APANPIRG/18.

Draft Conclusion RASMAG7/5 – Prevalence of LHDs from ATC Unit-to-ATC Unit coordination errors

That, in noting the continued prevalence of RVSM Large Height Deviation (LHD) occurrences resulting from ATC Unit-to-ATC Unit coordination errors, as reported by RMAs assessing RVSM operations within Asia Pacific Region, the Regional Office:

- a) draws to the attention of States that investigations into LHD should concentrate in this area, and*
- b) highlights the APANPIRG recommendation that States work towards the implementation of compatible AIDC capabilities based on the Asia/Pacific AIDC ICD between ATC units as soon as possible.*

Completion of Horizontal Safety Assessment for South China Sea

6.15 In regard to the out of date horizontal safety assessment for the South China Sea parallel route implemented in November 2001, and in follow-up to APANPIRG Conclusion 17/6 urging concerned States to complete the safety assessment by 30 June 2007, MAAR had carried out the safety assessment and presented a copy of the *Safety Assessment for the South China Sea Airspace where a 60NM Lateral Separation Minimum is applied*.

6.16 Although the safety assessment was inconclusive and upon reviewing the results of the safety assessment, RASMAG/7 agreed that the situation was stable and that there was no evidence to justify any concern. However, due to insufficient safety data being available to MAAR, RASMAG agreed that the safety assessment should be repeated within about 18 months to formally demonstrate that the TLS was being met, and then again periodically or when a significant change was likely to impact the traffic volume and/or disposition.

6.17 The meeting recognised that this was the first safety assessment to be conducted in the 5 years since the implementation of the parallel route structure. Noting the significant commitment from Thailand in arranging for and conducting this safety assessment, the meeting thanked Thailand for undertaking this work on behalf of the affected States.

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Japan vertical monitoring agency

6.18 Japan advised RASMAG/7 that the Japan vertical monitoring agency was now capable of assuming full RMA status in the Asia/Pacific region. To gain RMA status, RASMAG/7 advised that APANPIRG would need to approve Japan as a regional monitoring agency (RMA). Accordingly, for RASMAG to make a recommendation to APANPIRG, Japan was requested to prepare a full submission to the next RASMAG meeting that demonstrated the capabilities of the Japan vertical monitoring agency against the requirements contained in ICAO guidance material.

Implementation of RVSM in China

6.19 RASMAG/7 reviewed progress by China and the RVSM Task Force (RVSM/TF/30, May 2007 and SCM/RVSM China, March 2007 refer) to implement RVSM planned on 22 November 2007. The meeting had considered a number of important issues related to the planned implementation by China, including the flight level allocation scheme, the use of metric flight levels, training material and flight level transition procedures for the many adjacent FIRs.

6.20 RASMAG/7 was concerned that China was not a recognized RMA in terms of approval by APANPIRG, and there was apparently no formal process in place for the safety assessment being developed for the China RVSM implementation to be approved by one of the Asia/Pacific RMAs.

6.21 However, RASMAG was aware of the substantial efforts of the FAA PARMO in assisting China to ensure that all the requirements for RVSM pre-implementation safety assessments were undertaken.

Statement of long term RVSM monitoring requirements

6.22 RASMAG/7 noted that the ICAO Separation and Airspace Safety Panel (SASP) had agreed that globally applicable minimum long-term monitoring requirements were required as the altimetry system error (ASE), which continued to show adverse drift trends, could not be detected without specialized monitoring systems and could therefore pose a serious risk if uncorrected.

6.23 In this regard, it was evident that additional long term monitoring requirements would have a significant impact regionally, and RASMAG/7 was of the opinion that work should be undertaken as soon as possible in order to assess the consequences for the Asia/Pacific Region. In this regard, the RVSM airspace safety monitoring agencies would be requested through APANPIRG to prepare regional impact statement summarizing the estimated consequences for the Region. In this context, the meeting supported the draft conclusion that had been prepared by RASMAG for consideration by APANPIRG/18, as follows:

Draft Conclusion RASMAG7/6 – Consequences of global RVSM long term height monitoring

That, the Regional Office draw to the attention of the RVSM airspace safety monitoring agencies within the Asia Pacific Region the provisional global RVSM long-term height monitoring requirements recently adopted by the ICAO Separation and Airspace Safety Panel (ICAO SASP), and request that those agencies prepare a regional impact statement summarizing the estimated consequences for the Region, including consideration of numbers of airframes required to be monitored, for initial review by RASMAG/8 in late 2007.

6.24 RASMAG/7 also reviewed matters in relation to:

- a) Outcomes of the Western Pacific South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG,
- b) Finalisation of ATS Contingency Plans for Indonesia,
- c) AIDC Interface Control Document Version 3,
- d) AIS Implementation Task Force, and
- e) Implementation of Air Traffic Flow Management across the Bay of Bengal

Asia/Pacific regional RVSM safety assessments

6.25 The meeting was presented with a summary of the most up to date safety assessments of RVSM operations in airspaces of the Asia/Pacific Region presented to the RASMAG/7 meeting (4-8 June, 2007) by the Asia/Pacific Regional Monitoring Agencies (RMAs): PARMO of the United States FAA, MAAR of the Aeronautical Radio of Thailand (AEROTHAI), and the Australian RMA of Airservices Australia.

Safety oversight review

6.26 To facilitate ongoing safety assessment in the Asia/Pacific regional RVSM airspaces, RASMAG divided the airspaces and assigned responsibility to the RMAs broadly into the following sub areas:

- a) Bay of Bengal (BOB) (MAAR)
- b) Western Pacific/South China Sea (WPAC/SCS) (MAAR)
- c) Australian FIRs (Australian RMA)
- d) Fukuoka FIR (JCAB, ENRI, MAAR, PARMO)
- e) Pacific Area (PARMO)
- f) North-East Asia (PARMO)

6.27 Safety assessments were conducted by APANPIRG RMAs on a periodic basis utilizing the continuous LHD reporting, including monthly “NIL LHD reports”, and the annual December traffic sample data required under APANPIRG Conclusion 16/4. Safety assessments were submitted by RMAs to RASMAG for review.

6.28 The meeting noted the following outcomes of the RVSM safety oversight reviews conducted by the RMAs for the sub areas for which they were responsible:

Bay of Bengal area

6.29 The RVSM safety oversight for the BOB area had been conducted based on a one-month TSD collected in December 2006 and the most recent rolling 12 months of LHD reports between January 2006 to April 2007 submitted by relevant States in the BOB region. The risk estimation was conducted based on the single alternate flight orientation scheme (FLOS) applied on the EMARSSH route structure over the BOB airspace.

6.30 Based on the collision risk estimates, both technical and total risks from the available TSD and LHD reports satisfy the agreed TLS value of no more than 2.5×10^{-9} and 5.0×10^{-9} fatal accidents per flight hour due to the loss of a correctly established vertical separation standard of 1,000 ft due to all causes, respectively.

Western Pacific/South China Sea area

6.31 The RVSM safety oversight for the WPAC/SCS area had been conducted based on a one-month TSD collected in December 2006 and the most recent rolling 12 months LHD reports between January 2006 to April 2007 submitted by relevant States in the WPAC/SCS region. The risk estimation was conducted based on the modified single alternate FLOS applied on the on the WPAC/SCS route structures.

6.32 Based on these collision risk estimates, the estimate of technical risks satisfies the agreed TLS values of no more than 2.5×10^{-9} fatal accidents per flight hour. However, the estimate of overall risk exceeds the agreed TLS values. The main cause contributing to this infringement is the significant number of operational errors, which are derived from the series of significant LHD occurrences.

6.33 RASMAG/7 reviewed the adverse trend that had been evident in terms of the WPAC/SCS safety assessment, recalling that previous RASMAG reports had recorded total risk estimates as follows:

RASMAG/3 (Jun 2005) = 4.90×10^{-9} (provisional, due lack of data)
RASMAG/4 (Oct 2005) = 3.46×10^{-9} (provisional, due lack of data)
RASMAG/5 (Jun 2006) = 7.08×10^{-9}
RASMAG/6 (Nov 2006) = 11.3×10^{-9}
RASMAG/7 (June 2007) = 6.09×10^{-9}

6.34 RASMAG/7 was pleased to note that the latest safety assessment for the WPAC/SCS airspace had shown a dramatic reversal of the adverse trend. Although it was too early to conclude that this was a stable trend, RASMAG/7 considered that it was a very pleasing result given the previous circumstances.

Australian Domestic and Indian Ocean area

6.35 Australia presented the results of the safety assessments of the Australian Domestic and Indian Oceanic airspaces undertaken by the Australian RMA. Australia had informed RASMAG/7 that discussions with PARMO had resulted in an agreement that in the future the Australian RMA would be responsible for all airspace within the Brisbane and Melbourne FIRs.

6.36 The collision risk estimates determined by the Australian RMA, satisfy the agreed TLS values of no more than 2.5×10^{-9} (technical risk) and 5.0×10^{-9} (overall risk) value of 5.0×10^{-9} fatal accidents per flight hour.

Fukuoka FIR

6.37 Japan presented RASMAG/7 with the result of the RVSM airspace safety assessment for the Fukuoka FIR conducted by JCAB in coordination with PARMO and MAAR, and with the assistance of Japan's Electronic Navigation Research Institute (ENRI).

6.38 The overall risk result of the RVSM safety assessment for the Fukuoka FIR exceeded the regionally agreed TLS mainly due to the LHDs caused by "Errors in ATC-unit-to ATC-unit transfer". JCAB would continue to take remedial actions to reduce the overall risk and continue collecting TSD and LHD reports and coordinate safety assessments to ensure the continuing safety of RVSM operations.

Pacific area

6.39 The technical risk was estimated to be 0.0973×10^{-9} fatal accidents per flight hour. The operational risk estimate is 1.56×10^{-9} fatal accidents per flight hour. The estimate of the overall vertical collision risk was 1.66×10^{-9} fatal accidents per flight hour. This estimate was roughly 66 percent below the regionally agreed TLS value of 5.0×10^{-9} fatal accidents per flight hour. This estimate was based on the most recent 12 months of large height deviation reporting and recently updated collision risk parameters based on the December 2006 traffic samples collected.

North East Asia area

6.40 The technical risk was estimated to be 0.0857×10^{-9} fatal accidents per flight hour. The operational risk estimate is 1.013×10^{-9} fatal accidents per flight hour. The estimate of the overall vertical collision risk was 1.098×10^{-9} fatal accidents per flight hour. This estimate was roughly 78 percent below the regionally agreed TLS value of 5.0×10^{-9} fatal accidents per flight hour. This estimate was based on the most recent 12 months of large height deviation reporting.

Exceeding Target Levels of Safety

6.41 In noting that the RVSM TLS was being exceeded in both the WPAC/SCS airspace and the Fukuoka FIR, RASMAG/7 recalled discussions that had first been held during RASMAG/3 (June 2005). RASMAG/3 had reviewed references in Annex 11, the *Air Traffic Services Planning Manual* (Doc 9426) and the *Manual on Airspace Planning Methodology for the Determination of Separation Minima* (Doc 9689) in this respect, noting guidance in respect to the derivation and application of TLS.

6.42 The meeting noted that RASMAG had agreed, following its review of ICAO guidance, that a single occasion in which airspace safety monitoring identified that the TLS had been exceeded, was not sufficient cause to cease the application of the separation minimum. Fluctuations about the TLS should serve as a warning bell to prompt intensive investigation of the circumstances to consider action to be taken in line with ICAO guidance, to continue monitoring and re-assess the safety on a regular basis to ensure that there was not an unsafe trend.

6.43 The meeting expressed appreciation to RASMAG and the RMAs who together continued to provide effective safety oversight of RVSM monitoring activities in the Asia/Pacific Regions in accordance with the regional programmes required under Annex 11 provisions.

Funding of regional airspace safety monitoring

6.44 APANPIRG/16 (August 2005) had required under Conclusion 16/2 that a study group develop a feasible and sustainable means to organize and finance the necessary regional airspace safety monitoring mechanisms and to report through RASMAG. Work on the subject had been overtaken by events when the Council of ICAO took note of difficulties in sustaining safety monitoring activities in other ICAO Regions and referred the matter to ALLPIRG/5 (March 2006, Montreal) and the Sixth Meeting of the Air Navigation Services Economics Panel (ANSEP/6, March 2006, Montreal). The outcome of the deliberations of these bodies was that a global approach was developed based on the designation of Regional Monitoring Authority (RMA) activities as multinational facilities/services in accordance with existing FASID provisions.

6.45 However APANPIRG/17 (August 2006) recognized genuine concerns expressed in respect to the general complexity of the matters under discussion and specifically in relation to matters of legal liability. It was considered unreasonable to expect States to commit to the establishment of organizational entities until appropriate organizational documentation, terms of reference etc. had been drafted. APANPIRG/17 believed that this would require careful and focused consideration. In order to allow States time to consult within their administrations and consider the matter thoroughly, the meeting agreed under Decision 17/47 to establish the Regional Airspace Safety Monitoring Committees Task Force (RASMC/TF) and drafted terms of reference accordingly.

6.46 Subsequent to this the Directors General of Civil Aviation in Asia and Pacific at their 43rd Conference held in December 2006 noted the concern expressed by RASMAG that progress had been slow in establishing sustainable financing and organizing safety monitoring entities. The 43rd DGCA adopted Action Item 43/4 – *Funding of Safety Monitoring* urging the administrations associated with the RASMC/TF to designate appropriately empowered experts to participate in the Task Force.

Outcomes of RASMC/TF

6.47 During the first meeting of the RASMC/TF (RASMC/TF/1, 13-15 February, 2007) the Secretariat expressed optimism that, given the support from APANPIRG and the DGCAs described above, the RASMC/TF now would be equipped to achieve the outcomes expected by APANPIRG and the DGCAs and asked RASMC/TF/1, in addressing its terms of reference, to reflect on the following points:

- a) the importance of safety monitoring in order to ensure that on-going CNS/ATM implementation initiatives in Asia/Pacific will not be delayed and that safety and efficiency will not be compromised;
- b) the experience that voluntary funding mechanisms currently relied upon to provide for safety monitoring are not sustainable;
- c) the directive from the President of the ICAO Council to all ICAO Regional Directors recommending that RMAs be implemented as multinational (ICAO) air navigation facilities/service in accordance with a step-by-step procedure; and
- d) the requirement under Decision 17/47 for the RASMC Task Force to develop and distribute to States by 30 June 2007 implementation proposals for the establishment of Regional Airspace Safety Monitoring Committees.

6.48 The RASMC/TF/1 meeting gave thorough consideration to the steps that would be required to designate RMA, CRA and SMA services as multinational facilities/services in accordance with the guidance provided in the FASID and in accordance with the recent ICAO ‘Step-by-Step’ guidance. It was apparent to the meeting that the complexities of Asia and Pacific in terms of the number of States involved, their varying circumstances, the size and characteristics of the airspaces involved, and the way in which safety monitoring requirements had evolved presented issues that would take time to resolve by expertise (legal and financial) which was regrettably not available to the Task Force.

6.49 With the guidance of the meeting the United States drafted a “Memorandum of Agreement” that was intended to be reached between the FAA and participating States for the purpose of funding the Pacific Approvals Registry and Monitoring Organization (PARMO). The Draft Agreement was viewed by RASMC/TF/1 as a constructive development and it was agreed that the United States should work with affected States to prepare and implement cost sharing agreements for the provision of RMA and SMA safety monitoring services between themselves on this basis.

6.50 RASMC/TF/1 considered that the use of multilateral or bilateral agreements between States would address the immediate difficulties in the Pacific area and ensure the continuation of safety monitoring services that were presently under threat.

6.51 Immediately following RASMC/TF/1 the FAA completed an internal analysis of the scope and effort required to draft, negotiate, sign and implement new bilateral agreements with all associated CRA and RMA States. This analysis included a determination of the types and numbers of agreements required, the human resources required to draft each agreement and complete all internal FAA and U.S. Government review and approvals, and to coordinate approval of each agreement with the respective States.

6.52 This FAA analysis determined that the amount of internal resources required to complete the aforementioned bilateral agreements to establish cost sharing of CRA and RMA services would be significantly higher than the approximately \$40,000 USD that would be collected annually for the CRA services and \$14,000 USD that would be collected annually for the RMA services.

6.53 Therefore, in relation to the provision of RMA and CRA services in the Pacific, the FAA has decided not to pursue any cost sharing agreements. However, the FAA will continue to completely fund the provision of these services for the foreseeable future.

6.54 Notwithstanding, the FAA would continue to provide strong support to ICAO, both in the Asia Pacific region and globally, to establish equitable cost sharing mechanisms requiring affected States to meet their fair share of the overall costs for providing CRA and RMA type services. The FAA also strongly supported the establishment of a process which would review the qualifications of potential providers of safety monitoring services and credential those organizations which satisfy objective criteria developed as part of the process. The FAA remained committed to support ICAO in these endeavors through the RASMAG and other appropriate regional bodies.

RASMAG/7 review of RASMC/TF/1

6.55 RASMAG/7 expressed its strong appreciation for the ongoing support of both the United States and Thailand in absorbing the costs in order to continue to provide RMA and additional safety monitoring services on behalf of many States regionally. However, the United States and Thailand, as well as the Australian RMA, expressed concerns in relation to pending provisions for long term RVSM monitoring which were expected to increase the responsibilities and commitments of RMAs globally. Associated increases in RMA resources, with additional costs, would be necessary to meet the global long term monitoring provisions. As this would throw additional financial pressures on to existing voluntary arrangements, all regional RMA providers would have to seriously reconsider their position in continuing to absorb the costs of providing such services on behalf of others.

6.56 It was also evident to RASMAG/7 that an important ingredient had been missing from all the regional discussions on this matter, that of appropriate financial and legal experts who were empowered to make decisions in this respect. Despite full support from APANPIRG and the Conference of Asia/Pacific Directors General, both RASMAG and the RASMC/TF had continued to suffer with inadequate representation from appropriate financial and legal experts to progress the complex matters under discussion. Without representatives with the appropriate skill-set it would not be possible to make any progress in these issues.

6.57 RASMAG/7 recalled that as a result of its technical focus, as opposed to legal/financial focus, RASMAG had previously struggled with making any progress in the funding matters, leading to the preparation by RASMAG/5 of the comprehensive submission to APANPIRG/17 that had resulted in the formation of the RASMC/TF. To simply dissolve the RASMC/TF and return its responsibilities to RASMAG would likely result in the same position already experienced by RASMAG/5 a year ago. As such, RASMAG/7 did not support the draft decision for dissolution prepared by the RASMC/TF. However, RASMAG/7 considered that some of the proposed amendments to the RASMAG TORs that had come forward from the RASMC/TF would enhance the functions of RASMAG, and agreed to recommend to APANPIRG that amended TORs for both RASMAG and the RASMC/TF be adopted.

6.58 The decision by the United States to continue to completely fund RMA and CRA services in the Pacific had overcome the immediate threat to the provisions of these services and meant that the RASMC/TF had more time to identify a sustainable long term solution. RASMAG/7 requested that the Secretariat again present the issues, as originally described in the submission from RASMAG/5 to APANPIRG/17, for the attention of APANPIRG/18, highlighting strongly that participation of State and ICAO legal and financial experts was essential and recommending that the RASMC/TF be tasked to fulfil its original objective albeit, in recognition of the complexities, over a longer period of time.

6.59 The meeting expressed its strong support for the actions taken by RASMAG in this respect and requested that the Secretariat circulate Working Paper 16 to the ATM/AIS/SAR/SG/17 meeting via State Letter in order to allow States time to make adequate preparations for the APANPIRG/18 meeting in early September. The meeting also adopted the following Decision:

ATM/AIS/SAR/SG/17 Decision 17/1: Actively pursue robust arrangements for the equitable funding of safety monitoring

That, noting the long delays to CNS/ATM implementation attributable to inability to fund safety monitoring services, the imminent implementation of long term RVSM height monitoring requirements and the associated additional workload/costs thereby accruing to existing voluntarily funded Asia/Pacific RMAs, APANPIRG take all actions necessary to resolve the long standing difficulties in establishing robust and equitable arrangements for the regional funding of airspace safety monitoring, including:

- a) re-tasking the Regional Airspace Safety Monitoring Committees Task Force, and
- b) ensuring the attendance of appropriately prepared and empowered legal and financial experts from States and ICAO at relevant regional meetings.

Asia/Pacific Regional Airspace Safety Monitoring Advisory Group (RASMAG)

Reporting of RVSM Large Height Deviations

Since June 2007, RASMAG has adopted the following guidance for internal application by Asia/Pacific RVSM Regional Monitoring Agencies (RMAs) – The Monitoring Agency for the Asia Region (MAAR), the Pacific Approvals Registry and Monitoring Organization (PARMO), and the Australian RMA. RASMAG has agreed to make the RMA guidance widely available to States in order to assist States in verifying and concluding whether an observed incident should also be reported to the responsible RMA as a Large Height Deviation (LHD) in RVSM airspace.

RASMAG notes that LHD reporting does not take the place, in any way, of the normal ATS incident reporting requirements promulgated under respective State ATS Safety Management System requirements and considers that, in most cases, situations leading to a LHD occurrence would have already met the criteria for reporting as an ATS incident. Notwithstanding, supplementary reporting of LHD occurrences to Asia/Pacific RMAs in accordance with the published requirements of the RMAs is an essential part of the regional airspace safety monitoring requirements called for under Annex 11, paragraphs 3.3.5.1 & 3.3.5.2.

Definition of Large Height Deviation

Based on, amongst others, the *Guidance Material on the Implementation of a 300 M (1,000 ft) Vertical Separation Minimum (VSM) between FL290 and FL410 Inclusive for Application in the Airspace of the Asia Pacific Region* and discussions during the meeting, RASMAG has adopted the following plain language definition of a Large Height Deviation:

A RVSM large height deviation (LHD) is defined as any vertical deviation of 90 metres/300 feet or more from the flight level expected to be occupied by the flight.

Possible causes of Large Height Deviation

The causes of a LHD occurrence may include:

- Operational errors (aircraft operating at a flight level other than the assigned flight level due to ATC/Pilot loop errors and incorrect clearance), which are categorized into three causes:
 - Flight crew not following the correct ATC clearance
 - ATC issuing an incorrect ATC clearance
 - Receiving ATC unit unable to apply the separation standards during a transfer of control responsibility between two ATC units.
- Aircraft contingency events occurring in situation where the pilot cannot initially follow normal contingency procedures and is forced to climb/descend through flight levels before diverting from track,
- Deviation due to the effect of high level meteorological conditions, and/or
- Deviation due to Traffic Collision Avoidance System (TCAS) advisories, which includes:

- o Flight crew correctly following the TCAS Resolution Advisory (RA), **[see note below]**,
- o Flight crew incorrectly following the TCAS RA, and
- o Any vertical displacement not conforming to the resolution advisory.

Note: LHD resulting from actions complying with a TCAS resolution advisory would not necessarily reflect risk in the RVSM airspace since it is a proper remedial action of flight crew. Nonetheless, it is strongly recommended that all LHD occurrences related to TCAS resolution advisory be reported to the responsible RMA for detailed airspace safety analysis.

Categorization of LHD in RVSM Safety Monitoring Reports

In order to be consistent with the plain language LHD definition and associated guidance listing possible causes of LHD occurrences adopted by RASMAG in June 2007 (see above), revisions to the LHD categorizations applied by regional RMAs prior to June 2007 were necessary. Accordingly, RASMAG adopted the revised LHD categorizations described in Table 1 below for adoption by all RMAs serving the Asia/Pacific Region.

Code	RVSM Operations Large Height Deviation Categorization
Operational Errors	
A	flight crew failing to climb/descend the aircraft as cleared;
B	flight crew climbing/descending without ATC clearance;
C	Incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearances etc);
D	ATC system loop error; (e.g. ATC issues incorrect clearance or flight crew misunderstands clearance message);
E	coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues (e.g. late or non-existent coordination, incorrect time estimate/actual, flight level, ATS route etc not in accordance with agreed parameters);
F	coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues;

Code	RVSM Operations Large Height Deviation Categorization
Operational Errors	
Aircraft Contingency Events	
G	aircraft contingency event leading to sudden inability to maintain assigned flight level (e.g. pressurization failure, engine failure);
H	airborne equipment failure leading to unintentional or undetected change of flight level (e.g. altimetry errors);
Deviation due to Meteorological Condition	
I	turbulence or other weather related causes;
Deviation due to TCAS RA	
J	TCAS resolution advisory; flight crew correctly following the resolution advisory; <i>Note: LHD resulting from actions complying with a TCAS RA would not necessarily reflect risk in the RVSM airspace since it is a proper remedial action of flight crew. Nonetheless, it is strongly recommended that all LHD occurrences related to TCAS resolution advisory be reported to the responsible RMA for detailed airspace safety analysis.</i>
K	TCAS resolution advisory; flight crew incorrectly following the resolution advisory
Others	
L	An aircraft being provided with RVSM separation is not RVSM approved (e.g. flight plan indicating RSVM approval but aircraft not approved, ATC misinterpretation of flight plan)
M	Other

Table 1: Large Height Deviation Categorizations

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE**



**DRAFT GUIDANCE MATERIAL
FOR THE ASIA/PACIFIC REGION
FOR ADS/CPDLC/AIDC GROUND SYSTEMS
PROCUREMENT AND IMPLEMENTATION**

Draft V-0.9

Issued by the ICAO Asia/Pacific Regional Office, Bangkok

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CHAPTER 1 INTRODUCTION

This material has been developed under an initiative of the Regional Airspace Safety Monitoring Advisory Group (RASMAG) of the Asia Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) to assist air navigation service providers (ANSP) with the implementation of datalink-based air traffic management (ATM) systems.

For the purposes of this document, a datalink-based ATM system is one which supports automatic dependent surveillance (ADS), controller-pilot datalink communications (CPDLC) and air traffic service (ATS) interfacility datalink communications (AIDC).

Integrated datalink systems are playing an increasingly important role in air traffic management. Datalink operations support reduced separation minima and so directly contribute to increased airspace capacity. Controller and pilot workload is reduced, and operational safety enhanced, by the automation enabled by datalink systems. As the use of these systems spreads, so more ANSPs must equip with the appropriate facilities.

The material covers two main aspects of implementation: specification and deployment.

Technical systems must be carefully specified from both the technical and operational aspects, and at the right level of detail: enough to ensure that the requirements are met, but not so much that good solutions may be excluded.

The deployment of a new system involves a number of vital steps, such as testing, training, integrating and commissioning.

This material offers guidance, rather than solutions, with the emphasis on specifying systems supporting ADS, CPDLC and AIDC.

It is not the intention of this document to provide the detailed technical information required to specify datalink applications: this information may be found in the various ICAO and other documents referenced.

1.1 OBJECTIVE

The objective of this document is to provide guidance on the specification, procurement and implementation of datalink systems for States and service providers unfamiliar with these systems.

1.2 SCOPE

The material is divided into three sections. The first covers the generalities of procuring and implementing a new system, the second is concerned with the requirements of a datalink-based ATM system, and the third gives guidance on specifying a system.

For the purposes of this material, it is assumed that the ANSP is the organisation setting out to procure a system.

1.2.1 Procurement and Implementation

Procurement and implementation includes:

- Planning and contracting
- Supervision and inspection
- Preparation for operation
- Operational transfer

1.2.2 Requirements

The Requirements section covers general requirements for datalink systems and specific requirements for:

- Datalink Initiation Capability (DLIC)
- ADS
- CPDLC
- AIDC

1.2.3 Specification

The Specification section offers guidance on the specification of:

- System configuration
- Interfaces
- Functionality
- Human-Machine Interface
- Capacity and parameters
- Recording and data analysis

1.3 SYSTEMS OVERVIEW

A key objective of datalink systems is to support reduced separation minima: any new datalink system should be capable of supporting 30NM lateral and 30NM longitudinal separation based on RNP 4.

1.3.1 ADS

Automatic Dependent Surveillance is a surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position, and additional data as appropriate. There are two forms of ADS:

broadcast ADS (ADS-B) and contract ADS (ADS-C). With ADS-B, aircraft broadcast positional data up to twice per second; the data may be used by ground systems (and other aircraft). With ADS-C, aircraft report directly to one or more ground systems with specified data at predetermined intervals (usually tens of minutes).

Note: Throughout this document, the abbreviation ADS refers to ADS-C.

The ADS data link application allows the implementation of reporting agreements, or “contracts”, which, with the exception of an aircraft in an emergency situation, are established exclusively by the ground. An ADS contract is an ADS reporting plan which establishes the conditions of ADS data reporting (i.e. the data required by the ATC system and the frequency of the ADS reports which have to be agreed upon prior to the provision of the ADS services). ADS information may be exchanged between the ground system and the aircraft by means of a single contract or a series of contracts. An ADS contract specifies under what conditions an ADS report will be initiated, and what data groups will be included in the reports.

There are three types of contract:

- *Periodic contracts* provide a report at a regular periodic interval determined by the ground system.
- *Event contracts* provide a report when or if a specified event or events take place.
- *Demand contracts* provide a single report when requested by the controller.

1.3.2 CPDLC

Controller Pilot DataLink Communications (CPDLC) is a data link application that provides a means of communication between controller and pilot, using data link for ATC communications.

Sending a message by CPDLC consists of selecting the addressee, selecting and completing, if necessary, the appropriate message from a displayed menu or by other means which allow fast and efficient message selection, and executing the transmission. The messages include clearances, expected clearances, requests, reports and related ATC information. A “free-text” capability is also provided to exchange information not conforming to defined formats. Receiving the message will normally take place by display and/or printing of the message.

CPDLC overcomes a number of the shortcomings of voice communication, such as voice channel congestion, misunderstanding due to bad voice quality and/or misinterpretation, and corruption of the signal due to simultaneous transmissions.

1.3.3 AIDC

ATS Interfacility Datalink Communications is a data link application that provides the capability to exchange data between ATS units in support of critical ATC functions.

AIDC defines messages which are related to three phases of coordination as perceived by an ATSU.

- *Notification*, in which the aircraft trajectory and any changes may be conveyed to an ATSU from the current ATSU prior to coordination.
- *Coordination*, in which the aircraft trajectory is coordinated between two or more ATSUs when the flight approaches a common boundary.
- *Transfer*, in which communications and executive control authority is transferred from one ATSU to another.

Other AIDC messages support ancillary ATC data changes between ATSUs, including the exchange of free-text messages.

Other than the formal international communication protocol standards, internet protocol (TCP/IP) as a flexible and low cost de-fact industry standard is recommended.

CHAPTER 2 PROCUREMENT

2.1 GENERAL

2.1.1 System Quality

The overall quality of a system, the Total System Quality, is the product of three main elements: the quality of the design, the quality of production and the quality in operation.

The **Design Quality** is a measure how well the design process has translated the operational requirements into user specifications and the user specifications into product specifications. The design quality depends upon both the definition of operational requirements and development of user specifications by the ANSP and the system design skills of the vendor. If the operational requirements are not well defined, the specification will be compromised and the system design cannot be expected to meet the real requirements. Similarly, if the specification does not correctly reflect the operational requirements, neither will the system design.

The **Production Quality** is a measure of how exactly the products match the specifications, and applies to the hardware, the software and the integration of these to form the system as a whole. In general, the vendor is responsible for production quality.

The **Operational Quality** is a measure of how the actual operation of the system realizes the operational objectives. This depends primarily on the way the system is operated: a badly operated system is not a good system. The operational quality is mainly influenced by the operational management of the ANSP.

The **Total System Quality** is the product of design quality, production quality and operational quality. To achieve high total system quality is clearly necessary to maintain the highest possible quality in each of the three areas.

Cooperation between the ANSP and the vendor is essential to achieve a high total system quality.

2.1.2 Roles and Responsibilities of the ANSP

The ANSP is ultimately responsible for successful implementation of the system. It is therefore vital that the ANSP takes a positive and active role throughout the system procurement and implementation.

The vendor is only responsible for developing and integrating a system to the ANSP's specific requirements.

Air traffic controllers, as the end-users of the system, must play a positive and active role throughout the procurement and implementation activities. The clear and complete definition of operational requirements and the final testing in an operational environment are both critical and are unlikely to be completed successfully without significant controller input. Clearly defined system requirements and specifications are vital in order for potential vendors to be able to offer a suitable system.

Controllers should also be able to contribute to the design, development and integration activities, and must be directly involved in the testing and commissioning processes.

2.1.3 Relationships: Requirements, Specification and Test/Evaluation

The figure below shows the relationships between the operational requirements, the system requirements, the specification, the design and the test and evaluation process. Only the combination of a complete and feasible definition of the requirements, consistent design, quality assured development and adequate review, testing and evaluation at each stage can provide a quality system.

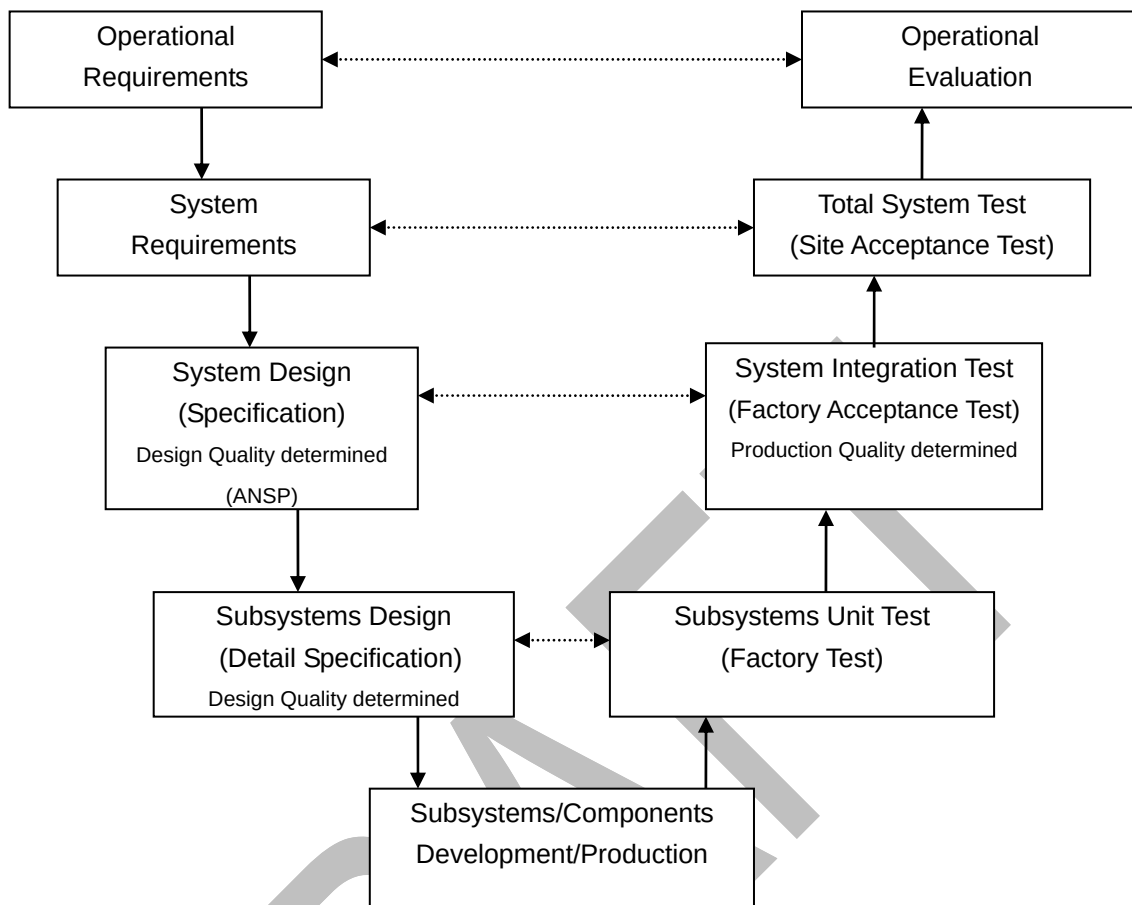


Figure1. Relationship between Requirement, Specification and Test/Evaluation

2.2 PROJECT MANAGEMENT

A project manager should be appointed as early as possible in the project. The basic role of the project manager is to ensure that the project proceeds within predetermined time, resource and cost boundaries. Project management requires a range of special skills, and serious consideration should be given to employing a professional project manager for the duration of the project.

The project manager must be given appropriate levels of financial and organisational authority so that he or she can make project decisions without constant recourse to higher management. It is essential that the terms of reference of the project manager are clearly documented and that they detail these authorities.

The project manager will be responsible for managing all aspects of the project, with particular emphasis on scheduling the many activities of ANSP personnel to match those of the system supplier. He or she will also play a major role in keeping the

project within the time and budget constraints by determining what, if any, changes are made to the scope of the contract.

2.3 PLANNING AND CONTRACTING

2.3.1 Operational Requirements

The first, and perhaps most critical, stage of the planning and contracting phase is the definition of the ATS Operational Requirements; these must clearly define precisely what the system is to do. Operational requirements should not define how the results are to be achieved – that can be done in the specification.

There is no place for choice in a requirement, and the wording must reflect this; “must”, “shall” and “will” make requirements mandatory. The use of words such as “may”, “should” and “could”, “maximum” and “minimum” and “if”, “except” and “unless” make a requirement imprecise, because the reader does not know exactly what is required. “There should be 10 sectors” or “there should be at least 10 sectors” is vague. “There will be 10 sectors” is precise and leaves no doubt as to what is required.

The operational requirements should be established by a team of experienced controllers whose professional knowledge and experience encompasses all aspects of the ATS operation; the team should also include engineers and, as necessary, other specialists.

2.3.1.1 Studies of Existing Systems

The operational requirements team must have an appreciation of how datalink systems work in the operational environment; this is best achieved by studying existing systems and talking to experienced controllers, engineers and managers in other ATS facilities. The study should cover operational and technical practices and should pay particular attention to problems encountered and lessons learnt.

Controllers using these systems will be well aware of any features that do not work well or are not user-friendly, and will have suggestions for how the system could be improved. This is valuable information that should be considered when developing the specification and during the contract negotiation phase; in the latter case, a supplier could be invited to change such features in an otherwise satisfactory system.

2.3.1.2 Confirmation of Service Environments

The operational requirements team should establish the current ATS environment as the baseline, taking into account:

- Airspace structure and major airports.

- Sector configuration and VHF/radar coverage.
- The required separation minima (30/30NM horizontal separation or better)
- Traffic flows (routes, number, flight levels, etc.).
- ATS procedures.
- Related ATS facilities.

2.3.1.3 Operational Requirement Analysis

From the baseline, the team should analyse trends to determine the likely changes in the operational environment over the projected life of the system. The operational requirements can then be determined, if necessary using the projected environment at several points during the projected system life, and should detail, at the very least:

- The anticipated peak and mean traffic levels.
- The number of sectors, based on the traffic levels.
- Specific services for each sector.
- Inter-sector services.
- Inter-ATSU services.

Once these are established, the specific requirements to provide these services, such as displays and communications, can be determined.,

2.3.2 Design and Review

The next stage is for the team to define the system concept in terms of both operational requirements and technical feasibility, perhaps using other facilities as a base reference. The concept should be reviewed by controllers and managers who are not part of the team; any changes proposed should be discussed with the team and the concept modified accordingly.

2.3.2.1 Conceptual Design

The conceptual design must be documented clearly and should include the following:

- ATS functions needed (e.g. ADS reports, traffic display).
- Performance goals for the targeted airspace.
- Sector configuration.
- Physical configuration and layout.

- System operation (e.g. redundant parallel operation, automatic recovery, etc.).
- Standards to be applied (e.g. ARINC-745, RTCA DO-258A).
- Interface requirements for related ATS facilities.
- Datalink Service Provider (DSP) and its interface.
- Human Machine Interface (e.g. display size, use of colour, input devices).

The document should also identify any new operational procedures that may be required, both for new techniques, such as the use of ADS, CPDLC and AIDC, and for other changes.

2.3.2.2 Technical Feasibility Study

The team may then determine the technical feasibility of meeting the operational requirements, particularly in terms of the functionality required, the characteristics and performance of existing systems and the available budget. Preliminary information from vendors will give an indication of the systems and capabilities that are available, so that the team can decide on the most appropriate procurement option:

- A standard “off-the-shelf” system.
- A customized off-the-shelf system.
- A custom-built system.

The criteria to be used in evaluating systems in the market will include:

- Functionality meeting the requirements.
- Adequate performance and capacity to handle future traffic.
- User-friendly and intuitive operation.
- High reliability under all anticipated service conditions.
- Simple connection with related systems and facilities.
- Required standards are met.

2.3.2.3 Specification

When the operational requirements and the feasibility studies have been completed the specification can be developed. This is discussed in detail in CHAPTER 5.

2.3.2.4 Design Review

The purpose of this design review is to ensure that the conceptual design meets each and every one of the operational requirements and that it is technically achievable and attainable.

The design review team should be independent of the requirements team but should also comprise controllers, engineers and managers. The review may take the form of a walk-through of the conceptual design documents or a desk-top simulation.

The design review report should cover:

- Compliance with operational requirements.
- Connectivity with related systems and adjoining facilities.
- Flexibility and expandability in the future.
- Any operational or technical issues.

2.3.3 Request for Proposal (RFP)

A fully-documented and approved Request for Proposal (RFP) should be submitted to prospective vendors.

2.3.3.1 Objective

The objective of the RFP is to secure fully compliant proposals from a number of competent vendors.

2.3.3.2 Content

The RFP should contain all the information required for prospective vendors to make a complete and compliant proposal. Any omissions will result in enquiries from vendors, which will take time and effort to respond to. The RFP should contain:

- The specification.
- Operating environment, including:
 - o External temperature and humidity ranges.
 - o Temperature and humidity ranges in the equipment area and operational area.
 - o Mains power supply voltage and frequency.
- Acceptance testing requirements.
- Maintenance support requirements.
- Training requirements.

- Warranty requirements.
- A draft contract, to allow vendors to see what contract requirements they will have to meet, and what arrangements they may have to make to meet them.
- Bidding conditions, including:
 - o Submission of separate technical and financial bids.
 - o Confidentiality.
 - o The enquiry process.
 - o The closing date for enquiries.
 - o The closing date for bids.
 - o Notification of short-listed bidders.
 - o Notification of preferred bidder.
- Financial conditions, including
 - o Bid bonds (if required).
 - o Requirements for financing (if necessary).
 - o Proposed payment schedule.
- The proposal evaluation process, including the evaluation criteria.

2.3.3.3 Enquiry Process

It is inevitable that some bidders will ask for clarification of details or for additional information. To avoid giving advantage to any particular bidder, there should be a formal process to ensure that all bidders receive the same information. This may be done by issuing a bulletin to all bidders containing each question received and the response. This should be done at frequent intervals so that vendors have time to adjust their proposals if necessary.

2.3.4 Evaluation of Proposals

Proposals must not be opened before the stated final date for bids.

The evaluation of proposals must be, and be seen to be, fair and traceable. All stages of the evaluation process should be clearly documented and the reasons for each decision recorded.

Ideally, the evaluation team will include all the members of the team that drew up the specification, complemented by other personnel as necessary. It is good practice to isolate the evaluation of the financial proposal from the rest of

the process. Besides maintaining the confidentiality of the financial bids, this avoids any influence of the technical evaluation on the financial and *vice versa*.

The evaluation process and criteria stated in the RFP must be strictly followed: this should avoid any protest by unsuccessful bidders.

Proposals are not always perfect, nor do they always fully cover every item of the RFP, and so there may be a need for clarification during the evaluation phase. It may be necessary to request additional technical or financial information in order to complete the evaluation; this should take the form of a simple request for the specific information required. However, there should be no negotiation at this stage, of either technical or financial elements.

Once the preferred bidder has been selected, the other bidders should be informed that they may be invited to negotiate if a contract cannot be concluded with the preferred bidder.

2.3.5 Contract Negotiation

There should be no negotiation with bidders before the selection process has been completed. Once the preferred bidder has been determined, negotiations on the detailed conditions are acceptable. Negotiations may be by correspondence or face-to-face, and should involve the appropriate experts from the ANSP.

It is important that the negotiations cover all aspects of the contract, including the vendor's schedule. The negotiating advantage is with the purchaser until the contract is signed; it then passes to the vendor. Changes made after the contract has been signed are inevitably costly and often time-consuming.

The negotiations must be clearly documented.

If a satisfactory contract cannot be concluded, the next preferred bidder may be invited to negotiate a contract; alternatively, the tender process may be started again, but this is a costly process and is unlikely to produce a better outcome.

When the contract has been signed, the other bidders should be informed.

CHAPTER 3 IMPLEMENTATION

The implementation phase begins when the contract is signed.

Typically, the vendor's activities during the implementation phase include design review, manufacture, factory testing, documentation, training, delivery, installation, site acceptance testing and handover.

The ANSP is involved in all these activities to some degree, except manufacture; but the ANSP must also prepare for the operation of the system. This will involve developing test requirements, planning training, organising staff deployment, developing procedures and planning the operational transfer from the existing to the new system.

3.1 IMPLEMENTATION SCHEDULE

The project manager can now use the vendor's schedule as the basis for finalising the overall project schedule. The project schedule should detail all anticipated activities, including system design reviews, factory and site acceptance tests, training (both vendor training and internal training), commissioning and operational transfer. The schedule should also show related activities such as development of operational and technical procedures and preparation of operational material such as charts.

3.2 CONTRACT SUPERVISION

The project manager is normally responsible for supervision of the contract works. This can generally be achieved by monitoring the vendor's progress reports, at least until the vendor starts work on site.

It is likely that desirable changes to the specification or the contract will be identified during design reviews or factory testing. However, careful management of change is essential. Every change will incur costs and delays.

A formal change control system should be implemented, with every change being submitted for approval only after costs and delays have been established. The procedure should identify the levels of cost and delay that the project manager can approve.

3.3 SYSTEM DESIGN REVIEW

This review takes place after the vendor has completed the design for the system, and, as with the concept design review, is intended to ensure that the design meets all the operational and technical requirements. The design review is the point at which the design quality is determined. It is also the last stage at which design changes should be made; however, changes made at this stage are likely to incur costs and delays.

3.4 FACTORY ACCEPTANCE TEST

The factory acceptance test is the last opportunity for the ANSP to identify problems before the system is shipped out from the factory and is the point at which the production quality is determined. It is also usually the first opportunity for ANSP personnel to examine and try out the system, and is often combined with factory-based training. It is important that operational as well as technical personnel attend the factory acceptance: it should be a test of operational features as well as of technical compliance.

The vendor should produce a detailed test schedule well before the beginning of the test, so that the ANSP can consider whether the tests meet the requirements and whether any additional tests should be included.

The results of any tests performed by the vendor before the acceptance test should be made available at the start of the acceptance test.

Any problems that are encountered during the factory test should result in agreed corrective actions to be undertaken by the vendor. These may be carried out before shipping or on site, according to the nature of the problem. The results of the factory test form an important part of the contract documentation, as they record the performance of the system and the agreed corrective actions.

3.5 PREPARATION FOR OPERATION

There are a number of items that the ANSP must address in preparation for operation of the new system. These include:

- Development of operational procedures.
- Development of system management procedures.
- Preparation of system data (for maps, etc).
- Establishment of system parameters.
- Development of internal training courses for controllers, system operators and technical staff.
- Development of operational transfer plan.
- Safety assessment.

The ANSP is responsible for carrying out these tasks, although some assistance and information from the vendor will be necessary to complete them. Some of the work can be carried before the installation begins, but it may be more convenient to leave some until the vendor's specialists are on site.

While it is not appropriate for this guidance material to address each item in detail, some items do merit discussion.

3.5.1 Operational Procedures

The FANS 1/A Operations Manual (FOM) has been adopted for Regional use and contains the procedures for the use of the datalink applications.

The ANSP may need to develop other procedures.

3.5.2 System Management Procedures

Procedures for managing the system must be developed. These should cover such topics as system start, changeovers between “main” and “standby” systems, contingency operations, map data management, data recording and monitoring,

3.5.3 Preparation of System Data

The ANSP will be required to provide data to define, for example, FIR boundaries for hand-off processing and airspace maps for the display system. The vendor will provide details of the information required and may either process the data into the system or, preferably, train and assist the ANSP staff to do so.

The preparation of this type of data can be a very detailed and time-consuming process, and due allowance should be made in the project plan.

3.5.4 Establishment of System Parameters

System parameters are used to set values for a number of variables used in the software. These parameters can be changed, but normally only by software specialists. Typical system parameters include timer intervals, for example to set the default interval between ADS periodic contracts, standard range settings, display colours, etc.

The vendor will detail the system parameters and will be able to suggest suitable values; however, the ANSP must make the final decision on each parameter. The parameters should be set before site acceptance testing, so that their effect can be determined. The parameter values should be finalised before operational transfer and changes avoided during the initial period of operation.

3.5.5 Development of Training Courses

It may not be practical or appropriate for the vendor to provide initial training for all personnel, and future training requirements must also be considered. The ANSP must develop its own training courses to complement the initial training by the vendor and to meet its future training requirements.

3.5.6 Operational Transfer Plan

The operational transfer plan should detail each step of the transfer, particularly with regard to contingency measures to recover from system problems or unexpected operational difficulties.

For each step, the plan should give details of the timing, the people involved and any other resources that may be required. It is important to clearly define the measures or events that determine that each step has been satisfactorily completed.

It is also important that the plan is made widely available so that everyone involved understands what will happen.

The operational transfer process is discussed in 3.8 below.

3.5.7 Safety Assessment

It is most important that a safety assessment (or safety case) is prepared for the introduction and operation of the system. The purpose of the safety assessment is to identify all the risks associated with the introduction and operation of the system, to establish the level of each risk and to determine how those risks can be removed or reduced to an acceptable level.

Examples of risks are ADS link failure, workstation failure, inadequate controller training, and failure to close a CPDLC message sequence.

The resulting safety assessment document will list all the risks that have been identified, the associated risk levels and the measures adopted to remove or mitigate each risk.

Safety assessments are described in detail in ICAO Doc 9859, Safety Management Manual.

3.6 TRAINING

Comprehensive training is vital so that controllers, system operators and maintenance personnel must all be able to carry out their tasks competently and effectively as soon as the system becomes operational. A comprehensive training plan is a prerequisite for a successful training programme.

Training is perhaps the most important of all the preparatory tasks.

3.6.1 Controller Training

While the separation standards that controllers apply will probably not change, at least not immediately on introduction of the new system, the tools they use will have changed significantly. The training must cover both the operation of the new workstations and the associated tools and, equally importantly, the procedures for using the datalink applications.

Training on the manipulation of the displays and controls should be provided initially by the vendor, and the ANSP's training staff should be included in the first courses. The training staff can then develop and deliver that training.

The procedures for the use of datalink applications have been developed within the Region and are laid out in regional documents. The vendor cannot be expected to provide training on datalink procedures; this is a task that must be performed by professional training controllers. The training modules must be developed well in advance, ideally in cooperation with the training sections of other ANSPs that have experience of datalink operations.

The timing of the training is important. There will almost certainly be several courses to train all controllers, and all training should be completed before operational transfer. The controllers on the earliest courses may have difficulty remembering what they have been taught; one solution is to provide short refresher courses shortly before operational transfer.

3.6.2 System Operator Training

The operation of the system includes starting and stopping the system, switching between operational and standby units, rebooting, system recovery, changing system parameters, loading data for maps, etc, and installing software changes.

The vendor must provide the first training courses for system operators. The syllabus must include the items identified above, with sufficient background to allow the operators to understand the implications of the various actions that they will be expected to perform. They should also be given a good understanding of the various functions of the system.

The training should include practical sessions using the full system, so that the operators experience the various tasks at first hand.

3.6.3 Maintenance Training

The first training courses for maintenance technicians must also be carried out by the vendor. With systems of this type, technicians must be able to diagnose faults down to circuit board level. However, as these systems include a number of computers, technicians must have an understanding of the general software structure. They should also be trained to differentiate between hardware and software faults, and to undertake simple software recovery activities.

3.6.4 Simulator Based Training

If simulator facilities are provided as part of the system, a large proportion of the training can be carried out using these facilities. Simulators are particularly valuable in allowing controllers to experience unusual or

exceptional conditions, such as traffic overloads, weather deviations, route changes, emergency descents, conflicts and system failure.

3.7 SITE ACCEPTANCE TEST

The site acceptance test is the last stage before handover by the vendor. This test is crucial. It is the last opportunity to identify problems while the system remains the responsibility of the vendor and should be resolved at the vendor's expense. Once the acceptance documents are signed, the vendor can fairly claim that any new problems are the responsibility of the ANSP and will seek costs if asked to rectify them.

The vendor should produce a test schedule well before the tests are due to start, but it is unlikely that the schedule will contain tests that exercise operational procedures. The ANSP, in consultation with the vendor, should develop operational scenarios that will test a wide range of procedures and functions and add these to the schedule.

3.7.1 Physical Checks

The first stage is typically a physical inspection and inventory check to ensure that all items are present and serial numbers recorded accurately. It is important to inspect the physical condition of all units and record any defects.

3.7.2 Technical Tests

This is generally followed by the technical tests which establish whether the system is correctly set up and is working properly. The system parameters are usually set during these tests, though some may need to be adjusted during the operational tests. System start-up, changeover and shut-down procedures, as well as contingency degradation and recovery processes, must also be tested.

3.7.3 Operational Tests

The operational tests determine whether the operational characteristics are correct, the controls function as expected and the system handles incoming and outgoing data correctly. There should also be tests to ensure that the system operates correctly under the specified maximum load.

These tests will typically take several days to complete as all functions must be tested from all workstations. A number of typical scenarios should be prepared in advance so that the tests can be carried out in a realistic environment.

It is essential that live testing of the datalink functions takes place. Tests of ADS and CPDLC will require the cooperation of either one or more airlines or alternatively an aircraft manufacturer with a suitable test-bench. If airlines are used, it must be quite clear that ATS instructions passed are for test purposes and are not to be complied with.

3.7.4 Results

As with the factory test, it is most important to record, in detail, all problems and unusual occurrences.

The outcome of the test should include an list of corrective actions to be undertaken by the vendor within an agreed timescale.

3.8 OPERATIONAL TRANSFER

The most usual ways of transferring operation to a new system are the phased transfer and the parallel operation transfer.

3.8.1 Parallel Operation Transfer

The parallel operation transfer starts with old system being used operationally and the new system running in parallel with its controllers going through their tasks as though that system was operational. When the time comes to switch over to the new system, the old system is operated in parallel for a short time as a fall-back in case of unforeseen problems. Operation of the new system need not be full-time until shortly before transfer: for example, it would be appropriate to start parallel operations during low traffic periods and work up to busy periods. H24 parallel operation is not necessary until immediately before and after transfer.

The parallel operation transfer is generally preferable as it allows the new system to be run, in its entirety, in an environment that is as close as possible to fully operational before actually taking over the operational load. However, it does require full staffing of both systems during periods of parallel operation.

3.8.2 Phased Transfer

In the phased approach, operations are transferred bit by bit, typically one sector at a time, until the whole operation is running smoothly on the new system. This type of transfer may be more appropriate where the space available dictates that only one or two positions can be transferred at a time or where limited staff numbers mean that it is impossible to operate both systems simultaneously.

In this type of transfer, it is good practice to keep at least one sector available on the old system as a contingency position.

3.8.3 Preparation for Transfer

The transfer must be carefully planned; in particular, there must be close coordination with external ATS units that may be affected. Staff must be thoroughly briefed before the start of the transfer process and must be kept informed of any changes to the plan.

The criteria for deciding when operations can be transferred to the new system must be clearly defined in advance. If a phased transfer is planned, transfer criteria should be set for each phase.

It is quite possible that problems will arise and it may be necessary to return the operation to the current system or to the last successful step, as appropriate. The reversion process should be established in advance – if contingencies have not been planned for, it is very likely that mistakes will be made and the problem compounded.

After the transfer has been successfully completed, it is useful to hold a debriefing to determine what went well and what did not. This can identify potential problems and possible areas of concern with both the technical and the operational aspects of the system and the new procedures.

DRAFT

CHAPTER 4 REQUIREMENTS

4.1 GENERAL REQUIREMENTS

The integrated ATS datalink system will incorporate AFN, ADS, CPDLC and AIDC.

The system will be linked with other automated systems. The FDP system provides flight plan data, such as the flight identification and flight path. The ATS operation will be enhanced if the system has the ability to feedback current aircraft positions to the FDP system to update the flight data.

The system will be linked to aircraft by a datalink service provider (DSP).

The system will be capable of transmitting and receiving AFN, ADS and CPDLC messages complying with RTCA/DO258A-EUROCAE/ED-100 and AIDC messages complying with the Asia/Pacific Regional Interface Control Document for AIDC (ICD).

The system will include the ACARS Convergence Function (ACF) to convert messages between the character-oriented data of ACARS and the bit-oriented data used in ADS and CPDLC.

The system will provide air traffic controllers with:

- Display of message exchanges.
- Display of updated aircraft positions and maps.
- Tools for measuring separation in distance or time.
- Tools for measuring angles between aircraft flight paths.
- Information on aircraft flight status.
- HMI tools for composing ADS and CPDLC messages.
- Alerts for exception conditions (e.g. expected message not received, coordination overdue).
- Conflict probe capability.
- Electronic flight progress strips, and paper strips if required.
- Presentation of emergency status.
- Other information pertinent to ATS operations.

The system capacity will be determined from:

- Traffic density at the peak hours.
- Frequency and size of messages per aircraft.

- Airspace size and number of waypoints.
- Number of FANS capable aircraft operating in the airspace.
- Anticipated growth of FANS operation.
- Number of displays.
- Number of connections for terminal systems.

4.1.1 Notification of Error Messages

The system will be capable of performing the cyclic redundancy check (CRC) on each message.

The system will be capable of format and validity checks appropriate to each message.

Controllers will be notified when the system detects:

- A message error.
- A message sequence error.
- A duplicate message identification number.
- Message non-delivery.
- An expected response not received.

4.1.2 Time Stamps and Timers

CPDLC and AIDC messages will be time-stamped; however, the form of some timestamps is actually set differently from that specified in Doc 9694.

By setting and/or deactivating various timer values for the messages received in response to transmitted messages, the system will monitor whether or not aircraft responses arrive within a specified time limit.

Timers are generally based on the operational requirements of each ATSU. However, the timers for sending messages relating to the automatic transfer of CPDLC connection and to AIDC will be set according to bilateral agreements with adjacent ATSUs concerned.

A timer file will be provided in the system for:

- Timeout settings for delayed response.
- Timing to initiate actions in ADS/CPDLC operations for:
 - Connection request (CR).
 - ADS periodic, event and demand requests.
 - Automated transfer of connection to the next ATSU.

- Sending Next Data Authority (NDA) message.
- Sending AFN Contact Advisory (FN_CAD): at least 30 minutes prior to FIR boundary message.
- Sending End Service message prior to the aircraft crossing the FIR boundary (e.g. 5 minutes before).
- Timer to trigger actions for sending AIDC messages.
- Timer for re-transmission of the message when no response is received within a specified time.

4.1.3 Applicable Documents

4.1.3.1 ICAO Documents

Annex 10, Volume III, Communication Systems

Manual of Technical Provisions for the Aeronautical
Telecommunication Network – Doc 9750

Manual of Air Traffic Services Data Link Applications – Doc 9694

Regional Supplement to the ASTERIX Interface Control Document
(ICD) for the Asia/Pacific Region

Asia/Pacific Regional Interface Control Document (ICD) for ATS
Inter-facility Data Communications (AIDC), version 2

Guidance Material for End-to-End Safety and Performance Monitoring
of ATS Datalink Systems in the Asia Pacific Region

FANS 1/A Operations Manual

4.1.3.2 Industry Standards

The industry standards for ATS datalink systems are described in the latest versions of the following documents.

- ARINC 622: ATS Datalink Applications over ACARS Air-Ground Network (end-to-end).
- RTCA DO-258/EUROCAE ED-100: Interoperability Requirements for ATS Applications Using ARINC 622 Data Communications.
- ARINC 620: Datalink Ground System Standard and Interface Specification (ground-to-ground).
- ARINC 619: ACARS Protocols for Avionics End Systems (Airborne).
- ARINC 429: Mark 33 Digital Information Transfer System (DITS).

Note: It should be noted that some message parameters for avionics are categorized as 'option' data, but provide information useful for ATS operations.

4.1.4 Data Recording

The contents and timestamps of all messages will be recorded by the system. There will be a facility to retrieve, display and printout the recorded data.

4.1.5 System Performance Monitoring Tool

The Central Reporting Agencies (CRAs) perform safety assessments of datalink performance, and to support this function, in accordance with the FOM, ATSUs are required to produce monthly statistics of end-to-end system performance in daily operations. The system performance criteria from the FOM are reproduced at APPENDIX C. The system should have appropriate tools for monitoring and analysing the performance data for reporting to the appropriate monitoring agency.

4.2 DATALINK INITIATION CAPABILITY

4.2.1 AFN Logon Functions

The AFN logon functions provide the necessary information to enable ADS and CPDLC communications between the system and aircraft avionics systems for:

- Logon.
- Forwarding logon information to the next ATSU.

Note: Details of Datalink Initiation Capability (DLIC) functional capabilities are provided in Doc 9694 Part 2.

The required capacity for AFN logons will be determined from the operational requirements, such as estimated number of FANS aircraft at the peak hours and anticipated growth of FANS traffic.

The system must be capable of accepting or rejecting AFN logon requests.

The system will be linked with the FDPS to correlate the AFN logon data automatically with the aircraft flight plan.

The controller's workstation should be capable of displaying the following data:

- Address and version number of the aircraft applications, if required.
- Response from the aircraft with timestamp.
- Status of correlation of the aircraft with its stored flight plan.
- Indication of 'Acceptance' or 'Rejection' to the logon request from aircraft.

When an aircraft downlinks its supported applications and their version numbers in an FN-CON message, the ground system response must indicate whether or not it supports those version numbers.

The system must be capable of sending the Acceptance message or the Rejection message with reason, as appropriate.

4.2.2 Use of AIDC for Forwarding AFN Message

The ATS system should be capable of sending the FANS application message (FAN), in accordance with the ICD. When possible, the system should use the AIDC FAN message for address forwarding in preference to the AFN application.

4.3 CPDLC

4.3.1 General

The required capacity of the CPDLC function will be determined by taking account of the operational policy and procedures and the airspace characteristics, such as the number of FANS-capable aircraft, airspace size and number of waypoints, the communications necessary in ATS operations, and of the estimated future growth of datalink operations.

The system will be capable of processing the specified number of message exchanged with each of the aircraft.

Down-linked CPDLC messages will be displayed to controllers. Tools must be provided to allow simple and intuitive initiation of, or response to, CPDLC messages.

Note: The size of the free text field is limited to 80 characters (instead of 256) for some specific aircraft types.

CPDLC position reports should be used to display aircraft positions when no ADS report is available.

The system will have the capability of terminating CPDLC connection with the aircraft.

4.3.2 Transfer of CPDLC between ATC Sectors

The system will allow transfer of CPDLC between sectors of an ATSU without changing the data authority and with the same CPDLC link.

4.3.3 CPDLC Message Exchange Requirements

The system will be capable of handling the message set and the standardized free text messages defined in the FOM, as well as free text.

The system will allow controllers to review uplink messages prior to sending.

4.3.4 Message Handling Order

Messages will be handled in order of priority.

Messages with the same priority will be processed in the time order of receipt.

The controller will be alerted to unsuccessful receipt of the required response in the specified time or receipt of Message Assurance Failure (MAF).

4.3.5 Responses

The system will allow controllers to send any response messages linking with the reference number of the message received. The relationship between the message and its intent and the response requirement is defined in the FOM.

4.3.6 Message Closure

A CPDLC dialogue will not be closed until an appropriate closure response for that message with same reference number is received.

When the closure response message is sent, the dialogue is closed and the system will reject any further attempt to send a response message.

The capability of closing a CPDLC dialogue, independent of CPDLC closure message receipt, will be provided.

4.4 ADS

4.4.1 General

The capacity of the ADS function will be determined from the operational policy and procedures and the airspace characteristics, including number of FANS capable aircraft, periodic reporting rate, airspace size, waypoint event report frequency, usage of event and demand contracts, and projected traffic growth.

The system will be capable of initiating periodic, event and demand contracts.

The system will be able to support a demand, an event and a periodic contract simultaneously with each aircraft.

The system will apply validation checks to incoming data by reference to flight plan data in relation to time, altitude, direction and position.

The system will be capable of processing ADS reports to display aircraft positions, tracks and altitude. Between ADS reports, aircraft positions will be extrapolated and displayed automatically at specified intervals.

The datalink system should have the capability of supporting 30NM lateral and 30NM longitudinal distance based separation standards.

Air and earth reference data of ADS reports will be provided for controllers if required.

The types of ADS contract are described at 5.3.1 ADS.

4.4.2 Message Handling

ADS messages will be processed by the system in the following order:

1. ADS emergency mode.
2. Demand/event reports.
3. Periodic report.

Within these categories, messages will be handled in the order received.

The following errors will be notified to controllers:

- Message validation error.
- Message sequence error detected with time stamp.
- Time-out of ADS report in response to request.
- Periodic and waypoint event report failure.

4.5 AIDC

4.5.1 General

General descriptions of AIDC applications, requirements, functional capabilities, and message contents are provided in the latest version of the ICD.

The AIDC application exchanges ATC coordination information between ATSU's.

Bilateral agreements between ATSU's are necessary to determine the operational and system requirements for both ATSU's, and should be made before developing the system. These agreements should cover:

- The ICD to be applied – Asia/Pacific or other ICD.
- message set to be used.
- usage of messages (e.g. timing of transmission).

The AIDC application requires that:

- messages are generated and sent in time-ordered sequence.
- messages are delivered in the order in which they are sent.

When an ATSU queues received messages, messages with the highest urgency type will be placed at the beginning of the queue. Messages will be assigned one of the following urgency attributes:

- Normal.

- Urgent.
- Distress.

The time used in the AIDC application will be accurate to within 1 second of UTC.

A timestamp will be generated when the message is dispatched and will consist of the date (YYMMDD) and time (HHMMSS).

Where an AIDC message is linked to a previously sent message, the message will contain reference information, including the ID of the referenced message.

4.5.2 Asia/Pacific Interface Control Document (ICD)

The Asia Pacific ICD for AIDC provides the standardized procedures for inter-facility message exchanges.

(The purpose of the ICD is to ensure that inter-facility message exchanges between ATSU equipped with automated ATS systems in the Asia/Pacific Region are harmonized to a common standard.)

Until ATN becomes available, the engineering details needed to implement the exchange of messages described in Appendix A of the ICD will need to be agreed to bilaterally.

4.5.3 Message Header

Every message will contain an AFTN header. The AFTN IA-5 message header, including the use of the Optional Data Field defined in Annex 10, will be employed for the exchange of data. AFTN priority indicator FF will normally be used for all data exchanges.

A message header consists of the optional data field (ODF), addressing, message/data identification number, reference information, time stamp and cyclic redundancy check (CRC).

4.5.4 ATS Coordination Messages

AIDC provides the means by which data is exchanged between and within ATSUs for the notification of flights approaching FIR boundary, the coordination of boundary crossing conditions and the transfer of ATC services.

AIDC messages are also used to exchange emergency, track definition, and application management information as well as for transfer of surveillance data.

4.5.5 Detailed Information Provided in ICD

The appendices to the ICD describe:

- ATS coordination messages (Appendix A).

- Error codes (Appendix B).
- ATM application naming conventions (Appendix C).
- Implementation Guidance Material – IGM (Appendix D).
- Relationship to ICAO AIDC messages (Appendix E).

4.5.6 Performance Requirements

The performance requirements for the trip time of messages need to be specified and agreed to with neighbouring ATSUs to ensure effective use of AIDC. Recommended performance figures are specified in Appendix D of the ICD.

The methodology for monitoring AIDC performance is provided in Appendix A of the Guidance Material for End-to-end Safety and Performance Monitoring of ATS Datalink Systems in the Asia/Pacific Region.

CHAPTER 5 SPECIFICATION

The development of the specification should, wherever possible, be a team effort, with operational and technical personnel working together to achieve the optimum result. System specifications should be based primarily on operational requirements; the technical specifications should be framed to support those requirements.

In developing a specification for any technical system, it is important to achieve the right level of detail. Too little detail leaves the purchaser at the mercy of potential suppliers, while too much may preclude suppliers from offering very suitable equipment. In general, it is probably appropriate to specify requirements in great detail only where those requirements are essential to the operation, and otherwise to leave the supplier a reasonable amount of freedom. An off-the-shelf system can be expected to be less expensive than one that is custom-designed.

It is also important to get the specification right. Proposals will be priced on the specification, and any changes required later, particularly after the contract is signed, will be costly in terms of price and completion time.

This section on specification covers the system configuration, its interfaces with other systems, its functionality, the operator interface, system capacity, and recording and data analysis.

5.1 SYSTEM CONFIGURATION

The system configuration depends upon the operational environment. In specifying the configuration, a number of issues must be considered:

- Is it to be a stand-alone ADS/CPDLC/AIDC system, is it to be part of an integrated system or is it to be interfaced with a separate ATM system?
- How many sectors are required?
- How many workstations are required per sector? If more than one, why?
- What contingency configuration is required?
- Is complete duplication of the system required?
- What are the requirements for main/standby computers and independent contingency workstations?
- Will there be duplication of communications bearers? If so, which ones?
- Assuming the normal operational configuration is one workstation per sector, how many contingency workstations are required?

5.2 INTERFACES

The System must have a number of interfaces to send and receive data; some of these are essential, others may be useful or just nice to have. This section concentrates on the essential and the useful.

5.2.1 Datalink Service Provider

In the current FANS 1/A environment, ADS and CPDLC messages are passed between aircraft and the System using the ACARS data messaging system. ACARS was developed by the DSPs to pass information between the airline operating centre (AOC) and the aircraft. ADS and CPDLC required an air-ground datalink and, in the absence of the Aeronautical Telecommunication Network (ATN), the ACARS system was used.

Access to the ACARS datalink is available only from the DSPs; ARINC and SITA are the major DSPs; they provide global coverage and complete management of the signal between the ATSU and the aircraft, including selection of most appropriate datalink path (VHF, satellite or HF). There are also some national or regional DSPs, such as AVICOM Japan.

It is essential therefore to specify the appropriate interface port(s) to connect to the chosen DSP. This is typically an RS232 serial port, but the exact requirement should be confirmed with the DSP.

5.2.2 ATN

It is intended that the ADS and CPDLC functions will eventually be carried by the ATN. The purpose of the ATN is to “provide data communication services and application entities in support of the delivery of air traffic services (ATS) to aircraft; the exchange of ATS information between ATS units; and other applications such as aeronautical operational control (AOC) and aeronautical administrative communication (AAC).” [Annex 10, Vol III, 3.3]

It is important, therefore, that any new system should either include provisions for, or have a defined upgrade path to provide, interfacing with the ATN.

ICAO Doc 9705 - Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) is the appropriate source of interface data for the ATN.

At present, the ATN is under development and trials are being carried out in several ICAO Regions.

5.2.3 AFTN/AMHS

The AFTN is currently the carrier for ground-ground messaging between ATC units and carries AIDC messages in the FANS 1/A environment. The AHMS (Aeronautical Message Handling System) is the ground-ground messaging

application of the ATN. The AMHS is also referred to as the ATSMHS (ATS Message Handling System).

AIDC messages will be passed via the AFTN until the ATN is operational. However, AFTN/AMHS gateways will increasingly be used to provide a transition between the AFTN and ATN. These gateways transpose AFTN messages into AMHS format and vice versa.

Any new system should include at least one AFTN/AMHS gateway. AIDC messages generated in AMHS structure can then be transmitted via the AFTN and incoming messages from the AFTN will be transposed to AMHS structure. After the ATN becomes operational and the AFTN is no longer used, the gateway can be removed.

5.2.4 ATS systems

In many cases, interfaces to other ATS systems will be necessary. This may be because an ADS/CPDLC system will use the flight data or other processing capability of another system or because the new system will be directly connected to another system.

5.2.4.1 Flight Data Processing System

Where an ADS/CPDLC system is to rely on an existing system to provide flight data, the interface required will depend on the data to be passed. The ADS/CPDLC system may have no flight data processing capability and merely require flight plan information for identification purposes, or it may have some capability to up-date flight plans received from the other system and return the up-dated information.

In either case, the interface may need to transform data formats between the 2 systems. It is therefore essential that the data formats used by the existing system are detailed in the specification so that they are allowed for in proposals; otherwise, costly contract variations may be required.

5.2.4.2 Radar Data Processing System

Data imported from a separate radar data processing system will take the form of track data or possibly plot data. As with interfaces for flight data, it is most important to detail the radar data formats in the specification.

If ADS data is to be exported to a separate radar data processing system or display system, the formats required by those systems also must be detailed.

5.2.4.3 Direct Connection between Systems

When a full system (with FDPS and perhaps RDPS as well as ADS/CPDLC/AIDC) is to be connected directly to an existing system for

full data interchange, details of all the data formats of the existing system should be included in the specification.

5.2.5 Radar Data

If the System is to receive direct radar feeds from existing radars, the output data format of each radar must be detailed.

Most new systems are designed around the ASTERIX surveillance data formats; specifying ASTERIX where possible will allow the greatest flexibility for the future. The ASTERIX Standard was adopted as the ICD for surveillance data exchange for the Asia/Pacific Region in 1998. Information on ASTERIX may be found at:

http://www.eurocontrol.int/asterix/public/subsite_homepage/homepage.html

The “Regional Supplement to the ASTERIX Interface Control Document for the Asia/Pac Region” gives details of location-specific ASTERIX coding.

Inputs from military radars may be non-standard or require additional processing; any available details should be included.

5.2.6 ADS B Data

Where ADS B data is available or anticipated, the system should be capable of accepting and processing such data.

5.2.7 Meteorological Data

Many modern systems make provision for the use of meteorological data for updating predicted waypoint times in near-real time. However, this type of prediction may require very large amounts of data and may not be justified if experience shows that weather variations have very little effect on the routes concerned or where the weather patterns are such that occasional manual input would suffice.

If there is a requirement for regular automatic data input, the available sources of data should be investigated and the appropriate formats should be specified.

5.3 FUNCTIONALITY

This section covers the core applications of the system, ADS, CPDLC and AIDC, and their supporting functions, AFN and ACF.

5.3.1 ADS

ADS is a means of surveillance in which an aircraft reports its current position, intent and other pertinent information via the datalink function to an ATSU.

ADS is detailed in ARINC 745-2.

The ADS reporting rate and the types of data to report are determined by ADS contract requests from an ATSU. An aircraft can report to up to four ATSUs simultaneously.

There are three types of ADS contract: the periodic contract, the event contract and the demand (“one-shot”) contract.

5.3.1.1 Periodic Contract

The ATSU sets up a periodic contract with the aircraft to obtain regular position reports; the contract specifies to the aircraft the reporting rate, any optional data groups be added to the basic ADS report, and the frequency at which the optional groups are to be included in the reports.

Only one periodic contract can be established between an ATSU end system and a particular aircraft at any one time. The periodic contract normally remains in effect until the contract is cancelled by the ATSU.

The system must be capable of pre-defining the reporting rate as a system parameter and of allowing the controller to change the rate, on a case by case basis, to meet operational requirements.

The system must also allow the controller to include any of the permissible additional data groups in a periodic contract request.

Some systems have the capability of automatically changing the reporting rate from one area to another; however, this could increase system cost and complexity.

5.3.1.2 Event Contract

An event contract specifies a request for reports whenever a defined ‘event’ occurs. Only one event contract can be established between a ground system and a particular aircraft at any one time; however, the event contract can contain multiple event types. There are four event types.

The **Vertical Rate Change Event** is triggered when the aircraft’s vertical rate is either less than or greater than a parameter defined in the contract.

The **Lateral Deviation Change Event** is triggered when the aircraft’s actual position exceeds a lateral distance parameter from the aircraft’s expected position on the active flight plan in the FMC.

The **Altitude Range Change Event** is triggered when the aircraft’s altitude exceeds the altitude ceiling or floor defined in the contract by the ground system.

Once a vertical rate, lateral deviation or altitude range event trigger has occurred, a recurrence of this event no longer triggers an event report. If required, a new event contract must be initiated each time one of these specific events occurs.

The **Waypoint Change Event** is triggered by a change to the next or the next-plus-one waypoints. Such a change normally occurs due to routine waypoint sequencing. However, it will also be triggered by occurrences such as a change to a non-ATS waypoint entered by the pilot for operational reasons, or execution of a new route affecting the next or next-plus-one waypoints. Unlike the other event contracts, the waypoint change event trigger remains in effect for all waypoint changes.

Once an event contract has been established, it remains in effect until the specific event requests are fulfilled, or it is cancelled by the ground system.

The system must be capable of pre-defining the event trigger parameters and of allowing the controller to change the event parameters as required.

5.3.1.3 Demand Contract

The demand contract is a “one-off” request from the ground system for an ADS report containing specific data as defined in the request. A demand contract can be requested by the ground system at any time. The demand contract request does not affect any existing contracts.

The system must allow the controller to initiate a demand contract, including optional data fields.

5.3.1.4 Emergency Mode

The emergency mode can only be activated by the pilot and is normally cancelled by the pilot. While it is possible for a ground system to cancel the emergency mode status, most ground systems do not have this capability; however, some ground systems allow the controller to modify the “display” of the emergency mode status.

The system must recognise the emergency flag and display the emergency status to the controller.

5.3.2 CPDLC

CPDLC provides a two-way message system between controller and pilot. It comprises a number of pre-defined up-link and down-link messages, some of which are complete in themselves, while others require data (such as time,

flight level, etc) to be added. There are also two free-text messages available in each direction, one reserved for emergency use.

To send a message, the controller selects the required message and enters any required data. (Options for selecting messages and entering data are discussed below under Human-Machine Interface.) The system then automatically codes the message in bit-oriented format and presents it for transmission.

On reception of a down-link message, the CPDLC application decodes the message and presents it to the controller.

The current message set is detailed in the FOM, and the system must provide the complete up-link message set and be capable of accepting and decoding the complete down-link message set.

Some message sequences require “closure”:

- A message requiring a response remains open until a referenced response is received.
- A message is closed when either a response is not technically required, or after a referenced response other than STANDBY or REQUEST DEFERRED has been received.

The system must manage message closure protocols in accordance with the requirements of the FOM.

5.3.3 ACF

ADS and CPDLC both operate on bit-oriented data, while ACARS is character-oriented. The ACARS Convergence Function (ACF) converts the bit-oriented data of ADS and CPDLC to the character-oriented data used by ACARS, and vice versa.

If the system is to operate over ACARS, the ACF must be specified as an essential requirement.

(The ACF is not required where the ATN is the carrier.)

5.3.4 AFN

The AFN function provides the transfer of information required to support the initiation of datalink connectivity between an aircraft and an ATSU. The AFN is a character-oriented application.

Because it is essential to ADS and CPDLC operation over ACARS, the AFN function as detailed in ARINC 622-4 must be a requirement of the system specification.

5.3.5 AIDC

The AIDC application supports information exchanges for notification, coordination, and the transfer of communications and control functions between automated ATS systems located at different ATSUs.

The AIDC message set is defined in the ICD. This message set was based on ICAO agreed methods and messages wherever possible; elsewhere, new messages used existing ICAO field definitions to the extent possible.

5.4 OPERATOR INTERFACE

5.4.1 Human Factors

Human factors play a major part in the success or failure of a system to meet its operational objectives. A system that is uncomfortable to use will lead to controller dissatisfaction, which as controllers are an essential part of the overall system, can only degrade the overall system performance.

Displays and keyboards that are poorly designed from a human factors aspect will be inefficient and may cause actual harm to the users. Bad display design can affect the eyes and bad keyboard design may result in occupational overuse syndrome (repetitive strain injury). The human factors implications of the system specification should be very carefully considered, and it may be appropriate to get specialist advice.

5.4.2 Displays

One or more displays are required to handle the ADS, CPDLC and AIDC messages. Many systems incorporate message handling in the situation display.

Modern displays use LCD technology and may be as large as 600 x 600mm, with typical resolution of 2048 x 2048 pixels. Smaller displays may be more appropriate for some uses, particularly if there are 2 displays at a controller position: a second display is often used for flight data handling. However, the arrangement of displays will largely depend on the extent to which the new system is to be integrated with existing systems.

While colour displays offer great advantages in differentiating between different categories of data, the choice of colours for the various categories can be very contentious. It is essential that colour allocation is not arbitrarily decided, but is based upon sound human factors principles. Inappropriate colour choices can contribute to fatigue, confusion and errors. To avoid these problems, a human factors expert should be engaged to advise on the use of colour.

Different symbols should be used for radar tracks, ADS-B tracks, ADS-C tracks and tracks generated from flight plan information. The track symbol should be that of the source of the highest quality information. At the current stage of development of ADS-B systems, radar is generally accepted as the best surveillance data, followed by ADS-B and then by ADS-C. Flight plan tracks are the lowest quality.

The status of the CPDLC connection is important information for the controller and is best displayed in the track label.

5.4.3 Message Handling

Message handling for ADS, CPDLC and AIDC messages is usually achieved by some form of menu access for generating messages and by pop-up windows for replying to incoming messages. Most systems now offer access via the track label.

For CPDLC, there are two elements to generating most messages: selection of the specific message and entry of necessary data. The message selection should be simple: there are about 180 uplink messages available. Some systems present a selection of appropriate messages – for example, by offering only height-related messages if the height field in the track label is selected. ADS contract messages are more simple and infrequently required, so that a simple menu-type operation is normally adequate. AIDC messages can usually be generated automatically from flight plan data.

If a particular message handling method is required, it should be clearly stated in the specification.

The language for all menus and message sets should be English: English is the de facto language for radiotelephony within the Asia-Pacific Region. While it may seem attractive for menus and CPDLC messages to be displayed in a local language, this will inevitably lead to loss of English language proficiency and so will work against the new ICAO language proficiency provisions in Annexes 1, 6, 10 and 11. These provisions require that from March 2008, pilots, aeronautical station (radio) operators and air traffic controllers shall demonstrate the ability to speak and understand the language used for radiotelephony communications to specified levels.

5.4.4 Input Devices

The controller input devices include the text input device and the pointing device.

The text input device is normally a keyboard and there are various types of keyboard (standard, ergonomic, etc). The type should be specified if it is considered important; however, it is worth noting that controllers do not have to

input large amounts of text in an ADS/CPDLC system. Touch panels may be offered instead of keyboards.

The mouse is the most common and probably most flexible pointing device; others include the track-ball and the light pen. It is difficult to locate a track-ball and keyboard so that they are well-placed for both left- and right-handed people, and light pens have been poorly received by many controllers.

Wireless connections for the input devices will reduce the clutter on the workstation working surface and allow more freedom of movement for the pointing devices. However, electro-magnetic compatibility with nearby equipment must be carefully considered.

5.5 CONTROLLER TOOLS

Controller tools include such items as:

- Conflict probe
- Temporary maps
- Bearing-distance lines
- Velocity vectors
- Label overlap avoidance

5.5.1 Conflict Probe

Conflict Probe is a tool to determine whether a proposed flight plan will come into conflict with another during a specified period.

The Conflict Probe is normally initiated by the controller for a particular aircraft. The probe compares the proposed trajectory with the current planned trajectories of other aircraft information and displays the position and time of calculated conflicts to the controller. The period covered by the probe is typically fairly long (up to several hours), as the main use of Conflict Probe is when a routing change is proposed under a flexible track regime.

Conflict Probe is a very complex function, requiring considerable computer power, and consequentially can be expected to be expensive.

5.5.2 Temporary Maps

Temporary maps allow controllers to depict on the display areas of interest on a temporary basis. Temporary maps should be simple both to construct – a few straight lines is usually adequate – and to switch on or off on the display.

5.5.3 Bearing-Distance Line

As its name suggests, a bearing-distance line allows a controller to measure the bearing and distance between 2 points on a display. The points might be an aircraft track symbol and a reporting point or 2 aircraft track symbols.

Some systems allow one or both ends of the line to lock on to an aircraft track symbol, so that the bearing and distance information displayed is updated as the aircraft move.

Multiple bearing distance lines, if available, can be useful.

5.5.4 Velocity Vectors

Velocity vectors display a vector from the track symbol showing the calculated position of the track after a specific time. The time is normally preset to a default value (typically 2 minutes); most systems allow the controller to set a different value.

Some systems also allow velocity vectors to be shown for all tracks or for a selected track only.

5.5.5 Label Overlap Avoidance

Label overlap avoidance allows the track labels to be moved to avoid labels overlapping one another. This is done by rotating some labels to new positions relative to the track symbol or by changing the distance of some labels from their symbols. The process is normally automatic, but should allow the controller to set selected labels to a preferred position.

5.6 SYSTEM CAPACITY

The required system capacity is directly related to the number of ADS, CPDLC and AIDC messages, the number of radar tracks, the number of active flight plans, the number of workstations and so on. These, in turn, are directly related to the volume of traffic, particularly the peak traffic volume.

The system capacity is normally expressed as the number of active flight plans that the system can handle at one time; in this context, “active” means that the system is using or processing the flight plan information in some way.

It is clearly important that the system capacity should allow for traffic growth over the projected life of the system, which for modern systems is typically 5 to 7 years between major upgrades or replacement. The anticipated growth should therefore be carefully assessed using the best projections available, and should allow for daily and seasonal traffic peaks.

However, it is also important not to set the capacity requirement too high, as this will almost certainly result in increased cost.

Some growth rates over those periods are shown below to give an indication of future capacity requirements based on current traffic:

Anticipated Annual Growth	Total Growth over		
	5 years	6 years	7 years
5%	28%	34%	41%
7.5%	44%	54%	66%
10%	61%	77%	95%

5.7 RECORDING AND DATA ANALYSIS

The system should record all incoming and outgoing ADS, CPDLC and AIDC messages for use in incident and accident investigations. It is imperative that all recordings are time-stamped. Messages are typically recorded onto a tape cartridge or DVD, and the system should allow change-over of the cartridge or DVD with no interruption to the recording.

Annex 10 Vol II and Annex 11 require communications, including AIDC and CPDLC, to be recorded and the recordings to be retained for at least 30 days for accident/incident investigation purposes. Chapter 3 of the FOM details some specific recording requirements for both safety investigation and performance monitoring.

The recording system should allow replaying of the situation and identification of messages were sent or received by the system.

Provision should also be made for recording data for use by the agencies monitoring RNP, RVSM and datalink performance. These are the Safety Monitoring Agency (SMA), the Regional Monitoring Agency (RMA) and the Central Reporting Agency (CRA) respectively. Generally, the data required by RMAs and SMAs is captured by the FDPS.

To meet CRA requirements, the specification should include a requirement for datalink performance monitoring tools and analysis software. The analysis software should, at the least, be capable of extracting time-stamps, addressees and message types from all incoming and outgoing messages.

The table below summarises the FOM datalink monitoring requirements for ANSPs.

Requirements	Monitor/Record
Operational Procedures	Time stamped ATS messages with identification and reference numbers
	Message Assurance
	Anomaly event report
Performance	End-system availability
	Transit times
Safety (i.e. operational, performance and interoperability requirements which are used to mitigate the effect of a failure condition)	Time stamped ATS messages with identification and reference numbers/MAS
	Anomaly event reports
Interoperability	Time stamped ATS messages with identification and reference numbers/MAS

APPENDIX A GLOSSARY

ACARS	Aircraft Communications Addressing and Reporting System
ACAS	Aircraft Collision Avoidance System (ICAO)
ADS	Automatic Dependent Surveillance
AEEC	Airline Electronic Engineering Committee
AFN	ATS Facilities Notification
AFTN	Aeronautical Fixed Telecommunication Network
AIDC	ATC Inter-Facility Data Communications
AIP	Aeronautical Information Publication
AMHS	Aeronautical Message Handling System
ANSP	Air Navigation Service Provider
AOC	Airline Operational Communications
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
ARINC	Aeronautical Radio Incorporated
ATC	Air Traffic Control
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Services
ATSMHS	ATS Message Handling System
ATSU	ATS unit
AVICOM	AVICOM Japan Co. LTD
CAA	Civil Aviation Authority
CNS	Communications, Navigation, Surveillance
CPDLC	Controller Pilot Data Link Communications
CRA	Central Reporting Agency (for datalink)
CRC	Cyclic Redundancy Check
DL	Downlink message
DSP	Datalink Service Provider
EUROCAE	European Organization for Civil Aviation Equipment
FANS	Future Air Navigation System
FIR	Flight Information Region
FIT	FANS Interoperability Team (IPACG, ISPACG) FANS Implementation Team (FIT-BOB, FIT-SEA)
FMC	Flight Management Computer
FMS	Flight Management System
GES	Ground Earth Station (satellite)
GPS	Global Positioning System (USA)
HF	High Frequency (3-30 MHz)
IATA	International Air Transport Association

ICAO	International Civil Aviation Organisation
IFATCA	International Federation of Air Traffic Controllers Associations
IFALPA	International Federation of Air Line Pilots' Associations
IPACG	Informal Pacific ATC Coordinating Group
ISPACG	Informal South Pacific ATS Coordinating Group
MAS	Message Assurance (data message)
MCDU	Multipurpose Control Display Unit (ACARS & FMC)
MU	Management Unit (ACARS)
NDA	Next Data Authority
NOTAM	Notice To AirMen
RASMAG	Regional Airspace Safety Monitoring Advisory Group
RMA	Regional Monitoring Agency (for RVSM)
RNP	Required Navigation Performance
RTCA	RTCA Inc.
RVSM	Reduced Vertical Separation Minima
SATCOM	Satellite Communication
SATVOICE	Satellite Voice Communication
SITA	Société Internationale de Télécommunications Aéronautiques
SMA	Safety Monitoring Agency (for RNP)
SR&O	System Requirements and Objectives (FANS-1 document)
TCAS	Traffic Alert and Collision Avoidance System (USA)
TMU	Traffic Management Unit
UL	Uplink message
VHF	Very High Frequency (30-300 MHz)

APPENDIX B REFERENCES

Annex 10, Volume III, Communication Systems		ICAO
Procedures for Air Navigation Services, Air Traffic Management	Doc 4444	ICAO
Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN)	Doc 9750	ICAO
Basic Air Navigation Plan – Asia and Pacific Regions	Doc 9673	ICAO
Manual on Airspace Planning Methodology for the Determination of Separation Minima	Doc 9689	ICAO
Manual of Air Traffic Services Data Link Applications	Doc 9694	ICAO
Safety Management Manual	Doc 9859	ICAO
Asia/Pacific Regional Plan for the new CNS/ATM Systems		ICAO Asia Pacific Office
Regional Supplement to the ASTERIX Interface Control Document (ICD) for the Asia/Pac Region		ICAO Asia Pacific Office
Asia/Pacific Regional Interface Control Document (ICD) for ATS Inter-facility Data Communications (AIDC), version 2		ICAO Asia Pacific Office
Guidance Material for End-to-End Safety and Performance Monitoring of ATS Datalink Systems in the Asia Pacific Region		ICAO Asia Pacific Office
FANS 1/A Operations Manual		
Interoperability Requirements for ATS Applications using ARINC 622 Data Communications	DO-258A / ED-100A	RTCA and EUROCAE
Air-Ground Character-Oriented Protocol Specification	618-5	ARINC
Data Link Ground Systems Standard and Interface Specification (DGSS/IS)	620-5	ARINC
ATS Data Link Applications Over ACARS Air-Ground Network	622-4	ARINC
Aircraft Communications Addressing Reporting System (ACARS)	724B-5	ARINC
Air Traffic Services Systems Requirements & Objectives (ATS SR&O)		Boeing

APPENDIX C PERFORMANCE CRITERIA

Criteria	Definition	Values
Performance	End-to-end round trip time for uplinks. (from sending of the uplink until reception of the MAS)	Round trip time of 2 minutes, 95% of messages. Round trip time of 6 minutes, 99% of messages.
	End-to-end one way time for downlinks. (comparison of message time stamp and receipt time)	One way time of 1 minute, 95% of messages. One way time of 3 minutes, 99% of messages
	Uplink messages only: Undelivered messages will be determined by: • Message assurance failure is received. After trying both VHF and SATCOM. Depending on reason code received, the message might, in fact, have reached the aircraft. • No message assurance or flight crew response is received by ATSU after 900 seconds	Less than 1% of all attempted messages undelivered
Availability	The ability of the network data link service to perform a required function under given conditions at a given time:	99.9%
	The maximum allowed time of continuous unavailability or downtime should be declared (MTTR)*	TBD
Reliability	The ability of a data link application/system to perform a required function under given conditions for a given time interval: it can be expressed in MTBF (Mean Time Between Failure) *	TBD
Integrity	The probability of an undetected failure, event or occurrence within a given time interval.	10 ⁻⁶ /hour

* Availability = $MTBF \times 100 / (MTBF + MTTR)$

Note: RTCA SC189/EUROCAE WG 53 defines the performance requirements for specific operational environments.

**AGENDA ITEM 7: REVIEW DEVELOPMENTS
RELATING TO CNS/ATM
IMPLEMENTATION**

Agenda Item 7: Review developments relating to CNS/ATM implementation

Performance Based Navigation (PBN)

7.1 The meeting was presented with information on the work done by the ICAO Required Navigation Performance and Special Operational Requirements Study Group (RNPSORSG) as well as ICAO plans for implementation of performance based navigation (PBN) based on that work. Details of the presentation have been included as **Appendix A** to the Report on Agenda Item 7. A revised ICAO Doc 9613, *Performance Based Navigation Manual* has been developed and is available as a final draft on the ICAO-NET. State letter AN/11/45-07/22, *Guidance material for the issuance of performance based navigation (PBN) operational approvals*, dated 27 April 2007 is also posted on the ICAO-NET. This State letter provides the globally harmonized navigation specifications that can be used as the basis for operational approvals for PBN operations. Provisions are under development by the responsible ICAO groups and panels to align the Annexes and PANS OPS with the PBN Manual.

7.2 A paper would be presented by the Secretariat to the 36th Assembly of ICAO in September 2007 proposing a resolution to be adopted by the Assembly setting global goals for implementation of PBN. Nine "Introduction to PBN" Seminars will be conducted over the next year in different ICAO regions to familiarize States and stakeholders with the PBN concept and how to implement PBN. The next seminars are 11-14 September 2007 in Bangkok, Thailand and 17-21 September 2007 in New Delhi, India. Maximum participation by all stakeholders in PBN implementation is encouraged. A Web-based PBN training course has been developed by EUROCONTROL for ICAO and can be found on the ICAO PBN website www.icao.int/pbn. Completion of this training is recommended prior to attendance at the Introduction to PBN Seminars.

7.3 The meeting considered that implementation of PBN in the region was very important and would yield immediate efficiency and safety benefits. On consideration of the information provided and in order to ensure timely progress in PBN planning and implementation in the region, the meeting agreed to the following draft Conclusions for consideration by CNS/MET/SG/11 and APANPIRG/18:

Draft Conclusion 17/16 – Establishment of a Performance Based Navigation Task Force

That a PBN Task Force, with terms of reference as outlined in **Appendix B** to the ATM/AIS/SAR/SG/17 Report on Agenda Item 7, be established to develop a PBN implementation plan for the Asia- Pacific Region and address other regional PBN implementation issues.

Draft Conclusion 17/17 – Development of State PBN Implementation Plans

That the Regional Office encourage States to begin development of their State PBN implementation plans in harmony with the development of the Asia-Pacific Regional PBN implementation plan being coordinated by the Asia/Pacific PBN Task Force for submission to APANPIRG/19 (2008) and.

7.4 For PBN to become widely implemented in terminal and approach areas and to achieve optimum benefits to users, it was anticipated that considerable effort would need to be put into planning and identifying what airspace measures could be introduced and the level of air navigation service required. This would require the Task Force to have membership drawn from the various disciplines involved, such as flight operations, air navigation service providers, safety

management, industry partners both technical and operational, etc. Also, implementation based on a State by State basis could also raise new and complex problems of standardization.

7.5 In discussions on the implementation of PBN from an ATM perspective, comments were made concerning the need for more information and understanding of how application of the PBN would impact upon the ATM system requirements and flight operations and what changes would need to be made to airspaces to gain PBN based benefits. States were encouraged to attend the PBN seminars as discussed in paragraph 7.2 above to assist in their understanding of the issues involved.

7.6 In the implementation of RNP and RVSM, major difficulties were being experienced in this region setting up and operating the ATM safety management arrangements for contiguous airspaces involving several States, especially in terms of airspace safety monitoring and performing safety assessments. In the international enroute airspace in this region, considerable effort and progress has been made to establish the safety oversight mechanisms through the regional monitoring agencies for application of vertical and horizontal separation. Still there were obstacles to implementation arising from funding issues relating to who and how to pay for the international safety services.

7.7 In considering introducing more precise PBN standards in the terminal and approach airspaces that would support reduction in route spacing and introduction of more flexible and efficient routing arrangements, this would require an appropriate safety basis for implementation. In this regard, such activities would be conducted mainly in sovereign airspaces where individual States would be responsible for safety management matters. Also, it would be necessary for appropriate levels of air navigation services to be provided, and radar would be the primary means of separation. To maximize benefits of using PBN for air traffic separation and capacity enhancement, States would need to be able to conduct complex airspace and ATC system analysis and conduct safety assessments and related activities.

7.8 Experience gained in implementation of airspace changes requiring safety assessments to be performed such as under RVSM and RNP has demonstrated the complexities involved in undertaking such work and highlighted the resource limitations of many States in this area. Implementation of PBN with related changes to airspaces, procedures and separation, etc would be likely to place new and challenging requirements on States who would require considerable assistance and guidance through seminars, workshops and guidance material.

7.9 In this regard, recalling that one of the main requirements to operate aircraft in RNP and RVSM environments is State approval of operators and aircraft, the meeting considered that this would also be the case with PBN approvals. In this regard, the provision of model approval documentation and gaining the technical expertise to manage the process was an important consideration. To facilitate progress in this specific area, the meeting agreed to the following draft Conclusion:

Draft Conclusion 17/18 – Development of model PBN approvals documentation

That, recognizing that the availability of model PBN approvals documentation was likely to encourage standardization and assist in accelerating the widespread implementation of PBN, ICAO be invited to develop and promulgate model documentation suitable for adaptation by State regulatory authorities in implementing State aircrew and airframe approvals processes for PBN.

7.10 The United States informed the meeting about the substantial work programme that had already commenced in the USA in relation to PBN implementation. The PBN concept and associated benefits were viewed very favorably and the United States was already adapting to the new arrangements. Detailed information including training documentation is available from the FAA at the following web address:

http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/aaim/organizations/rnav_rnp/

Update on the development of the ICAO Five Letter Name Codes and Route Designators Database (ICARD)

7.11 The meeting was informed on developments to expand the use of the ICAO Five-Letter Name-Codes and Route Designators Database (ICARD) Internet based application. It was recalled that since October 1995, the ICAO European and North Atlantic (EUR/NAT) Office and EUROCONTROL had been working together to develop and maintain a common database of facilities and services required for international air navigation within the EUR Region. In February 1998, the first application on the EUROCONTROL website was developed to support the allocation process of Five-Letter Name-Codes (5LNC) used for significant points on ATS routes.

7.12 At present, the coordination of 5LNC among States and ICAO Regional Offices was a very complex and time-consuming process using a paper-based methodology. The advent of the Internet has made itself a suitable tool to address the 5LNC management process from one central and global database.

7.13 The web-based ICARD system would allow end-users to electronically view, search, reserve, allocate, modify and receive a confirmation of the assigned code. If the user was an authorized member State user or an ICAO Regional Officer, the user can search, reserve, allocate and modify 5LNC from the reserve list of 140,000 codes while ensuring worldwide uniqueness, as well as browse the entire assigned 5LNC database. The web-based ICARD system allows users to visualize geographically all 5LNC.

7.14 One of the important aspects of ICARD was the resolution of the existing duplicate 5LNC for en-route. In order to eliminate the future issuance of duplicate 5LNC, these would be readily identified by the electronic processes of the database. The acceptance of the ICARD system by both States and ICAO Regional Offices worldwide would assist in resolving this matter.

7.15 In light of this, ICAO EUR/NAT Office was willing to assist in expanding the application of ICARD outside of the EUR/NAT Region and the ICAO Middle East Region, who had also implemented ICARD in September 2005. During late 2006, the Asia/Pacific Regional Office was invited to join ICARD and selected a small group of States to join the initial phase of a trial implementation in the Asia/Pacific Region.

7.16 From the past records of activity in requesting 5LNC and the size of FIRs involved, the Asia/Pacific Office selected Australia, Japan, Malaysia and New Zealand to participate in the initial phase of trial operation of ICARD and the trial commenced during early 2007.

7.17 On completion of the trial implementation by the nominated States, other States would be progressively invited by the Regional Office to register in the ICARD system and to begin using it. It was anticipated that the system could be made fully available to all interested States for implementation in late 2007.

7.18 The meeting noted the recent developments and that agreement between ICAO and EUROCONTROL had been reached regarding the use of ICARD on a global basis. The ICAO EUR/NAT Office would also assist the ICAO Western and Central African (WACAF) and Eastern and Southern African (ESAF) Offices in the implementation of ICARD.

7.19 The meeting recognized the considerable benefits of using the ICARD system and noted the intended expansion by ICAO to serve as a global system. All States in the Asia/Pacific Region were encouraged to join the operation at the earliest opportunity, noting that arrangements for appropriate training would need to be put in place by the Regional Office as resources permitted. In support of this initiative, the meeting agreed to the following draft Conclusion

Draft Conclusion 17/19 – Endorsement of the Use of ICARD System

That, so as to facilitate and enhance the management of the five-letter name-codes in the Asia and Pacific Region:

- a) States endorse the use of the ICAO Five-Letter Name Codes and Route Designators (ICARD) database, initially developed by the EUR/NAT Office and Eurocontrol; and
- b) the Regional Office provide all necessary guidelines to facilitate the regional implementation of ICARD.

Proposed amendment to the ICAO Flight Plan

7.20 The meeting was presented with a State Letter containing a proposal developed by the Secretariat, assisted by the ICAO Flight Plan Study Group (FPLSG), for a comprehensive amendment of the flight plan provisions of the PANS-ATM intended for implementation in 2010. At an early stage in its work the FPLSG study group recognized that in order to abide by the terms of reference, the resulting amendment proposal would need to address recent developments within the field of air traffic management, for example RVSM and PBN, while at the same time maintaining a high degree of commonality with the existing flight plan format.

7.21 During the development of the amendment proposal, the FPLSG had concluded that over the long term it would be necessary to completely revamp the existing flight plan in order to cater for the information management requirements that were prerequisite to the realization of the Global ATM Operational Concept.

7.22 Substantial parts of this proposal had been developed by the study group in collaboration with the Operational Data Link Panel (OPLINKP) and the Required Navigation Performance and Special Operational Requirements Study Group (RNPSORSG).

7.23 The meeting noted the information in the State Letter in relation to amendments to the ICAO Flight Plan and that an implementation date of November 2010 was proposed.

Regional survey of requirements for meteorological information in support of ATM

7.24 The meeting was informed of a planned survey of the meteorological requirements for ATM to be conducted by the MET/ATM Task Force of the CNS/MET Sub Group. The meeting was reminded that the MET/ATM/TF was established by the CNS/MET/SG/5 in July 2001 to investigate the MET requirements for ATM, with terms of reference as follows:

- a) Evaluate the current and future requirements for MET in support of ATM in the ASIA/PAC Region and provide guidance material to assist States to develop MET services to meet these requirements.
- b) Monitor the emerging capabilities and developments of MET and as necessary update regional plans for the implementation of MET services and facilities.
- c) Promote communication between MET and ATM communities in the ASIA/PAC Region to enhance the level of understanding of MET requirements and capabilities in support of ATM.

7.25 To date, the main outputs of the Task Force work are: development of Chapter 11, Meteorology of the ASIA/PAC Regional Plan for the New CNS/ATM Systems, and organizing and conducting a very successful MET/ATM Coordination Seminar at the Regional Office in February 2006.

7.26 The importance of the meteorological information for ATM has been outlined in the ICAO Global ATM Operational Concept. The performance of most of the ATM system components were weather dependent. Paragraph 2.9.18 of the Operational Concept outlines the main benefits for the ATM system from improved meteorological information.

7.27 The effect of the expected improvements of the meteorological information and services would be much greater if the new products and services were based on well defined ATM requirements for MET. The MET/ATM Coordination Seminar (February 2006) recommended that the ATM requirements should be further studied. APANPIRG/17 endorsed this recommendation, and in follow up to Conclusion 17/43, the MET/ATM/TF was requested to develop a questionnaire for conducting a regional survey with the States' ATM authorities. It is the intention of the Task Force to use the results of the survey to identify common requirements and identify areas to be considered for further development. The survey was expected to be completed by the end of 2007.

7.28 The meeting agreed that feedback in relation to the proposed survey questionnaire, a copy of which is provided at **Appendix C** to the Report on Agenda Item 7, would be transmitted directly to the Rapporteur of the METATM Task Force, Mr. Ted Williams of the Australian Bureau of Meteorology, at T.Williams@bom.gov.au before the end of August 2007. Following consideration by the CNS/MET/SG/11 meeting and incorporation of feedback, the survey would be transmitted regionally by State Letter.

Oakland ARTCC ATS Route Realignment

7.29 Ocean21, the air traffic control system utilized within Oakland FIR has been operational for just under two years. The enhanced capabilities available through this system allow for application of reduced separation standards. With this enhanced capability, and in support of the ICAO's efforts to reduce operator costs and ecological impacts, the FAA has been evaluating Air Traffic Service ATS routes and airspace structure in the vicinities of Guam and Hawaii. The proposed ATS route changes include:

- Five route changes in the vicinity of Guam and planned to be effective August 2007.
- Realignment of six ATS routes from Hawaii to South Pacific destinations.

- Realignment two Central East Pacific (CEP) waypoints and A322 between the Continental United States.

7.30 After coordination with other air navigation service providers (ANSPs), the FAA will be responsible for completing the necessary ICAO coordination. Implementation of the route changes in the vicinity of Guam will take place on 30 August 2007, with the changes in the vicinity of Hawaii occurring at a later stage. The United States thanked Japan for the flexibility that had been demonstrated in negotiations for the routes in the Guam area.

7.31 The meeting recognized the significant efficiencies that would be gained by the route realignments and congratulated the United States on this initiative that would result in quantifiable environmental benefits.

7.32 IATA highlighted to the meeting the effectiveness of the project management approach that had been adopted by the United States in pursuing the route enhancements. The process had been initiated entirely by the United States using environmental benefits as the main justification and had made good use of consultative methodologies that included full coordination with affected neighbouring States and airspace users. IATA considered that this was a 'best practice' approach that had resulted in dividends for all and requested that the methodology and success of these initiatives be highlighted as a model for other States to follow.

Report on the Business Case Development for ADS-C In-Trail procedures (ITP)

7.33 The FAA reported that it was continuing the background work associated with the development of an in-trail climb through and descent through procedure using Automatic Dependent Surveillance-Contract (ADS-C) capabilities. The FAA was currently focusing on the development of a business case for the procedure.

7.34 Upon successful completion of the ITP benefits case, the FAA would share the benefits findings with airlines, industry and global air navigation service providers for partnership in the planning of ADS-C ITP development.

Operational performance requirements for end-to-end satellite communications

7.35 Oakland ARTCC (ZOA) introduced the 30/30 separation standard on a trial basis in Oceanic Control Sector 3 (OC3) in December 2006. As part of the trial, the FAA established a Scrutiny Group to evaluate the OC3 30/30 operational trial. The 30/30 Scrutiny Group was tasked to examine data from the operational trial and data link communications within the entire Oakland Oceanic FIR.

7.36 The initial findings of the 30/30 Scrutiny Group indicated that the initial trials were a success, with one notable exception. The exception was the reliability of the Perth Ground Earth Station (GES) which had suffered several outages over the course of the 30/30 trials. Based on this information and the knowledge that the Perth GES was still subject to outages due to known and unknown problems, the FAA made the determination to expand the 30/30 trials on the planned date of March 13, 2007 but with a different operational concept. The FAA restricted the use of ADS based separation (30/30 and 50NM longitudinal) to application for climb/descent only, not for cruise flight.

7.37 On April 18, SITA successfully made the last planned calendar year 2007 upgrade to the Perth GES. This action corrected all of the problems known at that time with the Perth GES that caused the FAA to restrict the use of reduced separation standards that rely on data-link services (Controller-Pilot Data Link Communications/Automatic Dependent Surveillance-Contract,

CPDLC/ADS-C). Subsequently, on June 9, 2007, Oakland ARTCC removed the restrictions to the use of ADS-C based reduced separation.

7.38 The situation in relation to the difficulties with the Perth GES served to highlight the apparent lack of any mechanism to compel adequate end-to-end performance of satellite communications systems (i.e. GES, datalink services providers, satellites etc) which are used for the provision of operational ATS, including reduced separation applications using CPDLC, ADS etc such as 30NM lateral/30NM longitudinal. The meeting was not aware of any relevant ICAO provisions in relation to, for example, requirements for redundancy of GES requiring alternate GES availability, but noted the availability of the *Guidance Material for End-to-End Safety and Performance Monitoring of ATS Datalink Systems in the Asia/Pacific Region*. The meeting also noted the lack of alternate GES for most of the region and considered that this comprised a single point of failure in the end-to-end system.

7.39 The meeting recognized that there were a number of data link trials under way in the Asia/Pacific Region that would move to permanent implementation over the next two years with the intention of facilitating reduced separation applications. As the Perth GES is essentially the sole GES available for most of the region, this would place significant additional message loadings onto the existing system. Doubts were expressed as to the capability of regional Data Services Providers (DSPs) to adequately carry this message load at an end-to-end performance level that was suitable for operational use, particularly with reduced separations.

7.40 Discussions during the meeting suggested that the difficulties described above were not solely confined to FANS data link applications, rather they were inherent in satellite based communications and would therefore also affect ATN based implementations. The meeting expressed strong concerns at the circumstances being reported and sought the assistance of ICAO in terms of the following draft Conclusion:

Draft Conclusion 17/20 – Satellite communications performance requirements

That, noting the history of poor communications performance and lack of redundancy associated with the provision of regional datalink services and the increasing regional implementations of datalink based reduced separation applications, ICAO be invited to urgently clarify the provisions relating to end-to-end system performance of satellite communications systems to meet current and future datalink (ADS/CPDLC) demands.



ATM/AIS/SAR/SG/17
Appendix A to the Report on Agenda Item 7

Performance Based Navigation Progress Report

David VanNess
PBN Implementation & Resource
Development Coordinator
ICAO Headquarters, Montreal



Presentation overview

- ✈ PBN – Background
- ✈ PBN – Concept
- ✈ PBN – Status
- ✈ PBN – Implementation





Aviation challenges

- ✈ Growing demand for RNAV approaches (safety, accessibility)
- ✈ Growing demand for solutions to airspace congestion
- ✈ Growing fuel efficiency requirements
- ✈ Growing Environmental requirements
- ✈ **Most can be met with current technology, but standardization and operational requirements have to be put into place**



Background

ICAO RNP concept

- ✈ FANS identified need for performance based navigation and developed *Required Navigation Performance* capability concept :
 - To avoid need for ICAO selection between competing systems
- ✈ Manual on Required Navigation Performance (doc 9613)
- ✈ Addressed only the en-route phase of flight (RNP-10 and RNP-4) for oceanic and remote applications
- ✈ No ICAO RNP requirements for continental enroute and terminal applications. This led to:
 - Proliferation of national standards
 - Wide variety of functional requirements
 - Variety of required navigation sensors
 - Differing air crew requirements
 - **Lack of global harmonization**



Background Industry's RNP concept

RNP concept has continued to evolve outside ICAO

- ✈ RTCA/EUROCAE defined performance and functional requirements
- ✈ Industry's RNP requires performance monitoring and alerting

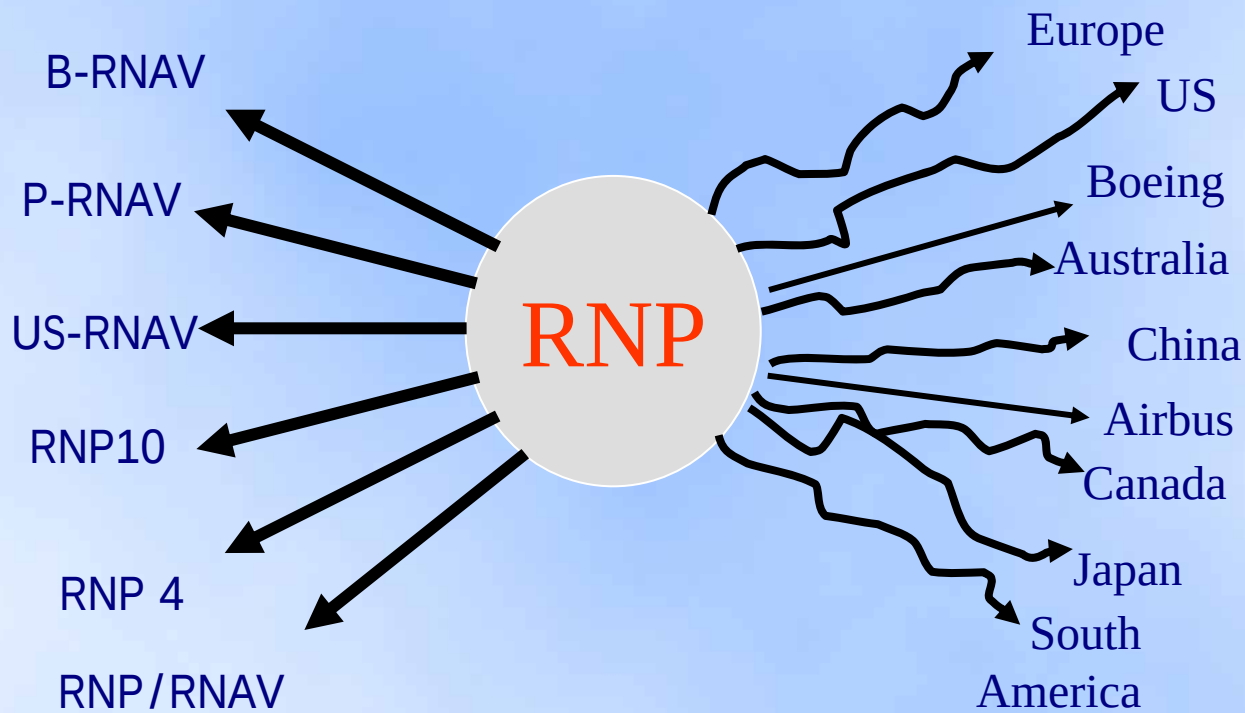
Conflict

- ✈ Current ICAO concept does not require performance monitoring and alerting
- ✈ Now we have two RNP concepts.



Are we now going the right way?

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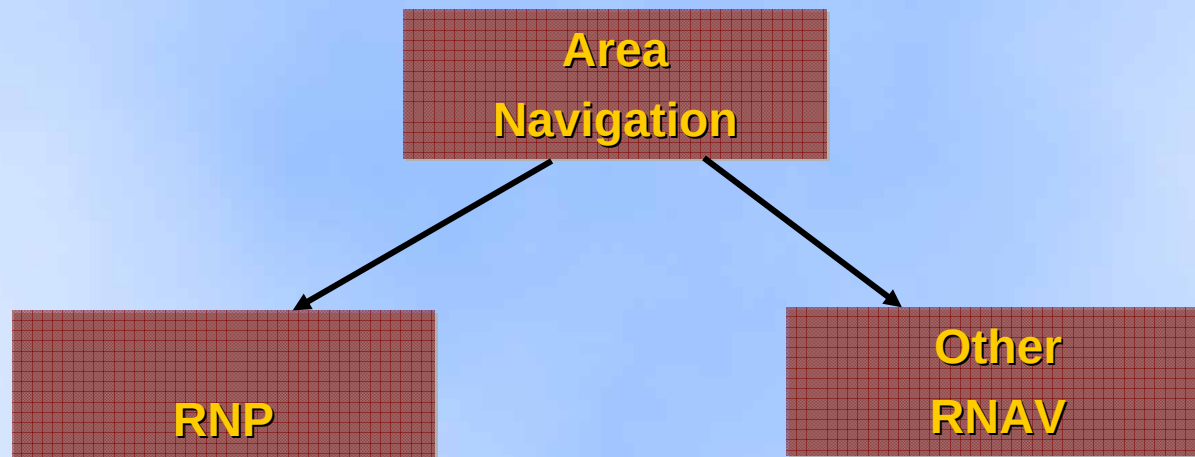


F
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Not safe, not efficient, costly, confusing



RNP in relation to area navigation





RNP-where we are today





ICAO recognizes the problems

- ✈ Need for focal point in ICAO to address problems experienced with RNP Concept (GNSSP/4 recommendation 1/1)
- ✈ ANC approves establishment of Required Navigation Performance Special operational requirements Study Group (RNPSORSG) as coordinating group



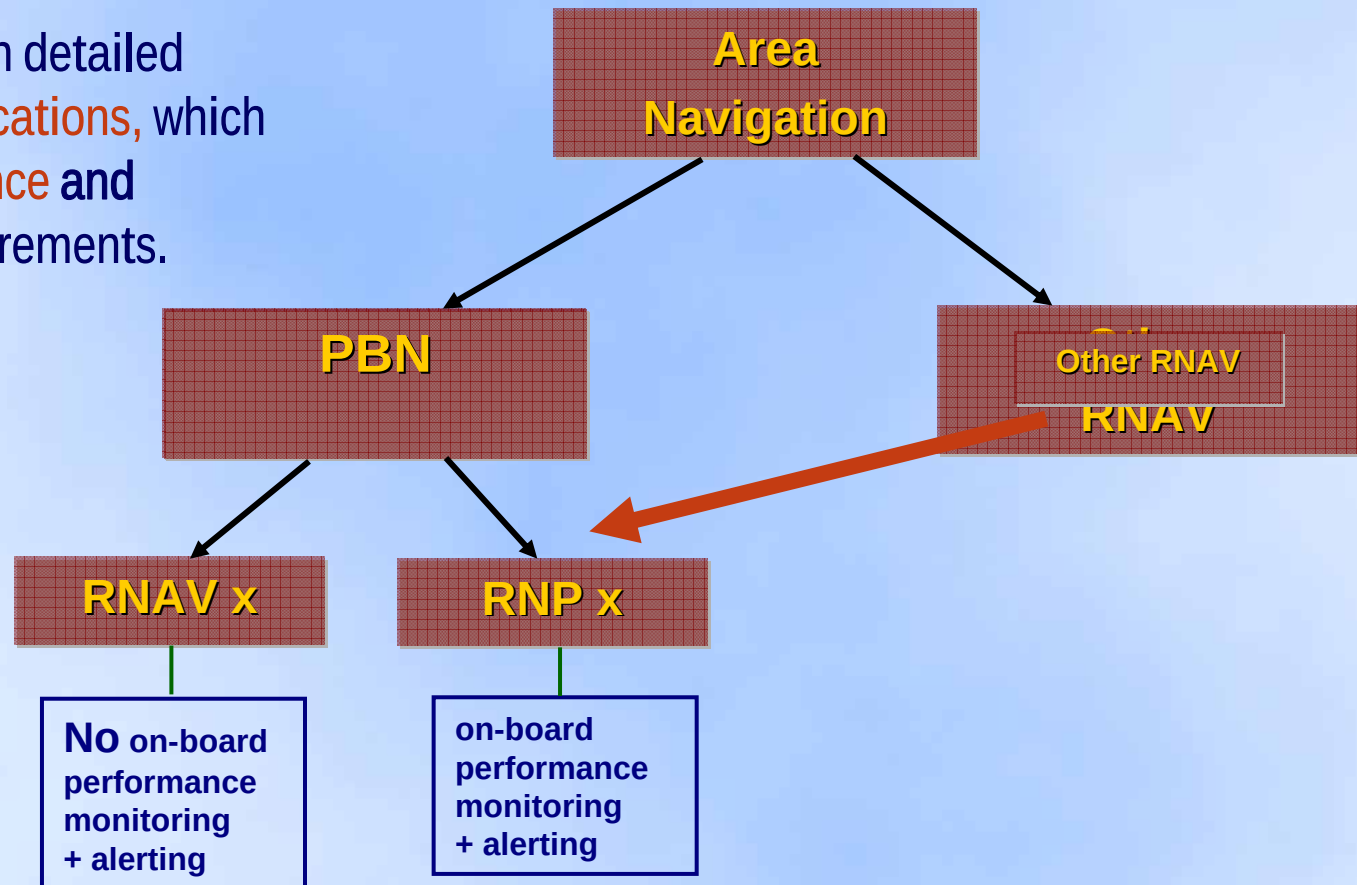
Adjustment to the RNP concept required

- ✈ Clear distinction between operations that require performance monitoring and alerting and operations that don't require performance monitoring and alerting
- ✈ Harmonization of current RNAV and RNP operations
- ✈ Development of new navigation specifications to meet operational demand.
- ✈ Need for clear operational approval requirements
- ✈ Need for clear implementation guidance



RNP revised towards PBN

PBN is anchored in detailed navigation specifications, which contain performance and functionality requirements.





Harmonization of existing navspecs

Simplification results
in lower costs for
Operators and ANSP

Area of Application	Nav accuracy	Designation of navigation standard: <i>Current situation</i>	Designation of navigation specification: PBN concept <i>(new)</i>
Oceanic/ Remote	10	RNP 10	RNAV 10 (RNP 10 label)
	4	RNP 4	RNP 4
EnRoute- Continental	5	RNP 5 Basic RNAV	RNAV 5
En Route - Continental and Terminal	2	USRNAV type A	RNAV 2
Terminal	1	USRNAV type B <u>and</u> P-RNAV	RNAV 1



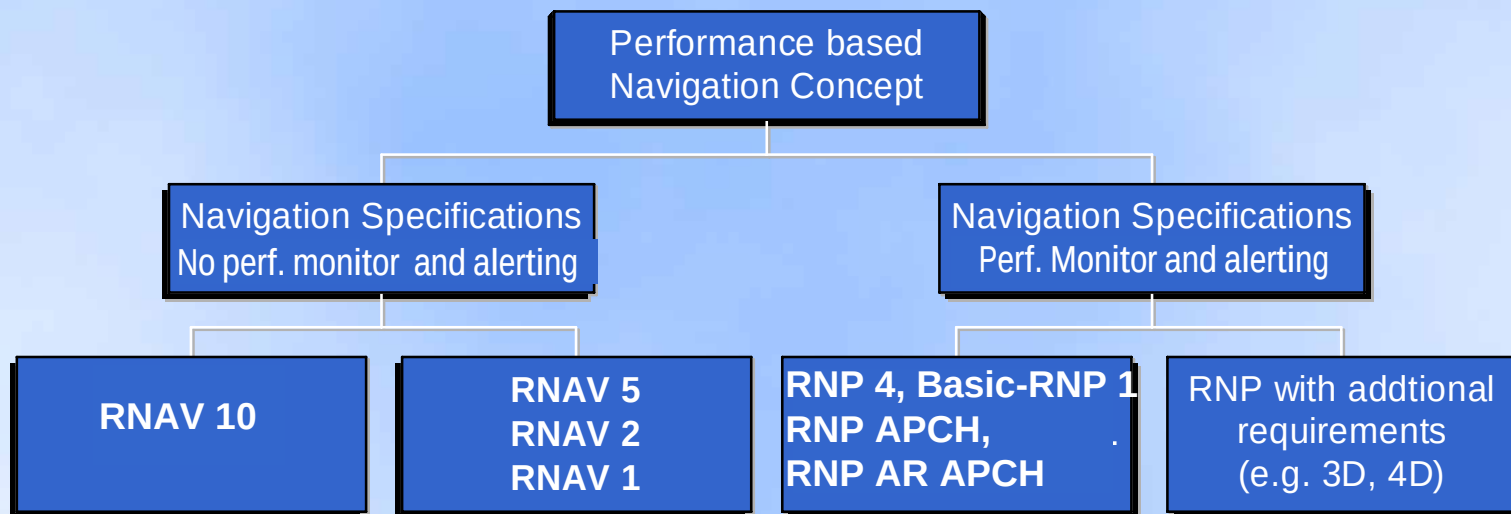
Harmonization of RNAV operations not covered by existing nav specs

Area of Application	Nav accuracy (NM)	Designation of navigation standard: <i>Current situation</i>	Designation of navigation specification: PBN concept <i>(new)</i>
Terminal	1	Basic-GNSS SBAS	Basic-RNP 1
Approach	1-0.3	Basic-GNSS (Baro-VNAV) SBAS	RNP APCH
Approach	1-0.1	RNP SAAAR (US)	RNP AR APCH



RNP SORSG

Performance Based Navigation Concept



Performance Based Navigation (PBN)

Area navigation based on performance requirements for aircraft that are described in navigation specifications



Current status

- ✈ Final draft of PBN manual is finalized and posted on ICAO-NET
- ✈ State Letter with Navigation Specifications is on ICAO-NET
 - AN 11/45-07/22, 27 April 2007



ICAO Provisions

Performance Based Navigation Manual

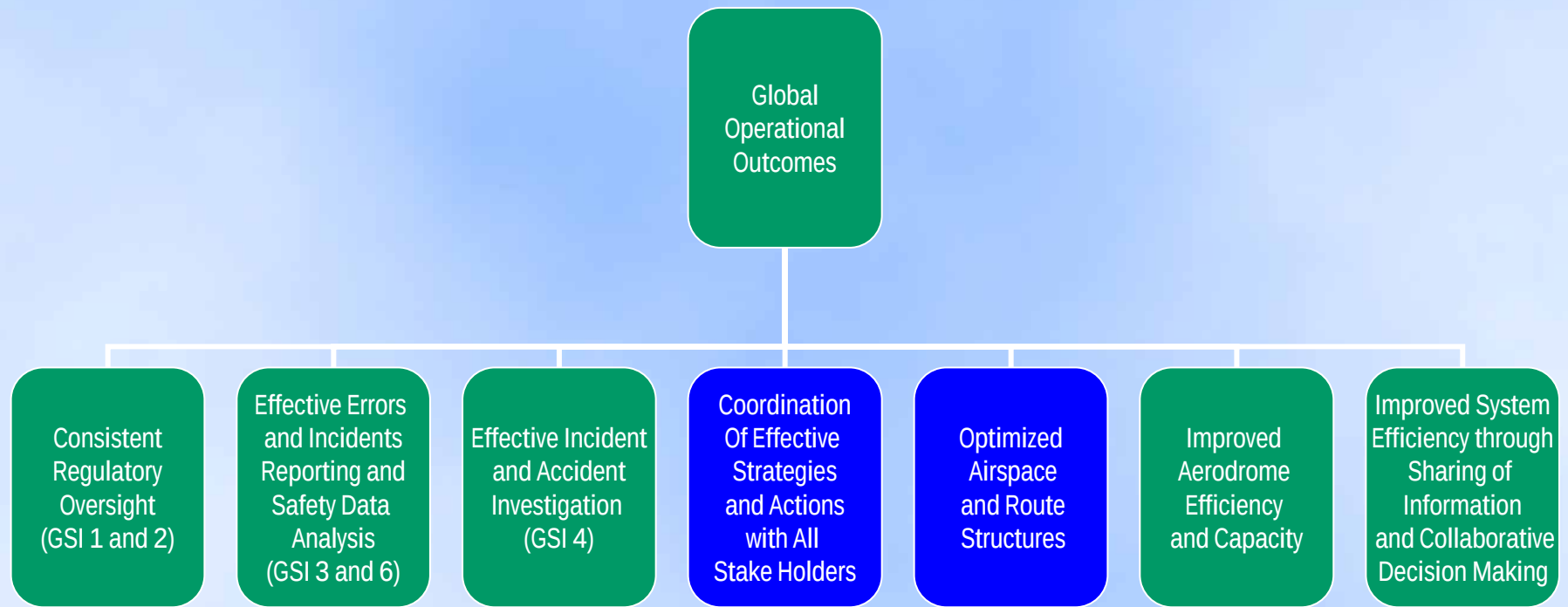
- ✈ PBN Manual to provide a “one-stop shop” for States on how to implement RNAV and RNP in their airspace
- ✈ PBN Manual consists of two volumes:
 - Volume I – Concept and Implementation Guidance
 - Concept of PBN and how it is used
 - Implementation Guidance to States/Regions
 - Volume II – Implementing RNAV and RNP
 - Compendium of Navigation Specifications

RNAV 10	RNAV 1	RNP APCH
RNAV 5	RNP 4	RNP AR APCH
RNAV 2	Basic RNP 1	Advanced RNP 1*
		RNP 2*

** Projected work for 2008*



ICAO Global Operational Outcomes





PBN implementation goals

Enroute airspace

(where RNAV ops required)

Area of operation: Oceanic and remote airspace

- Applicable navigation specifications: RNAV 10 and RNP 4
- Implementation strategy: 100% implementation by **2010**

Area of operation: Enroute continental

- Applicable navigation specifications: RNAV 5, 2, and 1
- Implementation strategy: 70% by 2010, 100% by **2014**



PBN implementation goals

Terminal airspace

(where RNAV ops required)

✈ Area of operation: Terminal area

- Applicable navigation specifications: RNAV 1,2 and Basic-RNP 1
- Implementation strategy: 30% by 2010, 60% by 2014, 100% by **2016**



PBN implementation goals Approach

Area of operation: Approach (RNP)

✈ Applicable navigation specifications:

- RNP APCH
- RNP AR APCH (if normal straight-in approach is operationally not feasible)

✈ Implementation strategy:

- All instrument runways:
 - APV to all runway ends by 2016.
 - NPA where APV is operationally not possible



Implementation

- ✈ Leadership role for ICAO
 - Familiarization
 - Implementation
 - Alignment of ICAO provisions
- ✈ States
 - Develop implementation plan by end of 2009
 - Follow through with plan
- ✈ Stakeholders
 - cooperate with States in their implementation
 - commit the resources necessary to carry out their part of the strategy



Implementation

ICAO Leadership role

- ✈ Familiarization
 - States, Stakeholders, ICAO
- ✈ Implementation
 - Planning assistance
 - Execution assistance
 - Verification
- ✈ Development and maintenance of ICAO provisions



Familiarization Web Based Training

PERFORMANCE BASED NAVIGATION (PBN) - Microsoft Internet Explorer provided by ICAO ICT

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites

Address <http://www.ecacnav.com/test/pbn-training/pbn/frames/firstwin.htm> Go

Google G Go blocked Check AutoLink AutoFill Send to Settings Links

PERFORMANCE BASED NAVIGATION (PBN)

General Introduction Introduction to PBN Concepts of PBN Summary/Aims Area Navigation

ABOUT THIS TRAINING MODULE:

This training module, for Airspace Planners/Designers, Air Traffic Control (ATC) staff and Aviation Personnel, is an overview of Performance Based Navigation (PBN).

The module supports the 'PBN Manual', which replaces the 'Manual on Required Navigation Performance (RNP) ICAO Doc 9613-AN937'.

Module structure:

- The module is divided into 4 main topics, shown by the tabs at the top of the screen (the topic menu) just under the module title. ('Area Navigation' is an extra topic for those who wish to review it.)
- You can select any topic at any time, although it is suggested that, initially, you complete the main 4 in order.
- It should take you approximately 1 hour to complete the module.

Moving through the topics:

- To select a **topic** you click on the appropriate **tab** at the **top of the screen**

TOPIC TABS - clicking on these will take you to the first page of the topic

PERFORMANCE BASED NAVIGATION (PBN)

General Introduction Introduction to PBN Concepts of PBN Summary/Aims Area Navigation

TEXT AREA

GRAPHICS & ACTIVITY AREA

GLOSSARY

EXIT Page 1 of 3

ABAS: Airborne based augmentation System. An augmentation system that augments and/or integrates the information obtained from the other GNSS elements with information available on board the aircraft.
Note: - The most common form of ABAS is receiver autonomous integrity

Internet 16:34



Familiarization “Introduction to PBN” Seminar





ICAO Headquarters

- ✈ Organize seminars
- ✈ Website for info/FAQ on PBN (www.icao.int/pbn)
- ✈ Additional training for ICAO regional officers
- ✈ Assist in PIRGs with setting PBN goals and developing regional PBN implementation plans “PBN Roadmaps”
- ✈ Coordinate and assist in PBN implementation planning and execution
 - (sub) Regions
 - States and other stakeholders
- ✈ Identify and address follow-on training needs and other potential obstacles to implementation



Regional Office

- ✈ Assist in organizing seminars
- ✈ Provide focal points for PBN at the RO
- ✈ Monitor implementation progress in the Region
- ✈ Coordinate development of Regional PBN implementation plan “PBN Roadmap”
- ✈ Coordinate implementation planning and execution for PBN enroute operations
- ✈ 1st level of assistance in Region for PBN implementation planning and execution for terminal and approach operations



States

- ✈ Maximise participation in Introduction to PBN Seminars by encouraging stakeholders in your State to participate
- ✈ Participate in development of Regional PBN implementation plan “PBN Roadmap”
- ✈ Develop State PBN implementation plan by the end of 2009
- ✈ Identify issues or “Showstoppers” that could delay implementation, and relay to ICAO



Recommendations to APANPIRG/18

- ✈ Establish a PBN Task Force to develop a Asia-Pacific Region PBN implementation plan and address other regional PBN implementation issues
- ✈ Encourage States to begin development of their State PBN implementation plans



Summary

- ✈ PBN concept is established
- ✈ Familiarization is imminent
 - Bangkok seminar 11-14 September
 - New Delhi seminar 17-21 September
- ✈ ICAO must assume leadership role in implementation
- ✈ Commitment and active involvement required from States and other stakeholders

**Asia Pacific Air Navigation Planning and Implementation Regional Group
Performance Based Navigation (PBN) Task Force**

Proposed Terms of Reference

- 1) Develop an Asia Pacific Regional PBN implementation plan to optimize airspace and route structures in the region through implementation of PBN in line with the ICAO PBN goals and milestones. This PBN implementation plan must be based on the following strategic objectives and guiding principles;

Strategic objectives:

- a) To ensure that the implementation of the navigation item of the CNS/ATM system is based on clearly established operational requirements;
- b) to avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on ground;
- c) to avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations;
- d) to prevent commercial interests from outdoing ATM operational requirements, generating unnecessary costs for States and International Organizations, as well as for airspace users; and
- e) to explain in detail the contents of the Regional Air Navigation Plan and of the Regional CNS/ATM Plan, describing potential navigation applications.

Guiding principles:

- a) Cost-benefit analyses will be conducted to justify the implementation of RNAV and/or RNP concepts in each particular airspace;
- b) pre- and post-implementation safety assessments will be conducted to ensure the application and maintenance of the established target levels of safety;
- c) airspace concept development should be accomplished by applying airspace modelling tools as well as real-time and accelerated simulations, which will confirm the navigation applications that are compatible with the aforementioned concept;
- d) continued application of conventional air navigation procedures during the transition period, to guarantee the operations by users that are not RNAV- and/or RNP-equipped;

- e) the first regional PBN implementation plan should address the short term (2008-2012) and medium term (2013-2017); and
 - f) target date for completion of the first regional PBN implementation plan is APANPIRG/19.
-
- 2) Carry out specific studies and develop guidance material to assist States with RNAV/RNP implementation in the en-route, terminal, and approach flight phases, taking into account the performance based navigation (PBN) concept, according to the ICAO Strategic Objectives and Global Plan Initiatives (GPI) on this matter (GPI 5, 7, 10, 11, 12, 20, 21);
 - 3) Identify other issues/action items arising from the work of the RNP SORSG or for consideration by the RNP SORSG in order to facilitate regional and global harmonization of existing applications as well as future implementation of Performance Based Navigation operations; and
 - 4) Address other regional PBN implementation issues as needed.

.....

Meteorological information and services in support of air traffic management

1. Focus

The focus of this survey is on forecast meteorological elements and advice on expected conditions in support of air traffic management. While completing this survey please consider the current and future requirements for meteorological information for all aspects of ATM.

2. Use of Met

A list of meteorological elements commonly required in support of ATM is provided in the table below. A sample response is provided at Attachment A. Please fill in the appropriate sections of the form to provide:

- A. A brief description of how each element is used in your planning and operations (e.g. runway planning, capacity planning, sequencing etc)
- B. Information source for this element (e.g. TAF, Trend, SIGWX chart, verbal advice etc.)
- C. Deficiencies and suggestions. If your needs are not currently met provide comments on or explanation of why. (e.g. accuracy, information not available, inadequate lead time, inadequate spatial/temporal/vertical resolution, unsuitable format/presentation, use of inappropriate thresholds, etc). Please indicate any suggestions on the provision of the element to better satisfy your requirements (e.g. probability/forecast uncertainty/confidence/alternate scenario etc.)

Additional Met: If there are any elements/services affecting ATM that are not listed please add any elements to the table.

You may wish to consider the following elements which have been identified by the WMO CAeM Expert Team on New Terminal Forecast and European ICAO METG:

- Low level wind (in addition to “surface wind”)
- Temperature
- Runway condition forecast (temperature, icing, frost)
- Density altitude
- Precipitation rate
- Hail size
- CB activity
- Noise abatement parameters
- Low level temperature inversion
- Extended forecast (beyond 24 h) for specific hazard (TC).

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State:
Organisation:

	A	B	C
Element	Description of Use(s)	Current Source(s) of Information	Deficiencies and suggested improvements
Surface Wind			
Surface Wind Gusts			
Visibility			
RVR			
Vertical Visibility			
Significant weather 1 (e.g. TS)			

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Significant weather 2 (e.g SN)			
Significant weather 3			
Significant weather 4			
Cloud base/amount			
Turbulence (Terminal)			
Wake Turbulence/Vortex information			
Turbulence (Enroute)			

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Upper Winds			
Icing			
Wind shear			
TC			
VA			
Other 1			
Other 2			
Other 3			
Other 4			

3. Prioritisation

Please indicate the 5 elements which have the biggest impact or cause you the greatest concerns to ATM.

	Element	Impact/Concerns
1		
2		
3		
4		
5		

4. MET Support in addition to Annex 3 products

Does your ATM Authority currently have access to:

a. Advice on terminal weather (in addition to Annex 3 type products)?: Yes/No

If so please provide a brief description of the additional service and information and how it is delivered (e.g. Routine web based product focussed on ATM specific cloud/visibility and wind thresholds, or daily elaborative telephone briefings).

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b. Advice on en-route weather (in addition to Annex 3 type products)?: Yes/No

If so please provide a brief description of the additional service and information and how it is delivered.

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5. Decision Support Tools

a. Has your ATM or/or MET authority developed any MET related decision support tools for use by ATM? Yes/No

If so please provide a brief description of the tool(s) and the benefits realised.

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b. Is your ATM or/or MET authority developing any MET related decision support tools for use by ATM? Yes/No
If so please provide a brief description of the tool(s) and expected benefits.

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6. Other Comments
Please feel free to provide any further comments on current and future ATM requirements for MET.

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7. Contact Details
If you are happy to be contacted for further follow-up or clarification please include your contact details here.

Name:
Organisation:
E-mail:
Phone:
Facsimile:

Attachment A – Example

STATE: Weatherland (fictitious country)

	A	B	C
Element	Description of Use(s)	Current Source(s) of Information	Deficiencies and suggested improvements
Surface Wind	Runway planning, capacity planning.	TAF, Trend, METAR, local report, Doppler Radar, real-time sensors	Information is of sufficient quality but could be packaged better. Forecast confidence indication would be beneficial. Graphical Display, longer lead times, confidence/alternate scenarios provided
Surface Wind Gusts	Runway planning, capacity planning.	TAF, Trend, METAR, local report, real-time sensors	Forecast gust information not available. No forecast information is available for low speed gusts threshold should be zero. Provided for whole of aerodrome but required for individual runway thresholds.
Visibility	Runway planning, flow management/capacity planning, sequencing	TAF, Trend, METAR, local report, real-time sensors	ATM thresholds reflected by forecasts or hourly values provided.
RVR	Not used	Nil	Not applicable
Vertical Visibility	Used to assess landing conditions	METAR, local report, real-time sensors	Nil
Thunderstorm	Runway planning, capacity planning. Assists with enroute diversion decisions.	TAF, Radar, Satellite Imagery, SIGWX charts (WAFS/Local), SIGMET/ AIRMET	Lack of spatial/temporal resolution. Require hourly en-route TS location forecast out the 3 hours, and to 60 minutes for terminal TS locations
Snow	Used to estimate surface movement delays, clearing requirements	TAF/Trend	Quantitative estimate would be useful.
Significant weather 3			
Significant weather 4			
Cloud base/amount	Runway planning, flow management/capacity planning, sequencing	TAF, Trend, METAR	Refer visibility

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Turbulence (Terminal)	Short term capacity planning, sequencing	Aircraft reports, TAF, Trend, SIGMET/AIRMET	A intensity metric would be useful, more study the relationship between intensity and ATM impacts required
Wake Turbulence/Vortex information	Short term capacity planning, sequencing	Aircraft reports	Observed only - no forecast information available. Reliable forecasts could increase capacity through reductions in separation standards applied
Turbulence (Enroute)	Provides advice of possible enroute delays and congestion	Aircraft reports, SIGWX/SIGMET/AIRMET	Nil
Upper Winds	Flow management, sequencing	WAFS, Aircraft reports, Lidar	Temporal and spatial resolution inadequate for tailored arrival concept. Resolution required at least 3 hourly at 10km, and several more vertical levels.
Icing	Provides advice of possible en-route delays and congestion	Aircraft reports, SIGWX/SIGMET/AIRMET	Nil
Wind shear	Short term capacity planning, sequencing	Aircraft reports/Wind Shear Warnings	Information not available at long enough lead time for capacity planning Development of longer term forecasts required.
TC	Runway planning, capacity planning. Route planning	TC advisories, TAF/Trend/ briefings	Nil
VA	Route planning	VA advisories, briefings	Lack of VA information for poorly monitored volcanoes. Introduction of VA graphic has saved significant work and been very well received
Extended period forecasts (out to 72 hours)	Capacity planning, staff planning	Written briefing, verbal advice	Accuracy and temporal resolution of cloud base/visibility for airport capacity planning needs improvement at longer lead times.
Other 2			
Other 3			
Other 4			

**AGENDA ITEM 8: DEFICIENCIES IN THE AIR
NAVIGATION FIELD**

Agenda Item 8: Deficiencies in the Air Navigation field

Special Implementation Project to Assist States in the Rectification of Air Navigation Deficiencies

8.1 The meeting was provided with information on the SIP undertaken by a Regional Officer ATM and a CNS expert to Bangladesh from 5 to 8 June 2007 in follow-up to APANPIRG Conclusion 17/51 to assist with the rectification of deficiencies in the air navigation fields. The SIP was intended to address difficulties with air/ground and ground/ground communications, poor ATC practices and non compliances with Annexes 14 and 15.

8.2 The SIP proposed recommendations to the Civil Aviation Authority of Bangladesh on the following matters: training and testing for English language proficiency, prior coordination procedures between Dhaka and Kolkata ACCs, coordination with neighboring FIRs/ACCs, a study of the full use of the approach radar at Dhaka Airport, resumption of ATIS operation at Dhaka Airport, reduction of access time on ATS direct speech circuits, and the need to arrange a co-ordination visit to India.

8.3 Based on the recommendations an Action Plan was formulated urging the Administration to take actions accordingly to mitigate identified deficiencies.

List of Air Navigation Deficiencies in the ATM/AIS/SAR Fields

8.4 The meeting recalled that APANPIRG/17 had expressed concern at the slow progress in eliminating the safety related deficiencies. It was stressed that the States listed in the APANPIRG List of Deficiencies should make firm commitments and undertake decisive actions to resolve the deficiencies as soon as possible. It was strongly recommended that States should apply cooperative efforts and a sub-regional approach to resolution of deficiencies should be undertaken to address typical deficiencies observed in certain areas.

8.5 In light of its discussions, APANPIRG/17 under Conclusion 17/54 set up a performance objective related to the resolution of deficiencies calling upon States to establish action plans, target dates and to inform the Regional Office by mid 2007 of their plans.

8.6 It should also be noted that APANPIRG/17 agreed that the Deficiency Review Task Force, established by APANPIRG Conclusion 13/46, should convene one meeting in the first quarter of 2007 to undertake a review of the implementation aspects of the Regional Supplement to the Uniform Methodology. This meeting has been scheduled for 23-25 July, immediately following the CNS/MET/SG/11 meeting.

8.7 In addition, these matters were further reviewed during the 43rd DGCA Conference at Bali, Indonesia (December 2006) and Action Item 43/1 was raised urging Asia Pacific States to take action on APANPIRG Conclusion 17/54, and to collaborate in resolving of the safety related deficiencies according to the established action plans.

8.8 The Secretariat informed the meeting that despite the concerted efforts from APANPIRG/17 and the 43rd DGCAs, very little information had been received from States in relation to the mid 2007 timeline to inform the Regional Office of action plans aimed at correcting deficiencies. The Secretariat would carefully review the limited material at hand and update the deficiencies list before the APANPIRG/18 meeting later this year.

8.9 Thailand, in noticing that some of the deficiencies related to States neighbouring Thailand who were not present at the meeting, undertook to coordinate with these States before APANPIRG/18 with a view to assisting them to correcting the deficiencies listed

8.10 The meeting reviewed and updated the List of Air Navigation Deficiencies in the ATM/AIS/SAR fields as updated by APANPIRG/17 and subsequently by the Regional Office based on information available before May 2007. The updated List is appended at **Appendix A** to the Report on Agenda Item 8.

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

(Changes proposed after APANPIRG/17 are shown in strikeout and underlining.)							<i>(last updated 6 July 2007)</i>	
Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>ATS Routes</u>								
Requirements of Part VIII, Table ATS 1 of the Air Navigation Plan	India/Nepal	A473 - Not implemented	16/3/99	A new proposal was submitted in mid 2003 by Nepal. This is being coordinated by AAI with defense authorities.	India/Nepal - implement the route	India/Nepal	Item captured in Chapter 2 of the Route Catalogue. ATM/AIS/SAR/G/16 (June 2006) updated re progress.	B
	China	B591 - Partially implemented	22/7/97		China will consider future imeplementation.	China	Reviewed by ARNR/TF. Item captured in Chapter 2 of the Route Catalogue ATM/AIS/SAR/G/16 (June 2006) updated - route implemented in Shanghai FIR, however implementation is not in accordance with BANP, further implementation TBD	B
	~~Indonesia~~	~~G461 - Implemented with different route specification. Implemented~~	~~24/11/93~~	~~ICAO co-ordinated with Indonesia to amend BANP requirement. APAC00/1 ATS was approved on 15 January 2001.~~	~~Indonesia implement the requirement accordingly.~~	~~Indonesia~~	~~Implemented with different route specification. Amendment Proposal to be submitted. Captured in Chapter 3 of the Route Catalogue.~~	~~B~~
	Cambodia/Philippines/Thailand/Viet Nam	G473 - Partially implemented	24/11/93	Co-ordination is in progress among States and ICAO.	ICAO - continue implementation co-ordination.	Cambodia /Philippines Thailand/Viet Nam/ICAO	Captured in Chapter 2 of the Route Catalogue.	B

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Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	China/Kazakhstan	R216 - Not implemented	24/11/93	CAAC advises current route B215 KUQA A460 REVKI to Alma Ata meets the requirements for traffic from Urumqi to Alma Ata and requests deletion of R216 from BANP (14 Apr 03).	CAAC will coordinate with Kazakhstan to delete R216 from BANP.	China/Kazakhstan ICAO	Captured in Chapter 2 of the Route Catalogue.	B
	Cambodia/Lao PDR/Thailand	R345 - Not implemented. Under the coordination process.	24/11/93	Cambodia has advised that the requirement is no longer valid and will propose the deletion of requirement in consultation with Lao PDR and Thailand.	Cambodia- coordinate the deletion with IATA as well as Lao PDR and Thailand	Cambodia/Lao PDR/ Thailand	Item captured in Chapter 2 of the Route Catalogue.	B
	Indonesia	R459 - Implemented as W51 and W36	24/11/93	ICAO has requested Indonesia to implement as R459.	Indonesia, Singapore - consider implementation of the route with designator L504.	Indonesia/Singapore	To be implemented as L504. Target implementation date TBD	B

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>WGS-84</u>								
Requirements of Paragraph 3.6.4 of Annex 15	Bhutan	WGS-84 - Not implemented	2/7/1999	Data conversion completed, but not published		Bhutan	TBD	A
	Cambodia	WGS-84 - Partially implemented	28/6/2001	Cambodia reported ICAO on 22 June 2004 that the WGS-84 coordinates have been implemented in international airports, airspace and international routing.		Cambodia	TBD	A
	China	WGS-84 - Not implemented * implemented in the Sanya FIR as of 1 Nov 2001	2/7/1999	Differences to Annex 15 - <i>Aeronautical Information Services</i> are notified		China	Planning in progress. China promoting actively, coordination with Regulatory Department in progress	A
	DPR Korea	WGS-84 - Not implemented				DPR Korea	2004	A
	Kiribati	WGS-84 - Not implemented				Kiribati	TBD	A
	Nauru	WGS-84 - Not implemented		Conferring with consultant		Nauru	TBD	A
	Philippines	WGS-84 - Implemented at international airports		on-going		Philippines	2006	A
	Solomon Islands	WGS-84 - Not implemented				Solomon Islands	1999	A

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Vanuatu	WGS-84 - Implemented at main airports	2/7/1999			Vanuatu	1999	A

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>Type of ATS</u>								
Requirements of Part II, Table ATS 3D of the Air Navigation Plan	India	Some ATS route segments in part of Mumbai FIR are subject to Advisory Services	24/11/93	Co-ordination in progress through BBACG. HF radio being modernized and datalink being installed.	India - implement Area Control Services	India	ATM/AIS/SAR/G/16 (June 2006) updated CPDLC trial progressing well, CRA to be established soon, implementation of CPDLC will enable update to control services FL290-FL410. <u>As of July 2007 CRA still not in place, consequent delay to datalink implementation</u>	A

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>Airspace Classification</u>								
Requirements of Paragraph 2.6 of Annex 11	China	Airspace Classification - Not implemented	7/7/99		Difference to Annex 11 is published in AIP, China.	China	ATM/AIS/SAR/G/16 (June 2006) updated, planning in progress to divide into 4 classes of airspace, some differences to ICAO airspace classifications	A
	DPR Korea	Airspace Classification - Not implemented	7/7/99			DPR Korea	2005	A
	Kiribati	Airspace Classification - Not implemented	7/7/99			Kiribati	TBD	A
	Nauru	Airspace Classification - Not implemented	7/7/99			Nauru	TBD	A
	Papua New Guinea	Airspace Classification - Not implemented	7/7/99			Papua New Guinea	Project in place	A
	Solomon Islands	Airspace Classification - Not implemented	7/7/99			Solomon Islands	TBD	A
	Viet Nam	Airspace Classification - Not implemented	7/7/99			Viet Nam	Expected completion 2007 (National Assembly adopted Civil Air Law on 29 June 2006, ATS regulations will be re-issued accordingly.)	A

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>AIP Format</u>								
Requirements of Chapter 4 of Annex 15	Cook Islands	AIP Format - Not implemented	7/7/99			Cook Islands	ATM/AIS/SAR/G/16 (June 2006) updated - AIP COOK ISLANDS in new format in progress with assistance of New Zealand, effective date TBD	A
	Kiribati	AIP Format - Not implemented	7/7/99			Kiribati		A
	Nauru	AIP Format - Not implemented	7/7/99			Nauru		A
	Papua New Guinea	AIP Format - Not implemented	7/7/99	under development		Papua New Guinea	TBA	A

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>SAR capability</u>								
Requirements of Annex 12	Cook Islands	Annex 12 requirements not implemented. No agreements with adjacent States.	31/1/95	SAR agreement with New Zealand under development	Cook Islands - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Cook Islands	2004	U
	Maldives	Annex 12 requirements not implemented. No agreements with adjacent States.	24/4/97	SAR services and facilities provided (details to be confirmed). SAR agreements with neighbouring States under development	Maldives - implement Annex 12 requirements and co-ordinate LOA with adjacent States ICAO - assist to develop SAR capability and to co-ordinate with adjacent States	Maldives	2004	U

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>Carriage of ACAS II</u>								
Requirement of Chapter 6 of Annex 6	Bhutan	Annex 6 requirement not implemented.	26/8/05		Bhutan - implement Annex 6 as required.	Bhutan	TBD	U
	Cook Islands	Annex 6 requirement not implemented.	26/8/05		Cook Island - implement Annex 6 as required.	Cook Islands	TBD	U
	Kiribati	Annex 6 requirement not implemented.	26/8/05		Kiribati - implement Annex 6 as required.	Kiribati	TBD	U
	Marshall Islands	Annex 6 requirement not implemented.	26/8/05		Marshall Islands - implement Annex 6 as required.	Marshall Islands	TBD	U
	Micronesia	Annex 6 requirement not implemented.	26/8/05		Micronesia - implement Annex 6 as required.	Micronesia	TBD	U
	Nauru	Annex 6 requirement not implemented.	26/8/05		Nauru - implement Annex 6 as required.	Nauru	TBD	U
	Palau	Annex 6 requirement not implemented.	26/8/05		Palau - implement Annex 6 as required.	Palau	TBD	U
	Papua New Guinea	Annex 6 requirement not implemented.	26/8/05		Papua New Guinea - implement Annex 6 as required.	Papua New Guinea	TBD	U
	Philippines	Annex 6 requirement not implemented.	26/8/05		Philippines - implement Annex 6 as required.	Philippines	TBD	U
	Solomon Islands	Annex 6 requirement not implemented.	26/8/05		Solomon Islands - implement Annex 6 as required.	Solomon Islands	TBD	U

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Tonga	Annex 6 requirement not implemented.	26/8/05		Tonga - implement Annex 6 as required.	Tonga	TBD	U
	Vanuatu	Annex 6 requirement not implemented.	26/8/05	Pressure altitude reporting transponder required in all airspace since 1/1/00.	Vanuatu - implement Annex 6 as required.	Vanuatu	TBD	U

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>Carriage of Pressure Altitude Reporting Transponder</u>								
Requirement of Chapter 6 of Annex 6	Bangladesh	~~Annex 6 requirement not implemented.~~ Implemented	26/8/05	ACAS II required since 1/1/03.	~~Bangladesh - implement Annex 6 as required.~~	Bangladesh	TBD	U
	Bhutan	Annex 6 requirement not implemented.	26/8/05		Bhutan - implement Annex 6 as required.	Bhutan	TBD	U
	Cambodia	Annex 6 requirement not implemented.	26/8/05	ACAS II required in all airspace within FIR since 1/1/03.	Cambodia - implement Annex 6 as required.	Cambodia	TBD	U
	Cook Islands	Annex 6 requirement not implemented.	26/8/05		Cook Island - implement Annex 6 as required.	Cook Islands	TBD	U
	DPR Korea	Annex 6 requirement not implemented.	26/8/05	ACAS II required in all airspace within FIR since 1/1/01.	DPR Korea - implement Annex 6 as required.	DPR Korea	TBD	U
	New Caledonia	Annex 6 requirement not implemented.	26/8/05	ACAS II required in all airspace within FIR since 23/1/03.	New Caledonia - implement Annex 6 as required.	New Caledonia	TBD	U
	Kiribati	Annex 6 requirement not implemented.	26/8/05		Kiribati - implement Annex 6 as required.	Kiribati	TBD	U
	Lao PDR	Annex 6 requirement not implemented.	26/8/05	ACAS II required in all airspace within FIR since 1/1/03.	Lao PDR - implement Annex 6 as required.	Lao PDR	<u>Completed</u>	U
	Marshall Islands	Annex 6 requirement not implemented.	26/8/05	ACAS II required.	Marshall Islands - implement Annex 6 as required.	Marshall Islands	TBD	U

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
	Micronesia	Annex 6 requirement not implemented.	26/8/05		Micronesia - implement Annex 6 as required.	Micronesia	TBD	U
	Nauru	Annex 6 requirement not implemented.	26/8/05		Nauru - implement Annex 6 as required.	Nauru	TBD	U
	Palau	Annex 6 requirement not implemented.	26/8/05		Palau - implement Annex 6 as required.	Palau	TBD	U
	Papua New Guinea	Annex 6 requirement not implemented.	26/8/05		Papua New Guinea - implement Annex 6 as required.	Papua New Guinea	TBD	U
	Philippines	Annex 6 requirement not implemented. Implemented within TMA only.	26/8/05		Philippines - implement Annex 6 as required.	Philippines	TBD	U
	Solomon Islands	Annex 6 requirement not implemented.	26/8/05		Solomon Islands - implement Annex 6 as required.	Solomon Islands	TBD	U
	Tonga	Annex 6 requirement not implemented.	26/8/05		Tonga - implement Annex 6 as required.	Tonga	TBD	U

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

Identification		Deficiencies			Corrective Action			
Requirements	States/facilities	Description	Date first reported	Remarks	Description	Executing body	Target date for completion	Priority for action**
<u>Non Provision of Safety-related Data</u>								
Requirement of Paragraph 3.3.4.1 of Annex 11	Bangladesh	Annex 11 requirement not implemented.	21/8/06		Bangladesh - provide the safety-related data as required.	Bangladesh	TBD	A
	Lao PDR	Annex 11 requirement not implemented.	21/8/06		Lao PDR - provide the safety-related data as required.	Lao PDR	TBD	A
	Myanmar	Annex 11 requirement not implemented.	21/8/06		Myanmar - provide the safety-related data as required.	Myanmar	TBD	U
	Papua New Guinea	Annex 11 requirement not implemented.	21/8/06		Papua New Guinea - provide the safety-related data as required.	Papua New Guinea	TBD	U

**AGENDA ITEM 9: UPDATE THE LIST OF
ATM/AIS/SAR TASKS
TOGETHER WITH PRIORITIES**

Agenda Item 9: Update the list of ATM/AIS/SAR Tasks together with priorities

9.1 The meeting recalled that APANPIRG/17 further updated the Task List of ATM/AIS/SAR/SG/16 and had included additional Task List entries resulting from Decision 17/1 requiring that the ALLPIRG/5 Conclusions 5/2, 5/4, 5/5, 5/7, 5/8, 5/9, 5/11, and 5/13 be studied by the ATM/AIS/SAR Sub-Group and action be taken to implement them. These items had been added to the Task List by the Secretariat for review by the meeting. Additionally, the meeting agreed that the full text of the relevant ALLPIRG/5 and AN-Conf11 decisions should be included as attachments to the Task List.

9.2 The meeting recalled that in undertaking the review of the Task List, ATM/AIS/SAR/SG/16 had recognized that the Task List was in need of a complete overhaul in order to ensure that it remained fit for the purposes for which it was intended. ATM/AIS/SAR/SG/16 considered that the Task List carried a large number of out of date references, inappropriate task items and was not presented in a “user-friendly” format. Accordingly, a task was added requiring the Secretariat to conduct a complete update of the Task List for presentation to the next Sub-Group meeting.

9.3 In this respect, the Secretariat had prepared a “new format” Task List for review by the meeting, incorporating ICAO Strategic Objectives and GPI-s as well as other guidance attempting to align the Sub Group Task List with the new ICAO business planning practices.

9.4 Following a review of the new format Task List, it was rejected by the meeting. The meeting found the new format to be too cluttered and too high level, resembling a Key Priorities list rather than a working list intended to effectively support the implementation work programme of the Sub Group. The inclusion of Strategic Objectives and GPIs was considered to be more suitable for policy making forums like APANPIRG but did not assist at the working group level. Language like “Contributing Task”, “Benefits” and “Deliverables” was confusing and disguised the core activities that were to be completed.

9.5 Agreeing that the previous format Task List was also not suitable, the meeting requested that the Secretariat attempt to compile a simplified Task List that reflected the specific work item to be undertaken, responsible party, target date and remarks column. The objectives specified by the meeting were that the Task List be simple, functional, uncluttered and able to be effectively used to progress the work programme of the Sub Group.

9.6 The Secretariat would attempt to construct a Task List meeting these objectives for review by the next meeting of the Sub Group. In the interim, the meeting agreed to retain both the old Task List and the new format Task List to ensure that work items were not misplaced.

9.7 The Task Lists reviewed by the meeting are provided at **Appendices A and B** to the Report on Agenda Item 9, and the meeting formulated the Draft Decision below. The meeting also agreed that the relevant Conclusions and Recommendations from ALLPIRG/5 and the 11th Air Navigation Conference (shown at **Appendices C and D** to the Report on Agenda Item 9 respectively) should be carried as attachments to the ATM/AIS/SAR/SG Task list for ease of reference

Draft Decision 17/21 – ATM/AIS/SAR Subject/Task List

That, the ATM/AIS/SAR Subject/Task Lists as contained in **Appendices A and B** to the ATM/AIS/SAR/SG/17 Report on Agenda Item 9 be adopted as the current work programme for the ATM/AIS/SAR Sub-Group.

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SUBJECT/TASKS IN THE ATM/AIS/SAR FIELDS

The priorities assigned in the list have the following connotation:

A = Tasks of a high priority on which work should be expedited;

B = Tasks of a medium priority on which work should be undertaken as soon as possible but not to the detriment of Priority “A” tasks; and

C = Tasks of a medium priority on which work should be undertaken as time and resources permit but not to the detriment of Priority “A” & “B” tasks.

(Updated 30/06/06)

No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
1	RAN/3 C 6/9 R 14/22 APANPIRG C 2/22 C 3/24 C 4/4 C 4/5 C 5/2 C 5/3	Subject: Implementation of RNP Task: Implement RNP into the Asia Pacific Region	A	a) Identify routes and areas where RNP implementation is required; and b) — monitor progress. Note: a) RNP10 (60 NM) implemented South China Sea route network November 2001; b) RNAV EMARSSH Route network implemented November 2002; c) RNP4 implemented January 2005 in Honiara FIR, Nauru FIR and portions of Brisbane FIR, Nadi FIR and Auckland Oceanic FIR; and d) RNP4 Trial in portions of Oakland FIR commenced December 2005	ATM/AIS/SAR/SG Regional Office	On-going
2	APANPIRG C 3/22	Subject: Traffic congestion within the region Task: Suggest ways of reducing this congestion by means of appropriate traffic management	A	a) Identify routes and areas where management of traffic congestion is required; and c) — Monitor r progress. Note: The BBACG established the ATFM/TF to address congestion in the Bay of Bengal and Indian airspace. An operational trial using an automated ATFM system to commence on 22 December 2005 in July 2006	ATM/AIS/SAR/SG Regional Office	On-going

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
3	RAN/3 C 13/14 APANPIRG D 2/35	Subject: AIS Automation Task: Develop a Regional AIS Automation Plan ~~Note: To progress this task, the AIS/TF/1 meeting is tentatively scheduled on 7-11 November 2005. Due to Regional Office ATM staff reduction, was unlikely to be convened. ATM/AIS/SAR/SG/15 agreed (Decision 15/8) that the Task Force must commence. States (Japan) would convene and run the Task Force, Regional Office to assist if able.~~		Develop AIS automation plan and introduction of AIS quality systems and AIS databases and consider issues arising from the use of public internet for AIS Note: APANPIRG Decision 14/8 reactivated the AIS Automation Task Force and changed the name and role of the task force to the AIS Implementation Task Force (AITF). First meeting expected November 2004 First meeting of the AIS Task Force and associated AIS Seminar was held 20-24 March 2006	AITF ATM/AIS/SAR/SG	On-going
4	~~APANPIRG C 2/34~~	~~Subject: Provision of AIS within the Region Task: Examine and comment on the provision of AIS and develop a programme to improve the provision of AIS within the region Note: AIS/MAP and one ATM Regional Officer posts removed from Regional Office establishment, effective 2005. No ability of Regional Office to assist with AIS matters. States will convene AIS Implementation Task Force in November 2005 to consider AIS matters, as described under Task list Item 3 above.~~	~~B~~	~~a) Increase AIS support from the ICAO APAC Office b) Regional AIS seminars to be conducted periodically c) Review the use of Internet for aeronautical information taking into account results of the ICAO AUPJ Study Group and update Chapter 4 to the AIS Guidance Manual~~	~~APANPIRG ICAO ICAO AATF ATM/AIS/SAR/SG~~	~~On going On going Dec. 2002 No update avbl to ATM/AIS/ SAR/SG/14 re internet~~
5	APANPIRG C 3/24 C 9/3 D 9/4	Subject: Implementation of RVSM in the Asia Pacific Region Task: Plan for and facilitate implementation of RVSM, as appropriate, in the Asia Pacific Region	A	a) Plan schedule and facilitate implementation of RVSM in the Asia Pacific Region b) RVSM implementation for the international airspace in the APAC Region ~~is in its final stage~~ has been completed with implementation in the Incheon, Naha and Tokyo FIRs on 29 September 2005. ~~c) Follow up meetings required for b); 90 day review and one year review; 90 Day review of Japan/ Republic of Korea implementation conducted 27 Feb- 1 Mar 2006. One year review scheduled November 2006.~~ ~~d) The South China Sea/West Pacific RVSM FLOS review to be completed and a meeting scheduled in January/February 2006 was held 24-28 April 2006 however no result. ATM/AIS/SAR/SG/16 (June 2006) recommended establishing a RVSM Scrutiny Group with TOR also addressing FLOS~~	RVSM/TF	On-going ~~North Asia 2005~~

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
6	APANPIRG D 3/12 D 3/2 C 4/2	Subject: Inappropriate provision of SAR facilities, services and procedures within the Asia Pacific Region Task: a) Review SAR facilities, services and procedures in the region e) Assist States without SAR services to provide SAR coverage	A	a) Encourage States to delegate or negotiate SAR services b) Identify deficiencies Note: Future ICAO SAR activities in the APAC Region constrained due to Regional Office ATM staffing levels.	ICAO ATM/AIS/SAR/SG	On-going On-going
7	APANPIRG ~~D 3/21~~ ~~C 9/2~~	Subject: ~~Transition to WGS 84 in the Asia Pacific Region~~ Task: ~~Monitor and facilitate the transition to WGS 84~~	~~A~~	~~a) Maintain status report of WGS 84 implementation within the Asia Pacific Region~~ ~~b) Identify States requiring assistance and where possible assist those States~~ ~~c) Identify deficiencies~~ ~~Note: Substantially complete, remaining issues being managed by the APANPIRG Deficiencies List~~	~~ATM/AIS/SAR/SG~~ ~~States~~ ~~ICAO~~ ~~ATM/AIS/SAR/SG~~ ~~ATM/AIS/SAR/SG~~	~~On-going~~ ~~On-going~~ ~~On-going~~
8	RAN/3 R 14/13 APANPIRG C 5/12 D 6/21 C 9/8	Subject: Implementation of ATS route requirements	B	~~a) Identify ATS route requirements~~ b) Monitor progress of route implementation in APAC Region c) Identify deficiencies Note: APANPIRG Decision 14/4 created the ATS Route Network Review Task Force (ARNR/TF). ATM/AIS/SAR/SG/14 referred matters on the deficiencies list relating to ATS routes to the ARNR/TF for study. First meeting of ARNR/TF expected September 2004. The ARNR/TF held its first meeting on 6-10 September 2004 and completed its work at ARNR/TF/3 on 2-3 May 2005. Note: Asia/Pacific ATS Route Catalogue established, maintained by Regional Office, Version 3 (June 2006) on ICAO website, ATS Routes included as standing agenda item on ATS Coordination Group agendas	ATM/AIS/SAR/SG	On-going On-going On-going

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
9	C 11/8	SAR Capability Matrix That, a) the “SAR Capability Matrix” be distributed to States for information and action as appropriate; and b) States provide information to ICAO by 30 April each year to permit the periodic update of the Matrix.	C	a) The SAR Matrix is reviewed by States at all ATM/AIS/SAR/SG Meetings b) States to update the Matrix by providing information to ICAO by 30 April each year Note: Matrix routinely updated during meetings of ATM/AIS/SAR/SG	ATM/ASI/SAR/SG States ICAO	On-going On-going
10	RAN/3 R 7/18 APANPIRG C 8/9	Subject: SAR training and exercises Task: Facilitate SAR training and exercises	B	a) Co-ordinate SAR training available in the region b) Facilitate international participation in SAR exercises c) Bay of Bengal Seminar and SAREX was held at Chennai on 7-11 March 2005 Note: APANPIRG/16 raised Conclusion 16/23 in respect of SAR SIP for Pacific Island States, SIP is approved by Council, scheduled last quarter 2006	ICAO States India	On-going 2003 On-going 2005 Completed
11	APANPIRG C 6/13 C 11/9	Subject: Appropriate SAR legislation, National SAR Plans and Amendments Task: Establish appropriate documentation and National SAR Committee	A	a) Implement appropriate legislation, establish National SAR Committees and Plans to support SAR operations b) Monitor developments of SAR Agreements between SAR organizations c) Establish and maintain a Register of SAR Agreements Note: Register of SAR Agreements routinely updated during meetings of ATM/AIS/SAR/SG	States ATM/AIS/SAR/SG ICAO	On-going On-going On-going
12	APANPIRG C 9/9	Subject: Lack of consideration of Human Factors in the provision of ATS Task: Consider ways by which Human Factors aspects in the provision of ATS within the region could be improved	B	a) States to Provide input including lessons learned (ICAO to encourage States to submit reports) b) ICAO to conduct seminars Note: ATM/AIS/SAR/SG/15 noted limited ATM resources remaining at the Regional Office and that presently ICAO Headquarters taking primary carriage of Human Factors activities.	States ICAO ICAO	On going 2004 On going Closed as ICAO HQ has primary carriage of these matters

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
13	APANPIRG D 8/	Subject: Maintenance of the CNS/ATM/GM for the Region	B	Note: ATM/AIS/SAR/SG/15 noted that ICAO Headquarters has taken over development of global guidance material and the status of the APAC Regional Guidance to be reviewed subsequent to provisions of global material under development. ATM/ASI/SAR/SG/16 raised draft Decision 16/3 in company with CNS/MET/SG/10 to establish APANPIRG Regional Planning Review Task Force to conduct this work	ATM/AIS/SAR/SG States	Ongoing
14	APANPIRG C 9/48 C 10/39 C 10/40	Subject: Deficiencies in the field of air navigation Task: Develop and maintain Deficiencies list	A	a) Identify unimplemented items in the BANP b) Review mission reports c) Analyze differences from SARPs d) Review accidents / incidents Note: ALLPIRG/5 (March 2006) raised Conclusion 5/15 in respect of "Last Resort" action to resolve deficiencies.	ATM/AIS/SAR/SG ICAO	On-going On-going On-going On-going
15	APANPIRG/12	Subject: Lateral Offset Procedures	A	~~a) Identify issues regarding route structures where offsets could be applied~~ ~~b) Implement 2 NM right of route offsets in accordance with ICAO guidelines~~ Note: Significant implementations of 2 NM lateral offset procedures occurred on 20 January 2005 and 17 March 2005 in Asia/Pacific.	ATM/AIS/SAR/SG States	On going 2004 2005/2006 Completed

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
16	APANPIRG/13 C12/6	Subject: Regional Contingency Planning Survey Task: That, ICAO survey States in the Asia/Pacific Region to determine the status of contingency planning and the extent to which contingency plans are exchanged between neighboring States.	C	a) States to complete their State Contingency Plans, using framework supplied in their Y2K CP b) Coordinate with neighboring States c) Send copy of their Contingency Plan to ICAO d) Regional Office initiated survey in March 2005 with results submitted by States by 30 June 2005, and results being studied Updated survey results will be reviewed by APANPIRG/17 Note: APANPIRG/16 raised Conclusion 16/15 in respect of SIP for APAC State. SIP will be conducted in Indonesia during July 2006	ICAO/States	On-going On-going On-going On-going
17	C 15/52	Review key priorities for implementation of CNS/ATM systems for the ASIA/PAC region, identify new items as required and monitor implementation	A	Review key priorities and recommend appropriate actions	ATM/AIS/SAR/SG ICAO/States	On-going
18	Decision 1/3 APANPIRG/15 C 15/49	Make recommendation aimed at improving ATM and CNS support for Terminal Area and Airport Operations, respectively.	B	a) Study operational problems being experienced; b) identify requirements/areas for improvement from States	ATM/AIS/SAR/SG States	On-going Ongoing
19	APANPIRG/15 C 15/46	That recommendations 1/1, 1/10, 1/13, 4/1, 4/2, 6/11 and 7/1 of AN-Conf/11 be studied by the ATM/AIS/SAR/SG, and action be taken to implement them.	B	Review recommendations and take appropriate action to implement	ATM/AIS/SAR/SG ICAO/States	On-going
20	APANPIRG/15 Paragraph 2.1.151	To monitor environmental issues relating to the implementation of CNS/ATM systems, in particular the work of ICAO's Committee on Aviation Environmental Protection (CAEP), to disseminate relevant information to contracting States, and to carry out appropriate coordination with Contracting States.	B	~~Monitor the work of the ARNR/TF in this respect~~	ATM/AIS/SAR/SG ICAO/States	On-going
21	APANPIRG/15 Paragraph 2.1.151	Develop a framework for regional training plans for the introduction of CNS/ATM systems and to include this material in the "Asia/Pacific Regional Plan for the New CNS/ATM Systems".	B	Review regional training plans and requirements	ATM/AIS/SAR/SG ICAO/States	On-going

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No.	Reference	Subject/Task	Priority	Action Proposed / In Progress	Action By	Target Date
22	APANPIRG/15 Paragraph 2.1.151	Develop business cases for various options of CNS/ATM implementation taking into account environmental benefits.	B	Coordinate with Regional Officer Air Transport in respect of business case activities	ATM/AIS/SAR/SG ICAO/States	On-going
16/1	ATM/AIS/SAR/SG/16 (June 2006)	Overhaul Task List of ATM/AIS/SAR Sub-Group of APANPIRG and present to ATM/AIS/SAR/SG/17 for adoption	A	ATM/AIS/SAR/SG/16 recognized that the task list was in need of a complete overhaul as it carried large number of out of date references, inappropriate task items and was not presented in a “user-friendly” format. Overhaul of Task List should ensure that all actions arising from ATM/AIS/SAR/SGs 15 & 16 and APANPIRGs 16 & 17 were captured	Regional Office	June/July 2007
16/2	ATM/AIS/SAR/SG/16 (June 2006) & DGCA/06	Subject to advice from ICAO Headquarters and APANPIRG, implement actions arising from the Conclusions of DGCA/06 (March 2006), including Conclusion and Recommendation 2/2 a) and b) in relation to the implementation of safety management systems by States.	A	Outcomes of DGCA/06 will be reviewed by APANPIRG/17 and subsidiary tasks for action by ATM/AIS/SAR/SG are expected to be identified	ATM/AIS/SAR/SG ICAO/States	On-going
16/3	ATM/AIS/SAR/SG/16 (June 2006) & DGCA/06	Take action in respect of APANPIRG/17 Decision 17/1 in relation to implementation of actions arising from the Conclusions of ALLPIRG/5 (March 2006)	A	APANPIRG/17 identified ALLPIRG/5 Conclusions 5/2, 5/4, 5/5, 5/7, 5/8, 5/9, 5/11 and 5/13 for study by ATM/AIS/SAR/SG.	ATM/AIS/SAR/SG ICAO/States	On-going

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ATM/AIS/SAR Sub-Group of APANPIRG

SUBJECT/TASKS IN THE ATM/AIS/SAR FIELDS (*New Format*)

(last updated July 2007 – ATM/AIS/SAR/SG/17)

No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/1	RNP/South East Asia Implementation	A - Safety D - Efficiency GPI-5 Performance based navigation GPI-8 Collaborative airspace design and management	Develop strategic, benefits-driven implementation plans in collaboration with stakeholders, to improve en-route airspace efficiency by means of reduced horizontal separation based on RNP operations within the Southeast Asia area, ensuring inter-regional harmonization.	Reduced longitudinal separation on RNAV routes from 80 NM to 50 NM based on RNP 10	Develop a Task List for the Task Force, with a view to implementing separation minima based on RNP 10 in Southeast Asia.	On-going (The first RNP-SEA/TF was held between 13-15 March 2006)	Chairman Mr. vPeter Rabot (Singapore) Members of RNP-SEA/TF	
17/2	Air Traffic Flow Management Implementation	A - Safety C - Environmental Protection D - Efficiency GPI-6 Air traffic flow management GPI-8 Collaborative airspace design and development GPI-16 Decision support and alerting system	States to consider and implement aspects of air traffic flow management (ATFM) including: a) centralized ATFM b) inter-regional cooperative ATFM; c) establishment of ATFM databases; d) application of strategic ATFM planning; and e) application of tactical ATFM planning f) assessment of economic and environmental impact of the implementation of the ATFM system.	Reduced ground and enroute delays; Enhanced traffic flows; Reduced reroutes and unplanned diversions; Fuel saving	ATFM Operational Trials in the Bay of Bengal and South Asia commenced July 2006, permanent implementation July 2007	ATFM system will be permanently implemented in BOB and South Asia from 5 July 2007	Members of ATFM/TF	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/3	AIS Implementation Task Force	A - Safety D - Efficiency GPI-18 Aeronautical information	Develop AIS implementations plans for introduction of AIS quality systems and AIS databases and consider issues arising from the use of public internet for AIS Study means of aeronautical data management by civil aviation authorities and/or ATS providers in other regions including the aeronautical information exchange model (AIXM) and the electronic AIP (eAIP), and consider the feasibility in making use of these methods/models in the Asia/Pacific Region;	Assisting States in AIS matters to consistently provide products that meet customer and applicable regulatory requirements	Develop Regional AIS Automation Plan, training material and conduct workshops on the Guidance Manual for AIS in the Asia/Pacific Region	On -going	Chairman Mr. Peter Hobson, (Australia) Members of AITF	
17/4	RVSM Implementation	C - Environmental Protection D - Efficiency GPI-2 Reduced vertical separation minima	Plan for and facilitate implementation of RVSM, as appropriate, in the Asia/Pacific Region Assist China in implementing 300 metre metric RVSM in their airspace as requested at 43 rd DGCA Conference Address concerns in relation to the modified single alternate FLOS in the SCS and interfaces with surrounding single alternate FLOS.	Increased airspace capacity; Reduced enroute delays; Enhanced fuel efficiency	RVSM implementation for the international airspace in the APAC Region has been completed –with implementation in the Incheon, Naha and Tokyo FIRs on 29 September 2005. China metric RVSM programme, proposed implementation on 22 November 2007 Scenario 3 FLOS agreed in-principle at WPAC/SCS RSG/2 June 2007	On -going	Mr. Kuah Kong Beng (Singapore) Members of RVSM/TF Mr David Maynard (USA) Members of WPAC/SCS RSG	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/5	Ensure appropriate provision of SAR facilities, services and procedures within the Asia Pacific Region SAR Capability Matrix	A - Safety GPI- None applicable	An Asia/Pacific “SAR Capability Matrix” be established, kept up to date and distributed to States for information and action as appropriate Review SAR facilities, services and procedures in the region Assist States without SAR services to provide SAR coverage Facilitate SAR training and exercises including international participation in SAR exercises	Evaluate States’ ability to provide SAR services Encourage States to delegate or negotiate SAR services Co-ordinate SAR training available in the region	States provide information to ATM/AIS/SAR/SG each year to permit the periodic update of the Matrix.	On-Going	States Regional Office ATM/AIS/SAR/SG	
17/6	Implementation of ATS route requirements	C - Environmental Protection D - Efficiency GPI- 8 Collaborative airspace design and management	Identify ATS route requirements Monitor progress of route implementation in APAC Region Maintain Asia/Pacific ATS Route Catalogue on ICAO Regional Office website ATS Routes included as standing agenda item on ATS Coordination Group agendas	Implementation of new ATS routes in accordance with the requirements of both users and ANSPs	Regular review of requirements and implementation of ATS routes	On-Going	States Regional Office IATA	
17/7	Identify Deficiencies in the fields of air navigation	A - Safety D - Efficiency GPI – None applicable	Develop and maintain Deficiencies list, Identify unimplemented items in the BANP	Promote timely resolution of safety-critical items identified by APANPIRG	Deficiencies list, Analyze differences from SARPs	On-Going	States ATM/AIS/SAR/SG APANPIRG	ALLPIRG/5 (March 2006) raised Conclusion 5/15 in respect of “Last Resort” action to resolve deficiencies

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/8	Regional ATM Contingency Planning	A - Safety D - Efficiency GPI- None applicable	Prepare ATM Contingency Plans based on model (Indonesia) adopted by APANPIRG/17 a) Coordinate with neighboring States to prepare plans b) Send copy of ATM Contingency Plan to ICAO	Determine the status of contingency planning and the extent to which contingency plans are exchanged between neighboring States	APANPIRG17 raised Conclusion 17/11 as the results of the survey, adopting the National ATM Contingency Plans of Jakarta and Ujung Pandang FIRs as a model for Asia/Pacific States in the preparation of national ATM contingency plans.	On-Going	States Regional Office	
17/9	Environmental issues relating to the implementation of CNS/ATM systems	C - Environmental Protection GPI- None applicable	To monitor environmental issues relating to the implementation of CNS/ATM systems, in particular the work of ICAO's Committee on Aviation Environmental Protection (CAEP),	Raise States' level of Environmental Protection Awareness	Disseminate relevant information to contracting States, and to carry out appropriate coordination between Contracting States.	On-Going	States Regional Office ATM/AIS/SAR/SG	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/10	Develop business cases for various options of CNS/ATM implementation taking into account environmental benefits.	C - Environmental Protection D - Efficiency GPI- None applicable	Coordinate with Regional Officer Air Transport in respect of business case activities		Guidance Document	On-Going	States Regional Office	Regional Office Air Transport position vacant since Feb 2007
17/11	Review key priorities for implementation of CNS/ATM systems for the ASIA/PAC region, identify new items as required and monitor implementation	A - Safety C - Environmental Protection D- Efficiency GPI- - All	Review key priorities and recommend appropriate actions	Identify areas within the Region where CNS/ATM Implementation would be of immediate benefit	Recommendation on CNS/ATM implementation	On-going	States Regional Office ATM/AIS/SAR/SG IATA	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/12	Operation of Unmanned Aircraft Systems (UASs)	A - Safety D- Efficiency GPI – None applicable	Study the operation of UASs and their impact on safety especially in mixed environments. States to provide information on UAS activities that impact on safety concerns Provide information to the ICAO Study Group on UASs (UASSG)	Raise States' and Operators' awareness of the UASs operations and the regulatory development	Information to States in regard to ICAO developments to regulate UAV activities	On-going	States Regional Office ATM/AIS/SAR/SG	
17/13	Follow up relevant Action Items from annual conference of Asia/Pacific Directors General	All Strategic Objectives, All GPIs	Review List of Action Items from annual DGCA Conference and assist implementation where appropriate	Accelerated implementation of DGCA action items	Implementation activities in support of DGCA action items	On-going	States Regional Office ATM/AIS/SAR/SG	
17/14	Follow up action on the Conclusions of ALLPIRG/5 (March 2006)	All Strategic Objectives, All GPIs	Take action in respect of APANPIRG/17 Decision 17/1 in relation to implementation of actions arising from the Conclusions of ALLPIRG/5	Accelerated implementation of ALLPIRG/5 Conclusions	Study and take appropriate action on ALLPIRG/5 Conclusions 5/2, 5/4, 5/5, 5/7, 5/8, 5/9, 5/11 and 5/13.	On-going	States Regional Office ATM/AIS/SAR/SG	
17/15	Follow up action on the Conclusions of AN_Conf11 (2003)	All Strategic Objectives, All GPIs	Take action in respect to implementation of actions arising from the Recommendations of AN_Conf11	Accelerated implementation of AN_Conf11 recommendations	To study and implement recommendations 1/1, 1/10, 1/13, 4/1, 4/2, 6/11 and 7/1 of AN-Conf/11	On-going	States Regional Office ATM/AIS/SAR/SG	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/16	ATM and CNS support for Terminal Area and Airport Operations	A - Safety D - Efficiency GPI-8 Collaborative airspace design and management GPI-10 Terminal area design and management, GPI-11 RNP and RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs) GPI-12 Flight Management System (FMS) – based arrival procedures GPI-14 Runway operations	Make recommendation aimed at improving ATM and CNS support for Terminal Area and Airport Operations Study operational problems being experienced Identify requirements/areas for improvement from States	Implementation of ICAO Performance Based Navigation (PBN) provisions		On-going	States Regional Office ATM/AIS/SAR/SG	

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No.	Contributing Task	ICAO Strategic Objective & Associated GPI	Tasks/Strategy	Benefits	Deliverables	Target Date	Leader& Supporting Members	Remarks
17/17	Framework for regional training plans for the introduction of CNS/ATM systems		Develop a framework for regional training plans for the introduction of CNS/ATM systems and to include this material in the “Asia/Pacific Regional Plan for the New CNS/ATM Systems”.		Review regional training plans and requirements Update the “Asia/Pacific Regional Plan for the New CNS/ATM System” to include regional training plans and requirements	On-going	States Regional Office ATM/AIS/SAR/SG	

FOLLOW-UP BY ATM/AIS/SAR Sub Group ON CONCLUSIONS OF ALLPIRG/5 (March 2006)

ALLPIRG/5 Conclusions	Relationship with Strategic Objective & Global Plan Initiatives (GPIs)	Follow-up task	Follow-up to be initiated by
Conclusion 5.2 — Implementation of Global Plan Initiatives (GPIs)			
That, recognizing that the evolution continues from a systems-based to a performance-based approach to planning and implementation of the air navigation infrastructure, the regional planning groups:	Increases efficiency (Strategic objective D) Relates to all GPIs		
a) note that the Global Plan is a significant component in the development of regional and national plans and that, together with the global ATM operational concept, provide an effective architecture for achieving a harmonized and seamless Global ATM system;		Note that the Global Plan is a significant component in the development of regional and national plans	APANPIRG, States and international organizations
b) identify GPIs that most closely align with the well established implementation plans of their respective regions;		Identify GPIs that most closely align with the implementation plans of their respective regions	APANPIRG, States and international organizations
c) select GPIs that would be most effective in achieving the objectives of the region while ensuring continuation of the work already accomplished;		Select GPIs that would be most effective in achieving the objectives of the region	APANPIRG, States and international organizations
d) implement GPIs that take into account the Initiatives across regions, to align work programmes and to develop national and regional plans that facilitate achieving a Global ATM system;		Implement GPIs in the development of national and regional plans	APANPIRG, States and international organizations
e) utilize the planning tools as the common planning and implementation mechanism, thereby ensuring proper coordination and global integration; and		Utilize the planning tools as the common planning and implementation mechanism	APANPIRG, States and international organizations
f) review, at each PIRG meeting as a part of its regular agenda, the progress achieved and challenges identified in the implementation of GPIs using a common template.		Review, at each PIRG meeting as a part of its regular agenda, the progress achieved and challenges identified in the implementation of GPIs	APANPIRG

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ALLPIRG/5 Conclusions	Relationship with Strategic Objective & Global Plan Initiatives (GPIs)	Follow-up task	Follow-up to be initiated by
Conclusion 5/4 — Application of the business case model for CNS/ATM systems implementation			
That PIRGs, States and airspace users:	Increases efficiency (Strategic objective D) Relates to all GPIs		
a) note that business cases for the implementation of CNS/ATM systems leading to a global ATM system is a key element in the development of regional, subregional and national plans;		Note that business cases for the implementation of CNS/ATM systems is a key element in the development of regional, subregional and national plans	APANPIRG, States and international organizations
b) consider the application of the model for the development of business cases in the formulation of national and subregional plans with a view to facilitating the achievement of a global ATM system; and		Apply the model for the development of business cases in the formulation of national and subregional plans	APANPIRG, States and international organizations
c) establish, with ICAO's assistance and within the limits of the programme budget, a network of experts on cost-effectiveness, cost-benefit analyses and business cases for the implementation of CNS/ATM systems in order to share expertise and to provide assistance to the Regional Offices.		Establish a network of experts on cost-effectiveness, cost-benefit analyses and business cases for the implementation of CNS/ATM systems	ICAO Headquarters
Conclusion 5/5 — ICAO Global air navigation plan (ANP) database and geographic information system (GIS) portal			
Recognizing that access to an ICAO Global ANP database and associated planning services through an web-based ICAO GIS portal would constitute an invaluable tool in supporting, integrating and monitoring the planning and implementation of harmonized regional, interregional and global air navigation infrastructures, the regional planning groups:	Increases efficiency (Strategic objective D) Relates to all GPIs		
a) note the progress made by the Secretariat in accordance with Recommendation 1/14 of AN-Conf/11 and the ICAO Global ANP database;		Note the progress made in the development of ICAO Global ANP database	APANPIRG, States and international organizations

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ALLPIRG/5 Conclusions	Relationship with Strategic Objective & Global Plan Initiatives (GPIs)	Follow-up task	Follow-up to be initiated by
b) note the ongoing efforts by the Secretariat in harmonizing formats of all the ANP tables together with the inclusion of temporal information in the tables that would assist the regional planning groups in monitoring and analysing the implementation progress;		Harmonize formats of all the ANP tables	ICAO Headquarters
c) note the intent to expand the ANP tables to include Global Plan Initiatives (GPIs), as appropriate; and		Include GPIs in the ANP tables	ICAO Headquarters
d) utilize, through the ICAO GIS portal, the ICAO Global ANP database and associated planning services so as to ensure the currency, coordination and implementation of regional air navigation planning and to contribute to the further development of air navigation plans as the framework for the efficient implementation of new air navigation systems and services at the national, regional, interregional and global levels.		Utilize the ICAO Global ANP database and associated planning service	APANPIRG, States and international organizations
Conclusion 5/7 — Environmental benefits of CNS/ATM systems			
That PIRGs and States:	Minimizes environmental impact (Strategic objective C)		
a) use the Committee on Aviation Environmental Protection (CAEP) provided CO ₂ conversion factor in the analysis of environmental benefits of implementing CNS/ATM systems;		Use the CAEP provided CO ₂ conversion factor in the analysis of environmental benefits of implementing CNS/ATM systems	APANPIRG, States and international organizations
b) prioritize the implementation of voluntary, operationally-based improvements in their air traffic management systems, with emphasis on fuel savings, emissions reductions and noise benefits, and also to mitigate costs to the industry;		Prioritize the implementation of voluntary, operationally-based improvements in their air traffic management systems	APANPIRG, and States
c) provide feedback to ICAO on studies conducted on the environmental benefits of implementing CNS/ATM systems; and		Provide feedback to ICAO on studies conducted on the environmental benefits of implementing CNS/ATM systems	APANPIRG, States and international organizations
d) share air traffic data to improve future CAEP assessments, in line with State letter AN 1/17-03/86.		Share traffic data with CAEP	APANPIRG, States and international organizations

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ALLPIRG/5 Conclusions	Relationship with Strategic Objective & Global Plan Initiatives (GPIs)	Follow-up task	Follow-up to be initiated by
Conclusion 5/8 — Globally coordinated air traffic services (ATS) routes			
That PIRGs:	Increases efficiency (Strategic objective D) Relates to GPI 7		
a) establish a global consolidated, prioritized list of routes and terminal area (TMA) improvements in close coordination with airspace users; and		Establish a global consolidated, prioritized list of routes and terminal area (TMA) improvements	APANPIRG and States
b) work with neighbouring PIRGs/States/air navigation service providers (ANSPs) to accelerate international route improvements.		Work with neighbouring PIRGs/States/ANSPs to accelerate international route improvements	APANPIRG and States
Conclusion 5/9 — Terminal area (TMA) structure and area navigation			
That States:	Increases efficiency (Strategic objective D) Relates to GPI 5		
a) employ area navigation in all TMAs, including appropriate arrival and departure procedures, to improve efficiency and reduce emissions in the vicinity of airports; and that, in special cases where there are particularly challenging obstacles and where air traffic density is very high and additional approach paths are possible, the more precise and contained required navigation performance (RNP) procedures be employed; and		Employ area navigation in all TMAs, including appropriate arrival and departure procedures	States
b) review operations, procedures and training of controllers to ensure the optimum management of air traffic services.		Review operations, procedures and training of controllers to ensure the optimum management of air traffic services	States

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ALLPIRG/5 Conclusions	Relationship with Strategic Objective & Global Plan Initiatives (GPIs)	Follow-up task	Follow-up to be initiated by
Conclusion 5/11 — Air traffic management (ATM) safety management			
That ICAO:	Increases safety (Strategic objective A)		
a) urge States to give priority to the establishment and effective operation of their ATM safety management and safety regulatory functions;		Give priority to the establishment and effective operation of their ATM safety management and safety regulatory functions	States
b) support the development of sufficient expertise levels in the industry through formal training in ATM safety issues and, by cooperation through regional bodies, promote collective means to optimize the effectiveness of training provision; and		Develop formal training in ATM safety issues	States
c) develop further measures to enable the implementation of a “just-culture” reporting environment to facilitate the reporting of ATM occurrences.		Implement a “just-culture” reporting environment to facilitate the reporting of ATM occurrences	States
Conclusion 5/13 — Implementation of performance-based navigation concept			
That, to increase awareness and understanding of the performance-based navigation concept and its elements:	Increases efficiency (Strategic Objective D) Relates to GPI 5		
a) ICAO organize workshops and training activities; and		Organize workshops and training activities through the SIP mechanism	ICAO Headquarters
b) where area navigation (RNAV) or required navigation performance (RNP) implementations are required, these will be implemented by PIRGs and States according to the performance-based navigation concept.		Implement performance-based navigation concept	APANPIRG, States and international organizations

— END —

	RECOMMENDATION		ACTION	
	#	ITEM	BY ICAO/PIRGs/ STATES/IOs	ACTION/TASKS
AGENDA ITEM 1: INTRODUCTION AND ASSESSMENT OF A GLOBAL AIR TRAFFIC MANAGEMENT (ATM) OPERATIONAL CONCEPT				
1	1/1	Endorsement of the global ATM operational concept That: a) ICAO, States and planning and implementation regional groups (PIRGs), consider the global ATM operational concept as the common global framework to guide planning for implementation of ATM systems and to focus all ATM development work; b) the global ATM operational concept be used as guidance for development of ICAO CNS/ATM related provisions; c) States with the support of the other members of the ATM community undertake work to validate the seven components in the global ATM operational concept; d) ICAO, States and PIRGs develop transition strategies for implementation of ATM systems based on the global ATM operational concept; and e) ICAO align its technical work programme to facilitate future work related to the global ATM operational concept	PIRGs/States/ IOs PIRGs/States/ IOs States/IOs PIRGs/States ICAO	re (a) and (b): Consider the global ATM operational concept as the common global framework and use as guidance for the planning and implementation of CNS/ATM systems. Validate the seven components in the global ATM operational concept. Develop transition strategies based on the global ATM operational concept. Secretary General to align its technical work accordingly.

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	RECOMMENDATION		ACTION	
	#	ITEM	BY ICAO/PIRGs/ STATES/IOs	ACTION/TASKS
10	1/10	Status of the <i>Global Air Navigation Plan for CNS/ATM Systems</i> (Doc 9750) That States and planning and implementation regional groups (PIRGs) consider the <i>Global Air Navigation Plan for CNS/ATM Systems</i> (Doc 9750) as a catalyst for change, providing a global safety and interoperability framework while allowing regional or local adaptation to efficiently meet regional and local needs.	PIRGs/States/ IOs	To note the intent of the recommendation.
13	1/13	Harmonization of air navigation systems That ICAO and the ATM community explore the possibility of developing a mechanism for implementing the interregional interface applications with a view to facilitating the harmonized implementation of air navigation systems giving rise to a global ATM system in an evolutionary fashion.	PIRGs/States/ IOs	To identify interface issues and address them through appropriate interregional mechanism.

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	RECOMMENDATION		ACTION	
	#	ITEM	BY ICAO/PIRGs/ STATES/IOs	ACTION/TASKS
AGENDA ITEM 4: CAPACITY-ENHANCEMENT MEASURES				
29	4/1	Harmonization of air navigation systems between regions That ICAO: a) maintain, and develop further, a coordination mechanism between regions for planning and implementation of capacity-enhancing measures and ATM performance improvement between regions for a harmonized evolution aimed at enhancing aviation efficiency and safety; b) be systematically involved in any regional initiatives aiming at enhancing ATM capacity and performance; and c) urge States, who have not already done so, to establish national CNS/ATM coordination and implementation committees, with a point of contact to be made known to the respective ICAO Regional Office, so as to facilitate harmonized transition to CNS/ATM systems.	ICAO/PIRGs ICAO States	Develop further, a coordination mechanism between regions for a harmonized evolution aimed at enhancing aviation efficiency and safety. Noted. Establish national CNS/ATM coordination and implementation committees, with a point of contact to be made known to the respective ICAO Regional Office.
30	4/2	Investigation of performance-driven planning and implementation methods That States study the approach to planning and implementation commonly adopted by European States, with a view to the possible application of its elements in their respective regions.	PIRGs/States	Study the approach to planning and implementation commonly adopted by European States, with a view to the possible application of its elements.

	RECOMMENDATION		ACTION	
	#	ITEM	BY ICAO/PIRGs/ STATES/IOs	ACTION/TASKS
AGENDA ITEM 6: AERONAUTICAL NAVIGATION ISSUES				
51	6/11	Amendment to the Global Plan — Navigation That: a) the <i>Global Air Navigation Plan for CNS/ATM Systems</i> (Doc 9750) be amended as shown in Appendix C to the report on Agenda Item 6; and b) updated CNS/ATM systems implementation time lines contained in Part II of the Global Plan be reviewed by the Regional Implementation Group and consolidated for incorporation in the next edition of the Global Plan.	 ICAO PIRGs	 Requested the Secretary General to take appropriate action. Update CNS/ATM systems implementation time lines contained in Part II of the Global Plan.
AGENDA ITEM 7: AERONAUTICAL AIR-GROUND AND AIR-TO-AIR COMMUNICATIONS				
57	7/1	Strategy for the near-term introduction of ADS-B That States: a) note that a common element in most of the approaches currently adopted for early implementation of ADS-B is the selection of the SSR Mode S extended squitter as the initial data link; and b) take into account this common element to the extent possible in their national and regional implementation choices in order to facilitate global interoperability for the initial introduction of ADS-B.	 PIRGs/States PIRGs/States	 To note. Take into account this SSR Mode S extended squitter as a common element in their national and regional implementation choices for the initial introduction of ADS-B.

AGENDA ITEM 10: ANY OTHER BUSINESS

Agenda Item 10: Any other business

Second Inter-Regional Coordination Meeting (IRCM/2)

10.1 The meeting was provided with information on the Second Inter-Regional Co-Ordination Meeting (IRCM/2, September 2006) on interface issues between ICAO Asia/Pacific, European/North Atlantic and Middle East Offices, which was held at ICAO EUR/NAT Office, Paris, France.

10.2 The meeting reviewed a number of issues of relevance to the ATM/AIS/SAR/SG activities, raising action items accordingly. A copy of the full meeting report of IRCM/2 is available from the Regional Office website at <http://www.bangkok.icao.int/> under the “Meetings” menu.

Update of the Universal Safety Oversight Audit Programme (USOAP)

10.3 The Secretariat provided an update of the ICAO Universal Safety Oversight Audit Programme (USAOP), including tentative dates for audits in the Asia and Pacific Region during 2007-2008.

10.4 Since the adoption of the comprehensive systems approach on 1 January 2005, as of 30 April 2007, 48 audits had been conducted. The audits had been instrumental to establish the degree of implementation of the eight critical elements of a safety oversight system, to determine the status of States' compliance with ICAO SARPs and to identify areas of concern. Audit results had still revealed audit findings in the areas of personnel licensing, aircraft operations and airworthiness of aircraft; however, the majority of audit findings under the current cycle related to the new audit areas, i.e. aerodrome, air navigation services and aircraft accident and incident investigation.

State Corrective Action Plans

10.5 The meeting noted that in accordance with the Memorandum of Understanding (MOU) on safety oversight audits signed with ICAO, States should undertake to prepare and submit to ICAO, within 60 days from the date the interim safety oversight audit report had been made available to them, a corrective action plan addressing the findings and recommendations contained in the report, including the identification of specific actions, deadlines and the office(s) responsible for each action. As of 30 April 2007, all of the corrective action plans due following an audit under the comprehensive systems approach had been submitted to ICAO.

Deployment of Auditor Staff

10.6 Contracting States had supported the audit programme actively through the secondment of officials to ICAO. Since the launching of the comprehensive systems approach, seven States (Austria, France, Malaysia, Republic of Korea, Switzerland, United Kingdom and United States) had seconded experts to ICAO on a long-term basis. In addition, 19 States and 2 international organizations had seconded experts to ICAO on a short-term basis to take part in the conduct of audits. This valuable support from States would continue to be required throughout the entire audit cycle.

10.7 The meeting noted that ICAO's Safety Oversight Audit Section (SOA) had started deploying Standards and Procedures Officers – being ICAO staff members responsible for managing a portfolio of Contracting States and team leading audits to the ICAO Regional Offices – with a view to establishing improved coordination between Regional Offices and the ICAO headquarters and also to reduce mission costs.

Preparatory Seminars

10.8 The meeting noted that a new seminar format was developed in 2006 to assist States in their preparation for an upcoming audit and to allow them to exchange audit experiences with other States. Three such seminars had been delivered so far, including one at the request of a Contracting State, on a cost recovery basis. In all, 189 officials from thirty two States and one international organization participated in these seminars.

Asia/Pacific Audits

10.9 All States scheduled for a safety oversight audit in 2007 and 2008 had been provided with the official audit notification from ICAO. The meeting noted the USOAP tentative work programme for the next 18 months was available from the SOA section at ICAO Headquarters and proposes audits of Asia/Pacific States as follows (actual dates should always be confirmed with SOA):

• Cambodia	4 th quarter 2007
• Viet Nam	4 th quarter 2007
• Australia	1 st quarter 2008
• Marshall Islands	1 st quarter 2008
• Papua New Guinea	1 st quarter 2008
• Democratic People's Republic of Korea	2 nd quarter 2008
• Republic of Korea	2 nd quarter 2008
• Philippines	4 th quarter 2008
• Sri Lanka	4 th quarter 2008

Update on the ICAO Global Air Navigation Plan and ICAO's Strategic Objectives

10.10 The meeting reviewed the Third Edition of the Global Air Navigation Plan which was issued by ICAO in 2007 and contained a revision to the Global Plan Initiatives (GPI) that had been presented to the ATM/AIS/SAR/SG/16 (June 2006, Bangkok). The meeting noted that the GPIs contained in the Global Plan were designed to support performance objectives. Therefore, the GPIs were not meant to serve as the basis for separate implementation projects in and of themselves, but should support the implementation projects of the region which would be developed on the basis of the identified performance objectives.

10.11 The meeting also reviewed ICAO's Strategic Objectives that were adopted by the Council of ICAO on 14 December 2004 for the period 2005-2010 to implement the Organization's vision of safe, secure and sustainable development of civil aviation through cooperation amongst its member States.

10.12 The meeting noted that APANPIRG/17 had supported the revised Global Plan and the new approach to planning and implementation introduced, which included integrating the GPIs into the planning process and to maximize their usefulness as part of the ANP searchable database.

ICAO Website for the Flight Safety Information Exchange (FSIX)

10.13 The Secretariat drew the attention of the meeting to the ICAO Flight Safety Information Exchange (FSIX) website, which had been developed by ICAO to provide the aviation community with access to safety-related information. The website was now being updated on a regular basis and contains a very significant volume of information provided by both ICAO and Contracting States related to all aspects of aviation safety and related matters. Audit reports from the Universal Safety Oversight Audit Programme (USOAP) were also regularly posted to the site.

10.14 ICAO considers that cooperation between States and information exchange were essential elements for the success of any aviation safety-related activity, in pursuit of the common goal to improve aviation safety. This site at <http://www.icao.int/fsix/> was intended as a portal to existing safety related websites as well as a place to exchange information through various newsgroups.

Airbus A380 Wake Vortex – Revised Guidance Material

10.15 The meeting recalled that in November 2005 two State Letters were promulgated advising States to exercise considerable caution with regard to horizontal and vertical separation between A380 aircraft and other aircraft until more definitive guidance was provided by the ad hoc working group of experts studying the matter.

10.16 In late 2006, after the release of the report by the working group of experts under the auspices of the United States Federal Aviation Administration (FAA), the European Organization for the Safety of Air Navigation (Eurocontrol), the Joint Aviation Authorities and the manufacturer, the ICAO Asia and Pacific Office issued State Letter (Ref.: T3/4.4 – AP099/06 (ATM)). The State letter included revised guidance material on wake vortex separation criteria for A380 based on the completed flight test programme and current outcome of the work group, and strongly encouraged the implementation of this revised guidance as soon as possible.

North American Sustainment of Aviation Operations during a Pandemic Influenza Outbreak – A Concept of Operations and Agreement

10.17 The meeting was presented with the a common Concept of Operations (CONOPS) that will be used by the participating Canadian, Mexican, and United States (U.S.) departments and agencies to enhance shared situational awareness and operational coordination among the three States on pandemic influenza related containment efforts involving the North American aviation system.

10.18 The FAA stated that the CONOPS focuses on pandemic influenza events occurring onboard aircraft operating within, bound for, or departing North American airspace or operating at North American airports. While the efforts addressed by this document are necessarily coordinated with broader public health activities, the CONOPS principally addresses actions taken by the CAA, ANSP, airport authorities, security and customs agencies, and public health entities with regard to the safety and health of persons (e.g., air crew and passengers) onboard the aircraft indicated above, as well as containment efforts conducted while the same aircraft are en route or are on the ground at an airport.

Automating Operational Contingency Planning

10.19 The FAA presented information on its air traffic control (ATC) operational contingency plan (OCP) development, management and activation. The purpose of the OCP was to reduce the impact and risk to the National Airspace System (NAS) in the event a facility is unable to safely and efficiently provide ATC services as required by FAA directives and orders.

10.20 The Air Traffic Organization (ATO) Automated Contingency Tool 2 (ACT2) enabled all FAA and FAA contract ATC facilities to share their OCPs with one another in real time throughout the NAS. The OCP developed by each ATC facility outlines the roles and responsibilities and instructions for executing an OCP for the parent and supporting facility or facilities.

10.21 The FAA supports the ICAO global goal to have every State develop contingency plans for human or natural disasters that affect operations of civil air traffic.

10.22 The FAA is willing to assist the ICAO Asia Pacific Regional Office and interested States with the development of OCPs in the ACT2. Access to the ACT2 through appropriate international communications protocols will allow trained facility personnel to develop, manage, maintain and distribute national plans through secure networks that may not require new or additional hardware or software. Housing standardized OCPs in the ACT2 that may be quickly shared and reviewed by other affected border States will help to ensure the continuity of national aviation operations when a major outage occurs.

Civil Military Air Traffic Management Summit (CMAC '07)

10.23 The meeting was provided information by the US Department of Defense on the recently held CMAC '07. As the only conference of this type in the world, CMAC '07 was held 26 February 2007 – 1 March 2007 in Bangkok, Thailand. The summit, the first ever CMAC to be held in Asia, was hosted by Aeronautical Radio of Thailand (AEROTHAI) and jointly sponsored by the Air Traffic Control Association, American Association of Airport Executives, and the US Department of Defense; and supported by the US Federal Aviation Administration.

10.24 Over 40 countries participated in CMAC '07; and included Australia, China, Indonesia, Japan, Republic of Korea, Malaysia, Mongolia, Pakistan, Philippines, Singapore, Solomon Islands, Sri Lanka, and the host country of Thailand from the Asia/Pacific Region.

10.25 The meeting noted that CMAC '07 provided an opportunity for senior civil and military leaders discuss visions, opportunities and plans for civil/military collaboration to meet the evolving needs of worldwide air traffic management. The meeting was encouraged to have its delegates, along with their military counterparts, attend the CMAC '09 conference.

10.26 In noting that a State had not yet been identified to host the CMAC '09, the Secretariat requested that organizers consider a venue in Asia to facilitate attendance by delegates from Asia. This would assist in ensuring that the messages transmitted so well by the CMAC '07 would again be reinforced in the region.

**AGENDA ITEM 11: DATE AND VENUE FOR NEXT
MEETING**

Agenda Item 11: Date and venue for next meeting

11.1 The meeting agreed that the next ATM/AIS/SAR Sub-Group meeting would be held over 5 working days from 23 – 27 June 2008, at the Regional Office premises. The Regional Office would make appropriate arrangements and advise parties accordingly.

Closing remarks

11.2 In closing the meeting, the Chairman, Mr. Colman Ng, thanked all members for their active participation. During the week, the Sub-Group had altogether reviewed a total of 53 working papers, which was about a 70% increase over the 38 working papers reviewed by the Sub Group last year. Also, 19 information papers had been provided to the meeting this time. As a result, this meeting had formulated and endorsed more than 20 Draft Conclusions and Decisions for consideration by the APANPIRG/18 meeting in September 2007. Some joint conclusions had also been proposed for endorsement by the CNS/MET Sub Group, actively increasing the coordination between the two Sub Groups.

11.3 Mr. Ng took the opportunity to express thanks to each and every member for their efforts and contribution, particularly on the part of the AIS Group Side-Meeting that effectively helped to mitigate the workload of this Sub-Group. He commended all participants for their support in the past few days and hoped that the results of our deliberations in the Sub-Group meeting will shed light on resolving the issues at hand and provide sound guidance to APANPIRG/18. Mr. Ng also hoped that as a result of the discussions this week, member states are re-energized into tackling the outstanding issues with renewed vigor.

11.4 Mr. Ng particularly thanked the Secretariat for their excellent work. Out of the 53 working papers that had been covered, 36 were compiled and presented by the Secretariat, as were a number of the information papers. The draft report that had just been reviewed was produced by the Secretariat just hours after the close of the plenary sessions yesterday. This once again proved the usual efficiency of our ICAO Regional Office colleagues. Mr. Ng wanted to take this opportunity to express his heartfelt appreciation to them for the hard work that they have collectively put in to ensure the smooth conduct of this meeting. This work is indeed of immense value to achieving the objective of the APANPIRG on behalf of the region. Lastly, he wished all delegates a safe and pleasant trip back home.

— END —

ATTACHMENTS TO THE REPORT

List of Participants

	Name	Title/Organization	TEL/FAX/E-MAIL
1.	AUSTRALIA (2)		
	1. Mr. Tony Williams	Head, Airways Section Air Traffic Operations Group Civil Aviation Safety Authority GPO Box 2005 Canberra ACT 2601 Australia	Tel: +61-2-6217 1737 Fax: +61 2 6217 1500 E-mail: tony.williams@casa.gov.au
	2. Mr. Ken Ehrenberg	Strategic Program Leader – ATM Automation Airservices Australia GPO Box 1093 Tullamarine, Victoria 3043 Australia	Tel: +61-3 93392412 Fax: +61 3-93392442 E-mail: ken.ehrenberg@airservicesaustralia.com
2.	BANGLADESH (2)		
	3. Mr. Nurul Islam	Airport Manager (Jessore) Civil Aviation Authority of Bangladesh Headquarters Office Kurmitola Dhaka 1229 Bangladesh	Tel: +880 0421-64033 Fax: +880 (2) 891 3322 E-mail: dfsrcaab@accesstel.net
	4. Sqn.Ldr. Sajjad Hossain	Airport Manager (Chittagong) Civil Aviation Authority of Bangladesh Headquarters Office Kurmitola Dhaka 1229 Bangladesh	Tel: +880 (2) 891 1122 Or 088031-740900,088031-741679 Fax: +880 (2) 891 3322 E-mail: sajjadbaf@yahoo.com

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
3.	BRUNEI DARUSSALAM (2)		
	5. Mr. Yasin Bin Haji Apong	Briefing Officer Department of Civil Aviation Ministry of Communications Brunei International Airport Brunei Darussalam	Tel: +673-2330142 ext 1815 Fax: +673-2331730 E-mail: bo.ais.brunei@civil-aviation.gov.bn
	6. Mr. James Shie	Air Traffic Control Officer Department of Civil Aviation Ministry of Communications Brunei International Airport Brunei Darussalam	Tel: +673-2330142 ext 1837 Fax: +673-2331157 E-mail: jbshe@gmail.com
4.	CHINA (1)		
	7. Mr. Zhang Nan	Assistant of ATC Division ATMB, CAAC ATC Division, ATMB No.12 East San-huan Road Middle Chaoyang District Beijing China	Tel: +86-10-8778 6818 Fax: +86 10 8778 6810 E-mail: zhangnan@atmb.net.cn
5.	HONG KONG, CHINA (3)		
	8. Mr. Colman Ng, Shung-ching	Assistant Director-General (Air Traffic Management) Civil Aviation Department 4/F, Air Traffic Control Complex Hong Kong International Airport Hong Kong, China	Tel: +850-2910 6402 Fax: +850-2910 0186 E-mail: cscng@cad.gov.hk

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
	9. Mr. Lucius Wai-chuen Fan	Senior Safety and Quality Officer (Enroute) Civil Aviation Department 4/F, Air Traffic Control Complex Hong Kong International Airport Hong Kong, China	Tel: +850-2910 6448 Fax: +850-2910 0186 E-mail: lwcfan@cad.gov.hk
	10. Mr. John Wagstaff	Operations Officer Civil Aviation Department 4/F, Air Traffic Control Complex Hong Kong International Airport Hong Kong, China	Tel: +850-2910 6453 Fax: +850-2910 0186 E-mail: jwagstaff@cad.gov.hk
6.	MACAO, CHINA (2)		
	11. Mr. Bryan K.H. Chiu	Technical Officer – Flight Standards Civil Aviation Authority of Macao Alameda Dr. Carlos D’Assumpcao, 336-342 Centro Comercial Cheng Feng, 18 andar Macao, China	Tel: +853 7964142 Fax: +853 2833 8089 E-mail: bryanchiu@aacm.gov.mo
	12. Mr. Hu Gaohong, Hoover	Head of ATC Service Macao Airports Administration Ltd. Macau International Airport Taipa Macao, China	Tel: 853-8982125 Fax: 853-8982130 E-mail: hoover.hu@ada.com.mo
7.	FRANCE/NEW CALEDONIA (1)		
	13. Mr. M. Paquier Ueva	Head Airspace and Procedures Department Department of Civil Aviation B.P. H1 98849 Noumea Cedex New Caledonia	Tel: +687 265 643 Fax: +687 265 206 E-mail: ueva.paquier@aviation-civile.gouv.fr

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
8.	INDIA (2)		
	14. Mr. Vinod K. Yadava	Executive Director (ATM) Airports Authority of India Rajiv Gandhi Bhawan Safdarjung Airport New Delhi 110003 India	Tel: +91 (11) 24631684 Fax: +91 (11) 24611078 E-mail: edatmchqnad@aai.aero
	15. Mr. Jag Mohan Jolly	Jt. GM (Com) Airports Authority of India Rajiv Gandhi Bhawan Safdarjung Airport New Delhi 110003 India	Tel: +91 (11) 24632947 Fax: +91 (11) 24620287 E-mail: jmjolly@aai.aero
9.	INDONESIA (11)		
	16. Mr. Suparno	Directorate of Aviation Electronic and Electricity Facilities DGCA Indonesia Gd. Karya Lt. 23 Jl. Medan Merdeka Barat 8, Jakarta Indonesia	Tel: +62 (21) 350 5006 ext 5152 Fax: +62 (21) 3483 2663 E-mail: parnobekasi@yahoo.com
	17. Mr. Sutono	Chief of Communication Division National Search and Rescue Agency Ministry of Transportation Jl. Medan Merdeka Timur No.5 Jakarta 10110 Indonesia	Tel: +62 (21) 3483 2880, 352 1111 Fax: +62 (21) 3483 2884 E-mail: basarnas@indo.net.id sutonoumar@yahoo.com

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
18.	Mrs. Dinni Noerdiani	Assistant Director for AIS Directorate of Aviation Safety DGCA, Ministry of Transportation Jl. Medan Merdeka Barat 8 Jakarta 10110 Indonesia	Tel: +62 (21) 3507603, 350 7569 Fax: +62 (21) 3507603 E-mail: dinni_n@yahoo.com
19.	Mr. Eri Manjaya	Sub-Directorate of ATS Directorate of Aviation Safety DGCA, Ministry of Transportation Gd. Karya Lt. 23 Jl. Medan Merdeka Barat 8 Jakarta 10110 Indonesia	Tel: +62 (21) 350 6554 Fax: +62 (21) 350 7569
20.	Mr. Harjoso T.	Deputy Director ATS PT. Angkasa Pura I Graha Angkasa Pura Kota Baru Bandar Kemayoran Blok B 12 Kav No. 2 Jakarta Pusat 10610 Indonesia	Tel: +62 (21) 6541961 ext 2310 Mobile: +62 81 127 3950 Fax: +62 (21) 65866838 E-mail: haryo@angkasapura1.co.id rutac52@yahoo.com
21.	Mr. Herman Budiyo	Assistant Manager of ATS Operations PT. Angkasa Pura II Indonesian ATS Provider West Region Kantor Pusat, Bandara Soekarno-Hatta Gedung 600 Lantai 3 ATS Jakarta, Indonesia	Tel: +62 (21) 550 6120 Fax: +62 (21) 550 6106 E-mail: herman.budiyo@angkasapura2.co.id

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
22.	Mr. Bambang Sugeng	Manager of Aeronautical Comm & Information PT. Angkasa Pura II Building 611 Soekarno-Hatta Airport Tangerang, Indonesia	Tel: +62 (21) 5506109 Fax: +62 (21) 5501129 E-mail: ais.bo.jiash@angkasapura2.co.id
23.	Mr. Imron Pramana	Director PT. Elektrindodaya Pakarnusa Aviation Industry of Indonesia Jl. Soekarno Hatta KM 13, 8 Lik Unit C-8 Bandung 40613 Indonesia	Tel: +62 (22) 7801536 Fax: +62 (22) 7801690 E-mail: pramana@nusaweb.com
24.	Mr. Gembong Wibowanto	CNS/ATM Researcher Agency for the Assessment and Application of Technology (BPPT) BPPT Building II, 21st Floor Jl. MH Thamrin 8 Jakarta 10340 Indonesia	Tel: +62 (21) 316 9813 Fax: +62 (21) 316 9811 E-mail: gembong@inn.bppt.go.id
25.	Mr. Husni Fahmi	CNS/ATM Researcher Agency for the Assessment and Application of Technology (BPPT) BPPT Building II, 21st Floor Jl. MH Thamrin 8 Jakarta 10340 Indonesia	Tel: +62 (21) 316 9813 Fax: +62 (21) 316 9811 E-mail: fahmi@inn.bppt.go.id

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
	26. Mr. Irwan Rawal Husdi	Researcher Agency for the Assessment and Application of Technology BPPT Building II, 21st Floor Jl. MH Thamrin 8 Jakarta 10340 Indonesia	Tel: +62 (21) 316 9813 Fax: +62 (21) 316 9811 E-mail: irwan@inn.bppt.go.id
10.	JAPAN (3)		
	27. Mr. Kenjiro Miyazaki	Special Assistant to the Director ATS Planning Division ATS Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki Chiyoda-ku, Tokyo 100-8918 Japan	Tel: +(81) 3-5253 8739 Fax: +(81) 3-5253 1663 E-mail: miyazaki-k2ny@mlit.go.jp
	28. Mr. Satoshi Yamaguchi	Special Assistant to the Director ATC Division Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 2-1-3 Kasumigaseki Chiyoda-ku, Tokyo 100-8918 Japan	Tel: +(81) 3-5253 8749 Fax: +(81) 3-5253 1664 E-mail : yamaguchi-s2i6@mlit.go.jp
	29. Mr. Masanori Kojima	Aeronautical Information Officer AIS Center, Operations and Flight Inspection Div. Air Traffic Services Department Civil Aviation Bureau Ministry of Land, Infrastructure and Transport 133 Komemae Furugome Narita-shi Chiba 282-0004 Japan	Tel: +(81) 476-33-5525 Fax: +(81) 476-33-5527 E-mail : kojima-m41s8@cab.mlit.go.jp

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
11.	MALAYSIA (2)		
	30. Mr. Tan Kim Sin	Assistant Director Aeronautical Information Services Air Traffic Services Division Department of Civil Aviation No.27, Persiaran Perdana Level 4, Podium Block B, Precinct 4 62618 Putrajaya Malaysia	Tel: +60 (3) 8871 4284 Fax: +60 (3) 8881 0530 E-mail: tanks@dca.gov.my tanks_aisatshq@yahoo.com
	31. Mr. Muddatstsir Bin Mashor	Air Traffic Control Officer Department of Civil Aviation Block B, KL ATCC LTSAAS, 47200 Subang, Selangor Malaysia	Tel: +60 (3) 7847 3573, 012-2334540 Fax: +60 (3) 7847 3572 E-mail: mddtstsrmsr@yahoo.com.my
12.	MONGOLIA (3)		
	32. Mr. Purevsukh Purvee	Director of ATM Department Civil Aviation Authority of Mongolia Chinggis Khaan International Airport Buyant-ukhaa, Ulaan Baatar 34 Mongolia	Tel: +976-11-282205 Fax: +976-11-379981 E-mail: purevsukh@mcaa.gov.mn
	33. Mr. Tuvshinbayar Gavaa	Director of AIS of Mongolia Civil Aviation Authority of Mongolia Chinggis Khaan International Airport P.O. Box 59 Buyant-ukhaa, Ulaan Baatar 34 Mongolia	Tel: +976-11-283131, 99115935 Fax: +976-11-283202 E-mail: g_tuvshinbayar@mcaa.gov.mn

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Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
	34. Mr. Bat Gurdorj	Specialist ATS Civil Aviation Authority of Mongolia Buyant-ukhaa, Khan Uul District Ulaan Baatar 210134 Mongolia	Tel: +976-11-282011 Fax: +976-11-379981 E-mail: bat@mcaa.gov.mn
13.	MYANMAR (2)		
	35. U Tike Aung	Regional Air Traffic Control Officer Department of Civil Aviation Yangon International Airport Yangon Myanmar	Tel: +951-663 838 Fax: +951-665 124 E-mail: ats@dca.gov.mm
	36. U Tun Tun Oo	Air Traffic Control Officer Grade II Department of Civil Aviation Yangon International Airport Yangon Myanmar	Tel: +951-663 838 Fax: +951-665 124 E-mail: ats@dca.gov.mm
14.	NEPAL (2)		
	37. Mr. Mohan Adhikari	Director, Air Traffic Services Civil Aviation Authority of Nepal Head Office, Babar Mahal Kathmandu Nepal	Tel: +977-1-4262387 Fax: +977-1-4262516 E-mail: cnsatm@mos.com.np
	38. Mr. Amrika Rai	Senior Officer (AIS) Civil Aviation Authority of Nepal Tribhuvan International Airport Gauchar, Kathmandu Nepal	Tel: +977-1-4490778 Fax: +977-1-4471411 E-mail: cnsatm@mos.com.np

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
15.	NEW ZEALAND (1)		
	39. Mr. Alan G. Roberts	Aeronautical Services – ATS Civil Aviation Authority of New Zealand P.O. Box 31-441 Lower Hutt New Zealand	Tel: +64-4-560 9568 Fax: +64-4-569 2024 E-mail: robertsa@caa.govt.nz
16.	PHILIPPINES (1)		
	40. Mr. Cesar B. Germino	Director I for ATS Air Traffic Service 4/F Air Transportation Office MIA Road, Pasay City 1300 Philippines	Tel: +63 (2) 8799157 Fax: +63 (2) 8799157
17.	REPUBLIC OF KOREA (1)		
	41. Mr. Park Kwang-Soon	Deputy Director of Air Traffic Management Division Civil Aviation Safety Authority 274, Gwahae-Dong, Gangseo-Gu Seoul 157-711 Republic of Korea	Tel: +82-2-2669-6421 Fax: +82-2-6342-7289 E-mail: p.s.park@mact.go.kr
18.	SINGAPORE (3)		
	42. Mr. Kuah Kong Beng	Chief Air Traffic Control Officer Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: +65-6541 2405 Fax: +65-6545 6516 E-mail: kuah_kong_beng@caas.gov.sg

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Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
43.	Mr. Heng Cher Sian Edmund	Project Officer (Air Traffic Management) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: +65-6541 2457 Fax: +65-6545 6516 E-mail: edmund_heng@caas.gov.sg
44.	Mr. Hermizan Mohamed Jumari	Project Officer (Air Traffic Management) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: +65-6541 2464 Fax: +65-6545 6516 E-mail: hermizan_jumari@caas.gov.sg
19.	SRI LANKA (3)		
45.	Mr. Atula Jayawickrama	Deputy Director (Aerodromes & Navigation Svcs) Civil Aviation Authority 64 Galle Road Colombo-3 Sri Lanka	Tel: +94-11-2436324, 94-77-3596210 Fax: +94-11-2440231 E-mail: atulacaa@slt.net.lk
46.	Mr. Kottagoda H. Ratnasiri	Head of Air Navigation Services Airport and Aviation Services (Sri Lanka) Limited Bandaranaike International Airport Colombo, Katunayake Sri Lanka	Tel: +94-11-2252062, 0777-674270 Fax: +94-11-2252062 E-mail: k_rathnasiri@yahoo.com
47.	Mr. R.W.M.F. Rohan Perera	Senior AIS Officer Airport and Aviation Services (Sri Lanka) Limited Bandaranaike International Airport Colombo, Katunayake Sri Lanka	Tel: +94-11-2264201 Fax: +94-11-2259916 E-mail: ais@airport.lk

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	Name	Title/Organization	TEL/FAX/E-MAIL
20.	THAILAND (10)		
	48. Mr. Weerawath Thaitakul	Senior Air Transport Technical Officer Airport Standards and Air Navigation Facilitating Division Department of Civil Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: +66 (2) 286 2909 Fax: +66 (2) 286 2909
	49. Mr. Punlop Sungsilert	Senior Air Transport Technical Officer Flight Standards Bureau Department of Civil Aviation 71 Soi Ngarmduplee, Rama IV Road Bangkok 10120, Thailand	Tel: +66 (2) 285 5450 Fax: +66 (2) 286 2913 E-mail: punlopsung@yahoo.com
	50. Mr. Manas Lomsap	Director, Aeronautical Information Services Centre Aeronautical Radio of Thailand Limited P.O. Box 15-16 Bangkok International Airport Post Office Bangkok 10212, Thailand	Tel: +66 (2) 285 9836 Fax: +66 (2) 285 9848 E-mail : mlomsap@hotmail.com
	51. Mr. Anucha Kammong	Director, Suvarnabhumi Airport Air Traffic Control Centre Aeronautical Radio of Thailand Limited ATC Complex, Suvarnabhumi Airport Bangna-Trad K.M. 15 Rajatheva, Bang-Phli Samutprakarn 10540, Thailand	Tel: +66 (2) 131 3641 Fax: +66 (2) 131 3640 E-mail : kanucha@aerothai.co.th
	52. Mr. Watee Arthakamol	Air Traffic Control Manager Aeronautical Radio of Thailand Limited 102 Ngarmduplee, Tungmahamek Sathorn Bangkok 10120, Thailand	Tel: +66 (2) 285 9532 Fax: +66 (2) 285 9406 E-mail : watee.ar@aerothai.co.th

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
53.	Mr. Suvichan Sthitgitpichead	Air Traffic Control Manager Aeronautical Radio of Thailand Limited 102 Ngarmduplee, Tungmahamek Sathorn Bangkok 10120, Thailand	Tel: +66 (2) 285 9111 Fax: +66 (2) 285 9777 E-mail : suvichan.st@aerothai.co.th
54.	Mr. Tinnagorn Choowong	Air Traffic Control Manager Aeronautical Radio of Thailand Limited 102 Ngarmduplee, Tungmahamek Sathorn Bangkok 10120, Thailand	Tel: +66 (2) 287 8780 Fax: +66 (2) 287 8424 E-mail : tinnagorn.ch@aerothai.co.th
55.	Dr. Paisit Herabat	Engineering Manager Aeronautical Radio of Thailand Limited 102 Ngarmduplee, Tungmahamek Sathorn Bangkok 10120, Thailand	Tel: +66 (2) 285 9191 Fax: +66 (2) 285 9716 E-mail : paisit@aerothai.co.th
56.	Mr. Piyawut Tantimekabut	Systems Engineer, Air Traffic Services Engineering Research and Development Department Aeronautical Radio of Thailand Ltd. 102 Ngamduplee Tungmahamek, Sathorn Bangkok 10120, Thailand	Tel: +66-2-287 8616 Fax: +66-2-287 8620 E-mail: piyawut@aerothai.co.th piyawut@gmail.com
57.	Mr. John Richardson	Air Traffic Management Consultant Aeronautical Radio of Thailand Ltd. 102 Ngamduplee Tungmahamek, Sathorn Bangkok 10120, Thailand	Tel: +66-2-287 8488 Mobile: +66-081-824 2467 Fax: +66-2-285 9488 Email: jrcho282 @gmail.com

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
21.	UNITED STATES (7)		
	58. Mr. David Maynard	Delegation Lead Manager, Oceanic and Offshore Operations US Federal Aviation Administration 800 Independence Ave. S.W. Washington, D.C. 20591 U.S.A.	Tel: +1-202-267 3448 Fax: +1-202-267 5304 E-mail: david.maynard@faa.gov
	59. Ms. Leslie McCormick	International Operations Specialist Air Traffic Control System Command Center US Federal Aviation Administration 13600 EDS Drive, Suite 100 Herndon, VA 20171-3233 U.S.A.	Tel: +1-703-326 3824 Fax: +1-920-273 2882 E-mail: leslie.mccormick@faa.gov
	60. Mr. Gary Bobik	Air Traffic Organization, System Operations Airspace and AIM Division US Federal Aviation Administration 800 Independence Ave. S.W. Washington, D.C. 20591 U.S.A.	Tel: +1-202-493 1407 E-mail: gary.bobik@faa.gov
	61. Mr. Dan Hanlon	Air Traffic Organization Representative, Asia Pacific US Federal Aviation Administration American Embassy Singapore 27 Napier Road Singapore 25808	Tel: +65-6543 1466 E-mail: dan.hanlon@faa.gov

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Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
62.	Mr. Bruce Kinsler	Lead, Air Traffic Control Operational Contingency Planning Air Traffic Control System Command Center US Federal Aviation Administration Herndon, VA 20171 U.S.A.	Tel: +1-703-925 3284 E-mail: bruce.kinsler@faa.gov
63.	Mr. David Edwards	Search and Rescue International/National Engagement ICAO IMO AMVER United States Coast Guard Commandant (CG-3) 2100 2 nd Street SW Washington, D.C. 20593-0001 U.S.A.	Tel: +1-202-372 2087 Fax: +1-202-372 2912 E-mail: David.L.Edwards@uscg.mil
64.	Mr. Ken Fortin	Pacific Air Force Airspace Manager US Department of Defense 25 E St. Suite I-222 Hickam AFB, HI U.S.A.	Tel: +1-808-449-4889 E-mail: kenneth.fortin@hickam.af.mil
22.	VIET NAM (4)		
65.	Mr. Doan Khac Manh	Deputy Director of AND Civil Aviation Administration of Viet Nam 119 Nguyen Son, Long Bien Hanoi The Socialist Republic of Viet Nam	Tel: +84-4-8731 611 Fax: +84-4-8274 194 E-mail: manhdoankhac@caa.gov.vn
66.	Mr. Dao Son Hai	Senior Officer of AND Civil Aviation Administration of Viet Nam 119 Nguyen Son, Long Bien Hanoi The Socialist Republic of Viet Nam	Tel: +84-4-8731 611 Fax: +84-4-8274 194 E-mail: dsh@caa.gov.vn

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Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
	67. Mr. Nguyen Dinh Cong	Manager of AIS Project Civil Aviation Administration of Viet Nam Gialam Airport, Long Bien Dist Hanoi The Socialist Republic of Viet Nam	Tel: +84-4-8726 802 E-mail: vatmats@hn.vnn.vn
	68. Mr. Tran Xuan Son	ATS Specialist Viet Nam Air Traffic Management Civil Aviation Administration of Viet Nam Gialam Airport, Long Bien Dist Hanoi The Socialist Republic of Viet Nam	Tel: +84-4-8725271 Fax: +84-4-8725281 E-mail: stats8668@yahoo.com
23.	IATA (2)		
	69. Mr. Shixin Cheng	Manager Safety, Operations & Infrastructure, North Asia International Air Transport Association 12F, No. 12 Building, Xibahebeili Chaoyang District Beijing People's Republic of China	Tel: +86 (10) 8425 2591 Fax: +86 (10) 6429 8684 E-mail: chengsx@iata.org
	70. Mr. Owen Dell	Manager, International Operations Cathay Pacific Airways Limited International Affairs Department 9/F, Central Tower, Cathay Pacific City 8 Scenic Road Hong Kong International Airport Lantau Island Hong Kong, China	Tel: +852-2747 8829 Fax: +852-2141 8829 E-mail: Owen_dell@cathaypacific.com

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
24.	IFALPA (1)		
	71. Capt. Korn Mansumitchai	Regional Vice President for Asia/East IFALPA 484 Rachadanivet Soi 12 Samsennok, Huaykwhang Bangkok 10320 Thailand	Tel: +081-3446055 Fax: +02-5130030 E-mail: captainkorn@gmail.com
25.	ICAO (5)		
	72. Capt. Dave VanNess	Implementation & Resource Development Coordinator Performance Based Navigation Programme Flight Safety Section (FLS) International Civil Aviation Organization 999 University Street Montreal, Quebec Canada H3C 5H7	Tel: +1 514 954 8219 ext 7370 Cell: +1 678 206 9277 Fax: +1 514 954 6759 E-mail: dvanness@icao.int
	73. Mr. Andrew Tiede	Regional Officer, Air Traffic Management ICAO Asia & Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900, Thailand	Tel: +66-2-5378189 ext 152 Fax: +66-2-5378199 E-mail: atiede@bangkok.icao.int
	74. Mr. Kyotaro Harano	Regional Officer, Air Traffic Management ICAO Asia & Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900, Thailand	Tel: +66-2-5378189 ext 159 Fax: +66-2-5378199 E-mail: kharano@bangkok.icao.int

ATM/AIS/SAR/SG/17
Attachment 1 to the Report

	Name	Title/Organization	TEL/FAX/E-MAIL
75.	Mr. Polawat Chootai	Regional Officer, Air Traffic Management ICAO Asia & Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900, Thailand	Tel: +66-2-5378189 ext 151 Fax: +66-2-5378199 E-mail: pchootai@bangkok.icao.int
76.	Mr. David Moores	ATM Expert ICAO Asia & Pacific Office 252/1 Vibhavadi Rangsit Rd Ladyao, Chatuchak Bangkok 10900, Thailand	Tel: +66-2-5378189 ext 154 Mobile: +61(0) 4-24900988 E-mail: dmoores1@yahoo.com

LIST OF WORKING AND INFORMATION PAPERS

WORKING PAPERS

WP/No.	Agenda Item	Subject	Presented by
1	1	Provisional Agenda	Secretariat
2	2	APANPIRG/17 Report and ANC/Council Actions	Secretariat
3	3	Traffic Sample Data (TSD) State Letter	Secretariat
4	3	Implementation of Conditional Routes (CDRs)	Secretariat
5	3	Implementation of ATFM in Bay of Bengal and South Asia	Secretariat
6	3	Finalization of the Contingency Plan for Indonesia	Secretariat
7	3	State Focal Point for Safety Related Activities	Secretariat
8	4	Review of AIS Implementation Task Force (AITF/2)	Secretariat
9	4	States Adherence to AIRAC	Australia
10	4	Outcomes of the Inaugural Asia Pacific Air Navigation Service Provider Conference	Australia
11	4	Instructions for the Completion of the NOTAM Format	New Zealand
12	5	Summary Reports of the FANS Implementation Team Bay of Bengal (FIT-BOB)	Secretariat
13	5	Summary Reports of the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG)	Secretariat
14	5	Summary of the First Meeting of the Trans-Regional Airspace and Supporting ATM Systems Steering Group (TRASAS/1)	Secretariat
15	6	Report on Activities of the RASMAG	Secretariat
16	6	Funding of Regional Airspace Safety Monitoring & Outcomes of the Regional Airspace Safety Monitoring Committees Task Force	Secretariat
17	6	Asia/Pacific RVSM Safety Assessments	Secretariat
18	3	Improving SAR Services within the Asia-Pacific Region	United States
19	10	Civil/Military Air Traffic Management Summit (CMAC'07)	United States
20	3	Air Traffic Flow Management – A Concept	United States
21	5	Variations in True Airspeed	United States on behalf of ISPACG & IPACG

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WP/No.	Agenda Item	Subject	Presented by
22	7	Oakland ARTCC ATS Route Realignment	United States
23	7	Use of 30NM Lateral/30NM Longitudinal Separation (30/30)	United States
24	7	Overview of the NAS Aeronautical Information Management Digital NOTAM Program	United States
25	3	Outcome of the Comprehensive Survey in Aeronautical Information Service	Secretariat
26	3	Implementation of RVSM in the Asia Pacific Region	Secretariat
27	5	Summary Reports of the FANS Implementation Team Southeast Asia (FIT-SEA)	Secretariat
28	3	The ATS Interfacility Data Communication Review Task Force Meeting (AIDC/TF)	Secretariat
29	3	Implementation of Electronic Terrain and Obstacle Data (eTod) in Hong Kong, China	Hong Kong, China
30	4	ICAO Language Proficiency Provisions – Progress Report	Secretariat
31	4	Unmanned Aircraft Systems	Secretariat
32	7	Sixth Meeting of Automatic Dependent Surveillance-Broadcast (ADS-B) Study and Implementation Task Force	Secretariat
33	3	Search and Rescue Matters	Secretariat
34	5	Summary Report of the Eighteenth Meeting of the Bay of Bengal ATS Coordination Meeting (BBACG/18)	Secretariat
35	7	Update on the Development of the ICAO EUR/NAT Regional Database for the Five-Letter Name-codes Allocations	Secretariat
36	3	Draft for the Amendment to Chapter 3 of the <i>Guidance Manual for Aeronautical Information Services (AIS) in the Asia/Pacific Region</i>	Japan
37	2	Review and Update Conclusions and Decisions of APANPIRG	Secretariat
38	3	ICAO Special Implementation Project – SAR Workshop	Secretariat
39	3	APANPIRG/17 Review of ALLPIRG/5	Secretariat
40	4	Review of the Asia and Pacific ATS Route Catalogue	Secretariat
41	9	ATM/AIS/SAR Task List	Secretariat
42	4	Traffic Movements and GNE Reports July 2006 to May 2007 on the Four Designated Monitored Areas in the South China Sea	Singapore

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43	5	Review of the Report of the Fourteenth Meeting of the South-East Asia ATS Co-ordination Group (SEACG/14)	Secretariat
44	3	ATFM in Bay of Bengal and South Asia	IATA
45	4	Implementation of Routes from the Asia and Pacific ATS Route Catalogue	IATA
46	4	Ongoing Communications Difficulties in Yangon FIR	IATA
47	4	IATA Request for RNP-SEA/TF Meeting	IATA
48	8	List of Air Navigation Deficiencies in the ATM/AIS/SAR Fields	Secretariat
49	4	Review of the Recommendation of the 43 rd Conference of Directors General of Civil Aviation Asia and Pacific Regions	Secretariat
50	10	Update on the ICAO Global Air Navigation Plan and ICAO's Strategic Objectives	Secretariat
51	7	Regional Survey of the Requirements for Meteorological Information in support of ATM	Secretariat on behalf of MET/ATM/TF Rapporteur
52	3	Air Traffic Flow Management for Aircraft entering the Kabul FIR	Thailand
53	7	Implementation of Performance Based Navigation (PBN)	Secretariat

INFORMATION PAPERS

IP/No.	Agenda Item	Subject	Presented by
1	–	List of Tentative Working and Information Papers	Secretariat
2	7	Report on the Business Case Development for ADS-C In-trial Procedures	United States
3	10	Automating Operational Contingency Planning	United States
4	10	North American Sustainment of Aviation Operations during a Pandemic Influenza Outbreak – A concept of Operations and Agreement	United States
5	3	Caribbean/South American Air Traffic Flow Management Concept of Operation	United States
6	5	Update on the Work of the Informal South Pacific ATS Coordinating Group (ISPACG)	United States New Zealand
7	5	IPACG/FIT Meetings Summary	United States
8	4	Implementation of Safety Management System (SMS) for Air Traffic Services (ATS) in Japan	Japan
9	4	Implementation of ICAO Language Proficiency Requirements on Air Traffic Controllers and Aeronautical Station Operators in Japan	Japan
10	4	Establishment of the AIS Center in Japan	Japan
11	10	Report of Second Inter-Regional Coordination Meeting	Secretariat
12	10	Airbus A380 Wake Vortex – Revised Guidance Material	Secretariat
13	10	ICAO Website of the Flight Safety Information Exchange	Secretariat
14	5	Review of the Report of Fifth Special ATS Co-ordination Meeting – China, Mongolia, The Russian Federation and IATA (CMRI/5)	Secretariat
15	8	Special Implementation Project to assist States in the Rectification of Air Navigation Deficiencies	Secretariat
16	7	Proposed Amendments to the ICAO Flight Plan	Secretariat
17	10	Update of the Universal Safety Oversight Audit Programme (USOAP)	Secretariat
18	4	Implementation of RNAV5 and RNAV1 in Japan	Japan
19	4	Report of the First Meeting of the Seamless Airspace Working Group	Thailand

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