



*International Civil Aviation Organization*

**NINETEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION  
AND SURVEILLANCE SUB-GROUP (CNS SG/19) OF APANPIRG**

Bangkok, Thailand, 20 – 24 July 2015

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**Agenda Item 8.2: Review outcome of e-ANP WG meeting and regional air navigation tables**

**OUTCOME OF EANP WORKING GROUP ON e-ANP**

(Presented by the Secretariat)

**SUMMARY**

This paper presents the outcome of the of the EANP Working Group established by the CNS SG/18 meeting and follow up action taken by the Secretariat and relevant meetings. The proposed draft materials (revised wording for e-ANP Vol. 1) and proposed draft tables (7 of them) for e-ANP Vol. II are provided in Attachment to this paper for consideration by the meeting. The meeting is expected to provide further updates if any and make recommendation for adoption by APANPIRG/26 for circulation to States/Administrations in accordance with the established procedure.

**1. INTRODUCTION**

1.1 In accordance with Decision 18/23 of CNS Sub-group of APANPIRG regarding the establishment of a small working group to develop CNS part of future e-ANP, the working group meeting was held at ICAO APAC Regional Office, Bangkok, Thailand from 8 to 10 April 2015. Prior to this meeting, two teleconferences on the same subject were organized early 2015.

1.2 The meeting was attended by 12 participants from Cambodia, China, India, Japan, Malaysia, Papua New Guinea, Singapore, Thailand and USA.

1.3 The report of the meeting and working document are available at the following webpage:  
<http://www.icao.int/APAC/Meetings/Pages/2015-eANP-WG.aspx>

1.4 The meeting may wish to recall that development and maintenance of the CNS parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) is one of the important tasks listed in the current and proposed new TOR of CNS SG.

## 2. DISCUSSION

### Text Elements of e-ANP in the CNS Part

2.1 Based on contributions from lead of members for each part of the e-ANP and as a result of discussions, the meeting agreed to keep some regional specific requirement in the text part of e-ANP Vol. I one and Vol. II. The meeting reviewed the proposal initially presented by Thailand and made recommendations for keeping some important contents separately in the different volumes of the new e-ANP. Some out of dated APANPIRG Conclusions were suggested to be no longer kept in the e-ANP. The meeting also reviewed the proposed text part of e-ANP Vol. III. The final draft text part for e-ANP Vol. I, Vol. II and Vol. III is provided in the **Appendices A, B and C** to this paper for review by this meeting.

### e-ANP Vol. II - common template parts

2.2 The meeting reviewed four new templates for the CNS part adopted by the Council. The meeting reviewed populated **TABLE CNS II-1 - AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN** initially input by India based on the latest available information. The table was further updated by ACSICG/2 meeting held in May 2015. The Table CNS II-1 agreed by the meeting is provided in **Appendix D1** to this paper for consideration by this meeting.

2.3 The meeting also reviewed the **TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN** presented by China. The table was also further updated by ACSICG/2 meeting. The final draft Table CNS II-2 is provided in the **Appendix D2** to this paper for consideration by the meeting.

2.4 Singapore presented the initial input for new **Table CNS II-3- ATS Direct Speech Circuits Plan (Appendix D3)** based on existing information and required format. Considering the current table had not been updated since 2006. The Secretariat was requested to issue a State Letter to States/Administrations for comments.

2.5 The meeting noted that new table containing the requirement for the HF Network designators applicable for the Region is defined as **TABLE CNS II-4 - HF NETWORK DESIGNATORS**. The Secretariat was requested to complete this task and provide the result for consideration by this meeting. The updated information based available information in ANP and other document is provided in **Appendix D4** to this paper for consideration by this meeting.

### e-ANP Vol. II - Regional Specific Requirements

2.6 The meeting further reviewed the rest of CNS Tables in the Part IV of FASID (Doc 9673 Vol. II). The following tables were considered to be kept and updated or merged:

- Table CNS 1E - AIDC Implementation Plan (Aug.2012 updated);
- Table CNS 3 - Radio Navigation Aids (2006 updated);
- Table CNS 4A - Surveillance System (Aug. 2010 updated); and
- Table CNS 4B - ATS Automation System (Aug. 2010 updated)

2.7 The meeting considered the Table CNS 1C – AMHS Routing Plan which had not been included in the harmonized templates approved by the Council. The meeting did not recommend to keep this Table in the e-ANP. ACSICG/2 meeting held on 20-22 May 2015 also agreed to drop this planning table in order to harmonize with other regions.

2.8 The meeting considered that the information contained in the current Table CNS 1E – AIDC Implementation Plan should be kept as regional specific requirements as implementation of AIDC had been identified as one of priorities by APANPIRG. The APAC AIDC Task Force (APA TF/1) meeting held on 16-18 June 2015 also agreed to keep this planning table and updated the information in the Table. The updated draft **Table CNS II-5 - AIDC Implementation Plan** is provided in **Appendix D5** to this paper.

2.9 The meeting also discussed the need for the Table CNS 2 - AMS and AMSS and considered that the information contained in this Table would be only useful for radio frequency coordination. The meeting did not recommend keeping this Table in the new e-ANP Vol. II as regional specific requirement. However, some information was exacted for development of Table CNS II-4.

2.10 The meeting reviewed information contained in the Table CNS 3 - Radio Navigation Aids considered that information relating requirement for ILS, VOR and DME may still be useful for systematic planning and charges calculation. The meeting recommended keeping such information as regional specific requirement. However, it was recommended to simplify the table by removing that information of NDB and GNSS. The latter was considered as part of the regional PBN plan. Singapore presented a simplified format for this Table with additional columns for implementation status. The Secretariat was requested to circulate the populated table provided Singapore to States/Administrations for further updates. The updated Table is provided in **Appendix D6** to this paper for review by this meeting.

2.11 The meeting further reviewed information contained in Table CNS 4A - Surveillance System and Table CNS 4B - ATS Automation System. The meeting agreed to keep the essential information from these two tables and merging into one consolidated table as regional specific requirement. In this connection, the meeting discussed the initial sample combination presented by Thailand. Secretariat was requested to circulate the populated table provided Singapore to States/Administrations for further updates. The updated Table is provided in **Appendix D7** to this paper for consideration by this meeting. The revised format for Surveillance System Table

2.12 To follow the request from eANP working group, ICAO Regional Office issued a State Letter (T 8/2.10 & T 8/10.21:AP069/15 (CNS) dated 29<sup>th</sup> April 2015) asking States/Administrations to verify the relevant information based on the operational requirements for following Tables:

- Table CNS II-3 - ATS Direct Speech Circuits Plan
- Table CNS II-5 - Radio Navigation Aids
- Table CNS II-6 – Surveillance

2.12.1 The feedback from States/Administration on above Tables have been reflected in the draft e-ANP tables.

**3. ACTION BY THE MEETING**

- 3.1 The meeting is invited to note the information contained in this paper;
- 3.2 Further update the information contained in these draft tables when necessary; and
- 3.3 Consider to following Draft Conclusions:

**Draft Conclusion 19/xx - CNS parts for e-ANP**

That, the text elements contained in Appendices A, B, C and CNS Tables provided in Appendices D1, D2, D3, D4, D5, D6 and D7 for CNS Parts of eANP be adopted and distributed to States/Administrations through PFA in accordance with the established procedure.

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## SPACE > ANP > PART III - CNS

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### ASIA/PAC ANP, VOLUME I

### PART III – COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS)

#### 1. INTRODUCTION

1.1 This part of the APAC ANP constitutes the agreed regional requirements considered to be the minimum necessary for effective planning and implementation of Communications, Navigation and Surveillance (CNS) facilities and services in the Asia and Pacific Regions and complements the provisions of ICAO SARPs and PANS related to CNS. It contains stable plan elements related to the assignment of responsibilities to States for the provision of CNS facilities and services within the ICAO Asia and Pacific Regions in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300) and mandatory requirements related to the CNS facilities and services to be implemented by States in accordance with regional air navigation agreements.

1.2 The dynamic plan elements related to the assignment of responsibilities to States for the provision of CNS facilities and services and the mandatory requirements based on regional air navigation agreements related to CNS are contained in the APAC ANP Volume II, Part III – CNS.

1.3 The APAC ANP Volume III contains dynamic/flexible plan elements related to the implementation of air navigation systems and their modernization in line with the ICAO Aviation System Block Upgrades (ASBUs) methodology and associated technology roadmaps described in the Global Air Navigation Plan. The Aviation System Block Upgrades (ASBU) modules are aimed at increasing capacity and improving efficiency of the aviation system whilst maintaining or enhancing safety level, and achieving the necessary harmonization and interoperability at regional and global level. This includes the regionally agreed ASBU

modules applicable to the specified ICAO region/sub-region and associated elements/enablers necessary for the monitoring of the status of implementation of these ASBU modules.

1.4 In planning for these elements, economy and efficiency should be taken into account in order to ensure that the requirements for the provision of CNS facilities and services can be kept to a minimum. CNS facilities and services should fulfil multiple functions whenever this is feasible.

### ***Standards, Recommended Practices and Procedures***

1.5 The Standards, Recommended Practices and Procedures (SARPs) and related guidance material applicable to the provision of CNS are contained in:

- a) Annex 10 – *Aeronautical Telecommunications*, Volumes I, II, III, IV and V;
- b) Annex 2 – *Rules of the Air*
- c) Annex 3 – *Meteorological Service for international air navigation*;
- d) Annex 6 – *Operation of Aircraft*, Parts I (Chapter 7), II (Chapter 7) and III (Chapter 5);
- e) Annex 11 – *Air Traffic Services*;
- f) Annex 12 – *Search and Rescue*;
- g) Annex 15 – *Aeronautical Information Services*;
- h) *Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM)* (Doc 4444);
- i) *Regional Supplementary Procedures* (Doc 7030);
- j) *GNSS Manual* (Doc 9849);
- k) *Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols* (Doc 9880);
- l) *ICAO Aeronautical Telecommunication Network (ATN) Manual for the ATN using IPS Standards and Protocols* (Doc 9896);
- m) *Manual of Testing of Radio Navigation Aids* (Doc 8071);
- n) *Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunications Network* (Doc 8259);
- o) *Manual on Required Communication Performance (RCP)* (Doc 9869);
- p) *Training Manual* (Doc 7192);
- q) *Performance-based Navigation Manual* (Doc 9613);
- r) *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718);
- s) *ICAO Manual on the Secondary Surveillance Radar (SSR) Systems* (Doc 9684);
- t) *Manual on Airborne Surveillance Applications* (Doc 9994); and
- u) *Manual of Air Traffic Services Data Link Applications* (Doc 9694).

## **2. GENERAL REGIONAL REQUIREMENTS**

### **Communications**

#### *Aeronautical Fixed Service (AFS)*

2.1 The aeronautical fixed service (AFS) should satisfy the communication requirements of ATS, AIS/AIM, MET and SAR, including specific requirements in terms of system reliability, message integrity and

transit times, with respect to printed as well as digital data and speech communications. If need be, it should, following agreement between individual States and aircraft operators, satisfy the requirements for airline operational control.

#### *The Aeronautical Telecommunication Network (ATN)*

2.2 The ATN of the Region(s) should have sufficient capacity to meet the minimum requirements for data communications for the services mentioned in paragraph 2.1 above.

#### *Aeronautical Mobile Service (AMS)*

2.3 Air-ground communications facilities should meet the agreed communication requirements of the air traffic services, as well as all other types of communications which are acceptable on the AMS to the extent that the latter types of communications can be accommodated.

#### *Air-ground communications for ATS*

2.4 Air-ground communications for ATS purposes should be so designed to require the least number of frequency and channel changes for aircraft in flight compatible with the provision of the required service. They should also provide for the minimum amount of coordination between ATS units and provide for optimum economy in the frequency spectrum used for this purpose.

#### *Air-ground data link communications*

2.5 Air-ground data link communications should be implemented in such a way that they are regionally and globally harmonised and make efficient use of available communication means and ensure optimum economy in frequency spectrum use and system automation.

### **Navigation**

2.6 Planning of aeronautical radio navigation services should be done on a total system basis, taking full account of the navigation capabilities as well as cost effectiveness. The total system composed of station-referenced navigation aids, satellite-based navigation systems and airborne capabilities should meet the performance based navigation (PBN) requirements for all aircraft using the system and should form an adequate basis for the provision of positioning, guidance and air traffic services.

2.7 Account should be taken of the fact that certain aircraft may be able to meet their navigation needs by means of self-contained or satellite-based aids, thus eliminating the need for the provision of station-referenced aids along the ATS routes used by such aircraft, as well as the need to carry on board excessive redundancies.

### **Surveillance**

2.8 Planning of aeronautical surveillance systems should be made based on a system approach concept, where collaboration and sharing of data sources should be considered in support of an efficient use of the airspace.

## Frequency Management

2.9 Frequency assignment planning in the Region(s) should be carried out in accordance with the provisions of Annex 10 and *ICAO Handbook on Radio Frequency spectrum for Civil Aviation* (Doc 9718), supplemented, as necessary, by regional recommendations and technical criteria developed for this purpose.

### 3. SPECIFIC REGIONAL REQUIREMENTS

#### Communications

##### AFTN

3.1 The AFTN inter-regional entry/exit points:

- a) between ASIA/PAC and AFI should be Brisbane and Mumbai;
- b) between ASIA/PAC and EUR should be Bangkok, Singapore and Tokyo;
- c) between ASIA/PAC and MID should be Karachi, Mumbai and Singapore;
- d) between ASIA/PAC and NAM should be Brisbane, Nadi and Tokyo; and
- e) between ASIA/PAC and CAR/SAM should be Brisbane.

[APANPIRG/11, Conc. 11/6]

3.2 The trunk circuits interconnecting main AFTN communication centres should be provided to operate at a modulation rate commensurate with operational requirements, and employ International Alphabet Number 5 (IA-5) and character-oriented data link control procedures — system category B, or bit-oriented data link control procedures as defined in Annex 10, Volume III, Part I, Chapter 8.

3.3 The circuits connecting tributary AFTN communication centres with main AFTN communication



centres, or with other tributary AFTN communication centres, or with AFTN stations should be provided with, a modulation rate commensurate with operational requirements employing IA-5 code and procedures and an appropriately controlled circuit protocol.

[ASIA/PAC AFS RPG/3, Rec. 3/1]

#### *ATN/AMHS implementation*

3.4 Considering the inclusion of ATN over IPS SARPs in ICAO Annex 10, Volume 3 and to support global harmonization of ATN implementation, States hosting BBIS should implement ATN over IPS in addition to ATN over OSI and complete this implementation of Dual Stack ATN (ATN/OSI and ATN/IPS) by 2011.

[APANPIRG 19/20]

3.5 States should permit non-backbone States, and States in other regions with connections to Asia/Pacific region, to connect their Message Transfer Agents (MTAs) to backbone States using either the OSI-based ATN Internet Communications Services (ICS) or the ATN IPS on a bilateral basis.

[APANPIRG 21/20]

#### *HF en-route communications*

3.6 States should be urged to coordinate on a national basis with the appropriate national regulators, a programme directed towards achieving the elimination of the interference currently being experienced on some of the frequencies allocated to the Aeronautical Mobile (R) Service in the ASIA/PAC regions. When reviewing methods for developing such a national programme, consideration should be given to the procedures in Article S15 of the ITU Radio Regulations.

#### *Frequency management*

3.7 States in the ASIA/PAC regions should coordinate, as necessary, with the ICAO Regional Office all radio frequency assignments for both national and inter-national facilities in the 190–526.50 kHz, 108–117.975 MHz, 960–1215 MHz and 117.975–137 MHz bands.

[ASIA/PAC/3, Conc. 11/4, 11/5 and 12/9]

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### *GNSS minimum requirement for RNP*

3.8 State aviation authorities, in partnership with other agencies of the State are requested to prohibit malicious and unintentional interference to GNSS and regulate legitimate uses of technology to preserve aviation utility of GNSS.

[APANPIRG/22, Conc.22/28]

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[APANPIRG/11, Conc. 11/6]

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[ASIA/PAC AFS RPG/3, Rec. 3/1]

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[APANPIRG 19/20]

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[APANPIRG 21/20]

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[ASIA/PAC/3, Conc. 11/4, 11/5 and 12/9]

## Navigation

### *GNSS minimum requirement for RNP*

3.8 State aviation authorities, in partnership with other agencies of the State are requested to prohibit malicious and unintentional interference to GNSS and regulate legitimate uses of technology to preserve aviation utility of GNSS.

[APANPIRG/22, Conc.22/28]

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SPACE > ANP > PART III - CNS

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## ASIA/PAC ANP, VOLUME II

### PART III – COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS)

#### 1. INTRODUCTION

1.1 This part of the APAC ANP, Volume II, complements the provisions in ICAO SARPs and PANS related to communication, navigation and surveillance (CNS). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of CNS facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to CNS facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

#### 2. GENERAL REGIONAL REQUIREMENTS

##### Communications

###### *Aeronautical Fixed Service (AFS)*

2.1 The aeronautical fixed service should comprise the following systems and applications that are used for ground-ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:

- a) ATS direct speech circuits and networks;
- b) meteorological operational circuits, networks and broadcast systems, including World Area Forecast System – Internet File Service (WIFS) and/or Satellite Distribution System for Information Relating to Air Navigation (SADIS);
- c) the aeronautical fixed telecommunications network (AFTN);
- d) the common ICAO data interchange network (CIDIN);
- e) the air traffic services (ATS) message handling services (AMHS); and
- f) the inter-centre communications (ICC).

2.2 To meet the data communication requirements, a uniform high-grade aeronautical network should be provided, based on the aeronautical telecommunication network (ATN), taking into account the existence and continuation of current networks.

2.3 Contingency procedures should be in place to ensure that, in case of a communication centre breakdown, all the parties concerned are promptly informed of the prevailing situation. All possible arrangements should be made to ensure that, in case of breakdown of a communications centre or circuit, at least high-priority traffic continues to be handled by appropriate means.

2.4 AFS planning should permit flexibility in detailed development and implementation. The required AFTN Stations and Centres are listed in the AFTN Plan in **Table CNS II-1**.

###### *The Aeronautical Telecommunication Network (ATN)*

2.5 The ATN should be able to:

- a) support applications carried by the existing networks;
- b) support gateways enabling inter-operation with existing networks; and

c) support ground-ground communications traffic associated with air-ground data link applications.

2.6 The ATN should make optimum use of dedicated bilateral/multilateral aeronautical links and other communication means commensurate with the operational Quality of Service (QoS) requirements.

2.7 The implementation of the ATN should take into account the need for cost-effective evolution in terms of network capacity, requirements and time-frame and allow for a progressive transition from existing communication networks and services to a uniform, harmonised and integrated communications infrastructure, capable of supporting the implementation of future aeronautical services such as Flight and Flow Information in a Collaborative Environment (F-FICE), System-Wide Information Management (SWIM) applications, etc.

2.8 In case means other than dedicated bilateral links are used by the ATN, States should ensure that service level agreements (SLA) are met in terms of implementation priority, high availability, priority in restoration of service and appropriate levels of security.

2.9 The ATN should provide for interregional connections to support data exchange and mobile routing within the global ATN.

2.10 In planning the ATN, provisions should be made, where required, for interfacing with other international networks. The Required ATN Infrastructure Routing Plan is described under **Table CNS II-2**.

#### *Network services*

2.11 The Internet Society (ISOC) communications standards for the Internet Protocol Suite (IPS) should be used for the implementation of AMHS.

2.12 The migration from legacy bit-oriented protocols such as X.25 Protocol suite to IPS should be planned.

2.13 The migration of international or sub-regional ground networks to the ATN based on Internet Protocol (IP) to support AFS communication requirements, while reducing costs, should be planned.

2.14 States should ensure that the solutions provided for the implementation of the ATN meet the air traffic management and aeronautical fixed service requirements. Such requirements should consist of:

- a) Performance requirements: availability, continuity, integrity, monitoring and alerting criteria per data flow. In the case where a required communication performance (RCP) is globally prescribed, requirements derived from RCP should be stated;
- b) Interoperability requirements;
- c) Safety and security requirements, duly derived after the identification of operational hazards and threats, and allocation of objectives; and
- d) Implementation process requirements (creation, test, migration, upgrades, priority in restoration of service, termination).

#### *Network management*

2.15 An ICAO centralised off-line network management service is provided to participating AFTN/ AMHS centres in the Asia and Pacific Regions under the ATS Messaging Centre (AMC).

2.16 In the case of integrated communications services procured and shared by several States, organizational provisions should allow for the planning and performing of the management of technical performance, network configuration, fault, security, cost division/allocation, contract, orders and payment.

#### *Specific air traffic management (ATM) requirements*

2.17 Where ATS speech and data communication links between any two points are provided, the engineering arrangements should be such as to avoid the simultaneous loss of both circuits. The required ATS direct speech circuits plan is detailed under **Table CNS II-3**.

2.18 Special provisions should be made to ensure a rapid restoration of ATS speech circuits in case of outage, as derived from the performance and safety requirements.

2.19 Data circuits between ATS systems should provide for both high capacity and message integrity.

2.20 The Inter-Centre Communication (ICC), consisting of ATS Inter-facility Data Communication (AIDC) application and the Online Data Interchange (OLDI) application, should be used for automated exchange of flight data between ATS units to enhance the overall safety of the ATM operation and increase airspace capacity.

2.21 Where Voice over IP is planned or implemented between ATS units for voice communications, it should meet the ATS requirements. When data and voice are multiplexed, particular attention should be paid to the achievement of the ATM performance and safety requirements.

*Specific meteorological (MET) requirements*

2.22 The increasing use of the GRIB (Gridded Binary or General Regularly-distributed Information in Binary form) and BUFR (Binary Universal Form for the Representation of meteorological data) code forms for the dissemination of the upper wind and temperature and significant weather forecasts and the planned transition to digital form using extensible markup language (XML)/geography markup language (GML) for the dissemination of OPMET data should be taken into account in the planning process of the ATN.

2.23 In planning the ATN, account should be taken of changes in the current pattern of distribution of meteorological information resulting from the increasing number of long-range direct flights and the trend towards centralized flight planning.

*Specific aeronautical information management (AIM) requirements*

2.24 The aeronautical fixed service should meet the requirements to support efficient provision of aeronautical information services through appropriate connections to area control centres (ACCs), flight information centres (FICs), aerodromes and heliports at which an information service is established.

*Aeronautical Mobile Service (AMS)*

2.25 To meet the air-ground data communication requirements, a high-grade aeronautical network should be provided based on the ATN, recognising that other technologies may be used as part of the transition. The network needs to integrate the various data links in a seamless fashion and provide for end-to-end communications between airborne and ground-based facilities.

2.26 Whenever required, use of suitable techniques on VHF or higher frequencies should be made. The required HF network designators applicable for the Asia and Pacific Regions are listed in **Table CNS II-4**.

2.27 Aerodromes having a significant volume of International General Aviation (IGA) traffic should also be provided with appropriate air-ground communication channels.

*Air-Ground Data Link Communications*

2.28 A Strategy for the harmonised implementation of the data link communications in the Asia and Pacific Regions should be developed based on the Global Operational Data Link Document (GOLD) adopted by ICAO Regions and the Aviation System Block Upgrade (ASBU) methodology.

2.29 Where applicable, controller-pilot data link communications (CPDLC), based on ATN VDL data link Mode 2 (VDL2) and/or FANS-1/A, should be implemented for air-ground data link communications.

2.30 Partial or divergent aircraft data link evolutions that result in excluding messages from aircraft systems should not be pursued. Interim steps or phases toward full implementation of the common technical definition in ground systems should only be pursued on a regional basis, after coordination between all States concerned.

2.31 Harmonization of operational procedures for implementation of the above packages is essential. States, Planning and Implementation Regional Groups (PIRGs) and air navigation services providers should adopt common procedures to support seamless ATS provision across FIR boundaries, rather than each State or Region developing and promulgating unique procedures for common functions.

*Required Communication Performance (RCP)*

2.32 The Required Communication Performance (RCP) concept characterizing the performance required for communication capabilities that support ATM functions without reference to any specific technology should be applied wherever possible.

2.33 States should determine, prescribe and monitor the implementation of the RCP in line with the provisions laid down in the *ICAO Manual on Required Communication Performance (Doc 9869)*.

**Navigation***Navigation Infrastructure*

2.34 The navigation infrastructure should meet the requirements for all phases of flight from take-off to final approach and landing.

*Note: Annex 10 to the Convention on International Civil Aviation—Aeronautical Telecommunications, Volume I — Radio Navigation Aids, Attachment B, provides the strategy for introduction and application of non-visual aids to approach and landing.*

2.35 The PBN-related items in the APAC Seamless ATM Plan provides guidance to air navigation service providers, airspace operators and users, regulators, and international organizations, on the expected evolution of the regional air navigation system in order to allow planning of airspace changes,

enabling ATM systems and aircraft equipage. It takes due account of the operational environment of the Asia and Pacific Regions.

#### *PBN Transition Strategy*

2.36 During transition to performance-based navigation (PBN), sufficient ground infrastructure for conventional navigation systems should remain available. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip appropriately to attain a performance level equivalent to PBN. States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised. This should be guaranteed by conducting safety assessments and consultations with the users.

#### *Use of specific navigation aids*

2.37 Where, within a given airspace, specific groups of users have been authorized by the competent authorities to use special aids for navigation. The respective ground facilities should be located and aligned so as to provide for full compatibility of navigational guidance with that derived from the SARPs.

2.38 States should ensure and oversee that service providers take appropriate corrective measures promptly whenever required by a significant degradation in the accuracy of navigation aids (either space based or ground based or both) is detected.

#### **Surveillance**

2.40 An important element of modern air navigation infrastructure required to manage safely increasing levels and complexity of air traffic is aeronautical surveillance systems.

2.41 When operating Mode S radars, States should coordinate with their corresponding Regional ICAO Office the assignment of their corresponding interrogator identifier (II) codes and surveillance identifier (SI) codes, particularly where areas of overlapping coverage will occur.

#### **Frequency Management**

##### *Aeronautical Mobile Service (AMS)*

2.42 Frequencies should be assigned to all VHF aeronautical mobile service (AMS) facilities in accordance with the principles laid out in Annex 10, Volume V and *ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718) Volumes I and II, and take into account:

- a) agreed geographical separation criteria based on 25 kHz or 8.33 kHz interleaving between channels;
- b) agreed geographical separation criteria for the implementation of VDL services;
- c) the need for maximum economy in frequency demands and in radio spectrum utilization; and
- d) a deployment of frequencies which ensures that international services are planned to be free of interference from other services using the same band.

2.43 The priority order to be followed in the assignment of frequencies to service is:

- a) ATS channels serving international services (ACC, APP, TWR, FIS);
- b) ATS channels serving national purposes;
- c) channels serving international VOLMET services;
- d) channels serving ATIS and PAR; and
- e) channels used for other than ATS purposes.

2.44 The criteria used for frequency assignment planning for VHF AMS facilities serving international requirements should, to the extent practicable, also be used to satisfy the need for national VHF AMS facilities.

2.45 Special provisions should be made, by agreement between the States concerned, for the sharing and the application of reduced protection of non-ATS frequencies in the national sub-bands, so as to obtain a more economical use of the available frequency spectrum consistent with operational requirements.

2.46 States should ensure that no air/ground frequency is utilized outside its designated operational coverage and that the stated operational requirements for coverage of a given frequency can be met for the transmission sites concerned, taking into account terrain configuration.

##### *Radio navigation aids for Aeronautical Radio Navigation Services (ARNS)*

2.47 Frequencies should be assigned to all radio navigation facilities taking into account agreed geographical separation criteria to ILS localizer, VOR and GBAS, X and Y channels to DME, in accordance with the principles laid out in Annex 10, Volume V and ICAO *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718) Volumes I and II. Also, the need for maximum economy in frequency demands and in radio spectrum utilization and a deployment of frequencies which ensures that international services are planned to be free of interference from other services using the same band, need to be considered.

2.48 The principles used for frequency assignment planning for radio navigation aids serving international requirements should, to the extent possible, also be used to satisfy the needs for national radio aids to navigation.

*Support to ICAO Positions for ITU World Radiocommunication Conferences (WRCs)*

2.49 Considering the importance and continuous demand of the radio frequency spectrum and for the protection of the current aeronautical spectrum and the allocation of new spectrum for the new services and system to be implemented in civil air navigation, States and international organizations are to support ICAO's position at ITU World Radiocommunication Conferences (WRCs) and in regional and other international activities conducted in preparation for ITU WRCs.

*Note: The Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718) Volume I, contains ICAO policy statements relevant to the aviation requirements for radio frequency spectrum. The handbook is intended to assist States and ICAO in preparing for ITU WRCs.*

### 3. SPECIFIC REGIONAL REQUIREMENTS

#### Communications

##### AFTN

3.1 States operating AFTN circuits which do not function satisfactorily 97 per cent of the time during which the circuit is scheduled to be in operation, should exchange monthly circuit performance data. Where a circuit consistently achieves 97 per cent reliability, the exchange of performance data may cease. The circuit performance data should be exchanged directly between the correspondent stations, with copies to the administrations concerned and to the ICAO Regional Office. States should also identify the causes for inadequate circuit performance and take necessary remedial measures.  
[ASIA/PAC/3, Conc. 10/2]

3.2 States responsible for the operation of AFTN circuits, which do not adequately meet transit time requirements should record transit time statistics on the twenty-third day of each third month (January, April, July and October) of each year, in accordance with the existing practices, for the AFTN circuits and terminals under their jurisdiction which do not meet the specified transit time criteria. The data recorded should be exchanged directly between the correspondent stations, with copies to administrations concerned and to the ICAO Regional Office.  
[ASIA/PAC/3, Conc.10/3]

##### *Common regional network services*

3.3 States should consider implementing digital communication networks or circuits in a coordinated manner in order to meet current and future AFS communication requirements for data/voice communications and to facilitate the introduction of ATN.  
[APANPIRG/11, Conc. 11/14]

#### Navigation

3.4 The navigation system to be used in the Asia and Pacific Regions is documented in the Navigation strategy and periodically reviewed by APANPIRG.

3.5 States should continue to provide ICAO with information on their flight inspection activities for inclusion in the ASIA/PAC Catalogue of Flight Inspection Units and circulation to States in the ASIA/PAC regions and to the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG).  
[ASIA/PAC/3, Conc. 12/8]

3.6 Unless otherwise specified by the APAC navigation strategy, States that have not yet done so should install VHF omnidirectional radio range (VOR) supplemented by distance measuring equipment (DME) as the primary aid for en-route navigation and, except in specified circumstances, delete any parallel requirement for a non-directional radio beacon (NDB) from the ANP.  
[ASIA/PAC/3, Rec. 5/22]

3.7 GNSS-enabled area navigation systems for all RNP navigation specifications are adopted as minimum requirement in the Asia/Pacific Region.  
[APANPIRG/22, Conc.22/22]

3.8 State aviation authorities, in partnership with other agencies of the State are requested to prohibit malicious and unintentional interference to GNSS and regulate legitimate uses of technology to preserve aviation utility of GNSS.

[APANPIRG/22, Conc.22/28]

3.9 In order to reduce the likelihood of CFIT accidents, States should review non-precision approach procedures with LNAV lines of minima to include CDFA profile and include the Baro-VNAV design in the current and new RNP APCH approaches and consequent LNAV/VNAV approach minima.

[APANPIRG/19, Conc.19/28]

#### **Surveillance**

##### *ADS-C*

3.10 The surveillance system to be used in the Asia and Pacific Regions is documented in the Surveillance strategy and periodically reviewed by APANPIRG.

3.11 The Global Operational Data Link Document (GOLD) edition 2 was adopted as Asia/Pacific regional guidance material for use by States and airspace users as the basis for operating Automatic Dependent Surveillance – Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC), in conjunction with Annex 10 – Aeronautical Telecommunications Volume II – Communications Procedures including those with PANS status and the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM Doc 4444).

[APANPIRG/20, Conc.20/73 and APANPIRG 24, Conc. 24/34]

##### *ADS-B*

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

[APANPIRG/14, Conc.14/20]

3.13 States are urged to consider following regional policy on supporting the provision of direct controller pilot communication capability associated with ADS-B data sharing between adjacent FIRs of States:

- in order to provide radar like separation services using ADS-B, it is necessary for the controllers to have direct controller pilot communication (DCPC).
- In some cases, to achieve radar like separation services it may be necessary for the States to provide VHF radio voice communication services for use by adjacent States.

It is therefore recommended that States capable to do so, support provision of VHF radio voice communication services to adjacent States when this is required to support the delivery of ADS-B based separation services. Cost of such service provision shall be agreed between the States concerned.

[APANPIRG/19, Conc.19/38]

3.14 States are urged to support provision of VHF radio voice air/ground communication infrastructure for use by adjacent States and States sharing ADS-B data and providing VHF voice air-ground communication infrastructure to adjacent States should co-ordinate with ICAO Regional Office and their national Telecommunication Regulatory Authority for assignment of specific VHF radio frequencies to be used by the adjacent States.

[APANPIRG/22, Conc.22/32]

##### *SSR*

3.15 In view of low density of SSR interrogator installations in the region, only Interrogator Identifier (not Surveillance Identifier) codes are used for SSRs Mode S in the areas of overlapping coverage.

[APANPIRG/19 Conc.19/40]

3.16 While implementing SSR Mode S, States should take into account following issues while assigning Interrogator Identifier codes for these installations:

- for planning the implementation of SSR Mode S administrations should ensure that the interrogators with overlapping coverage are not operating with the same Interrogator Identifier (II) codes
- where, the coverage of the interrogator extends beyond the boundaries of the State, The II code and PRF should be worked out in coordination with the ICAO Asia and Pacific Office and the neighboring States, and

3.17 Administrations should inform ICAO Asia and Pacific Office about the assigned II codes and PRFs for these installations.

[APANPIRG/19, Conc.19/40]

3.18 Recognizing more Mode S Radar ground stations being introduced in the region, States in the Asia and Pacific Regions are urged to have aircraft registered having Mode S transponder, regularly inspected to ensure correct operation of the Mode S transponders.

[APANPIRG17, Conc.17/29]

#### **Frequency Management**

3.19 The ICAO Regional Office, based on the information provided for this purpose by the States, will issue Frequency Lists Nos. 1, 2 and 3 at periodic intervals.

[ASIA/PAC/3, Conc. 11/4, 11/5 and 12/9]

3.20 In the case of an unidentified interfering station, States should notify the ICAO Regional Office, utilizing the procedure and report form developed by the Fifth Session of the Communications Division (1954) and updated by the Communications Divisional Meeting (1978). However, in the case of persistent harmful interference to an aeronautical service which may affect safety, it should be immediately reported to ICAO and to the ITU, using the prescribed format, for appropriate action.  
[ASIA/PAC/3, Conc. 11/6]

3.21 States, where aeronautical stations are experiencing HF radio interference, should take necessary actions in coordination with respective radio regulators to identify the source of interference and to eliminate the problem.  
[APANPIRG/17, Conc.17/32]

3.22 The provision of Aeronautical Mobile (R) Service in the Asia and Pacific Regions will be guided by the following strategy:

- The VHF voice service, backed by CPDLC and HF will be the primary communication medium for transcontinental traffic; and a combination of CPDLC and HF voice will be the communication medium for oceanic traffic.
- The requirement for basic voice communication will continue, supplemented by data-link Flight Information Service (DFIS) applications including D-VOLMET, D-ATIS and PDC to significantly reduce pressure on VHF spectrum congestion.

[APANPIRG/18, Conc. 18/29, partly]

**TABLE CNS II-1 - AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN**

**EXPLANATION OF THE TABLE**

*Column*

1 The AFTN Centres/Stations of each State are listed alphabetically. Each circuit appears twice in the table. The categories of these facilities are as follows:

- M - Main AFTN COM Centre
- T - Tributary AFTN COM Centre
- S - AFTN Station

2 Category of circuit:

- M - Main trunk circuit connecting Main AFTN communication centres.
- T - Tributary circuit connecting Main AFTN communication centre and Tributary AFTN Communications Centre.
- S - AFTN circuit connecting an AFTN Station to an AFTN Communication Centre.

3 Type of circuit provided:

- LTT/a - Landline teletypewriter, analogue (e.g. cable, microwave)
- LTT/d - Landline teletypewriter, digital (e.g. cable, microwave)
- LDD/a - Landline data circuit, analogue (e.g. cable, microwave)
- LDD/d - Landline data circuit, digital (e.g. cable, microwave)
- SAT/a/d - Satellite link, with /a for analogue or /d for digital

4 Circuit signalling speed in bits/s.

5 Circuit protocols

6 Data transfer code (syntax):

- ITA-2 - International Telegraph Alphabet No. 2 (5-unit Baudot code).
- IA-5 - International Alphabet No. 5 (ICAO 7-unit code).
- CBI - Code and Byte Independency (ATN compliant).

7 Remarks

**TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN**

**EXPLANATION OF THE TABLE**

*Column*

1 Name of the Administration and Location of the ATN Router

2 Type of Router (in end systems (ES) of the Administration shown in column 1)

## 3 Type of Interconnection:

Inter Regional: Connection between different Regions/ domains

Intra Regional: Connection within a Region/ domain.

4 Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1.

5 Bandwidth: Link Speed expressed in bits per second (bps)

6 Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)

7 Via: The media used to implement the interconnection of the routers. (in case of IP service bought from a service provider, indicate VPN)

DDN (public telecomm leased line)

VSAT

VPN

8 Remarks

**TABLE CNS II-3 - ATS DIRECT SPEECH CIRCUITS PLAN****EXPLANATION OF THE TABLE***Column*

1 and 2 Circuit terminal stations are listed alphabetically by the Terminal I.

3 A — indicates ATS requirement for the establishment of voice communication within 15 seconds.

D — indicates requirements for instantaneous communications.

4 Type of service specified:

LTF — landline telephone (landline, cable, UHF, VHF, satellite).

RTF — radiotelephone.

5 Type of circuits; Direct (DIR) or Switched (SW).

D — indicates a direct circuit connecting Terminals I and II.

S — indicates that a direct circuit does not exist and that the connection is established via switching at the switching centre(s) indicated in column 6.

IDD — International direct dialling by public switch telephone network

*Note 1.— Number of D and/or S circuits between Terminals I and II are indicated by numerical prefix, i.e. 2 D/S means 2 direct circuits and one switched circuit.*

*Note 2.— Pending the implementation of proper ATS voice circuits, and provided that aeronautical operational requirements are met, IDD services may be used for the ATS voice communications in low traffic areas.*

6 Location of switching centre(s). Alternate routing location, if available, is indicated in brackets.

7 Remarks

**TABLE CNS II-4 - HF NETWORK DESIGNATORS****EXPLANATION OF THE TABLE***Column*



1 Name of station, preceded by its location indicator.

2 Network designators assigned to the facility providing HF radiotelephony en-route communications (selected from the provisions of the allotment plan in Appendix S27 to the ITU Radio Regulations).

#### NOTES

The ICAO designators for HF MWARA and VOLMET networks in the Asia and Pacific Regions are derived from the ITU allotment area abbreviations as contained in Appendix S27 to the ITU Radio Regulations.

ITU allotment area:

Two- and three-letter alpha entries indicate major world air route areas (MWARA):

Four-letter alpha entries indicate VOLMET areas:

#### TABLE CNS II-5 - AIDC

#### TABLE CNS II-6 - RADIO NAVIGATION AIDS

#### EXPLANATION OF THE TABLE

##### Column

1 Name of the State and city (and aerodrome if different name than the city) or, for en-route aids, the location of the facility.

2 The designator number and runway type:

NINST — Visual flight runway  
 NPA — Non-precision approach runway  
 PA1 — Precision approach runway, Category I  
 PA2 — Precision approach runway, Category II  
 PA3 — Precision approach runway, Category III

and functions:

T — Terminal  
 E — En route

*Note.— Precision approach category refers to the standard of facility performance to be achieved and maintained in accordance with the relevant Annex 10 specifications and not to the specifications of the ILS equipment itself, which are not necessarily the same.*

3 ILS — Instrument landing system

4 L — Locator, either associated with an ILS or for use as an approach aid at an aerodrome.

5 DME — Distance measuring equipment. Aligned with the ILS shown in column 3 when the DME is required to serve as a substitute for a marker beacon. When aligned with VOR in column 6, indicates the DME to be collocated with the VOR.

6 VOR — VHF omnidirectional radio range.

7 Blank

8 Implementation Status for ILS

9 Implementation status for Locator

10 Implementation status for DME

11 Implementation status for VOR

12 Remarks

*Note.— Columns 3 to 6 use the following symbols:*

R — Required

Blank Entry would mean no requirement.

Note.— Columns 8 to 11 use the following symbols:

- I — Implemented.
- X — Implementation status undetermined. (in red)
- N — Not implemented. (in red)
- P — Planned (need to fill up Remarks column with planned implementation date in MM/YY format)

**Table CNS II-7 - SURVEILLANCE**

**EXPLANATION OF THE TABLE**

Column

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- 1       ATS Units to consider are ACC units and Approach units responsible for International airports and alternate aerodromes, International airports and alternate aerodromes.
- 2       The category may be: R, S, T or AD. Categories R,S, T are defined in the Seamless ATM plan. AD means Aerodrome.
- 3       Indicate Yes if part(s) of the airspace referred to in Column 2 is (are) not covered by surveillance listed in column 6, and in column remarks when such gaps are planned to be bridged
- 4       Indicate Yes or No.  
  
Indicate No in case of standalone displays of ATS surveillance data (should not be used operationally)
- 5       Indicate Yes or No
- 6       List all types of surveillance used:  
  
          PSR  
          SSRmS  
          SSRmAC  
          ADS-B  
          ADS-C  
          MLAT  
          WAM  
          PRM
- 7       According to the definition in Doc 9830 Appendix B
- 8       Remarks

[Return To Top](#)





SPACE > ANP > PART II - AOP

Last modified at 7/8/2015 8:09 AM by **LECAT, Frederic** [\[Edit this page\]](#)

ANP VOLUME III - PART II

PART II – AIR NAVIGATION SYSTEM IMPLEMENTATION

1. INTRODUCTION

1.1 The planning and implementation of the ICAO Aviation System Block Upgrades (ASBUs) should be undertaken within the framework of the APANPIRG with the participation and support of all stakeholders, including regulatory personnel.

1.2 The ASBU Blocks and Modules adopted by the APAC and Pacific Regions should be followed in accordance with the specific ASBU requirements to ensure global interoperability and harmonization of air traffic management. The APANPIRG should determine the ASBU Block Upgrade Modules, which best provide the needed operational improvements in the ICAO APAC and Pacific Regions.

2. ICAO APAC AIR NAVIGATION OBJECTIVES, PRIORITIES AND TARGETS

2.1 In accordance with Recommendation 6/1 of the Twelfth Air Navigation Conference (AN-Conf/12), PIRGs are requested to establish priorities and targets for air navigation, in line with the ASBU methodology.

2.2 The achievement of the intended benefits along each routing or within each area of affinity is entirely dependent on the coordinated implementation of the required elements by all provider and user stakeholders concerned.

2.3 Considering that some of the block upgrade modules contained in the GANP are specialized packages that may be applied where specific operational requirements or corresponding benefits exist, States and PIRGs should clarify how each Block Upgrade module would fit into the national and regional plans.

2.4 As Block 0 modules in many cases provide the foundation for future development, all Block 0 modules should be assessed, as appropriate, for early implementation by States in accordance with their operational needs.

2.5 In establishing and updating the APAC air navigation plan, the APAC States should give due consideration to the safety priorities set out in the Global Aviation Safety Plan (GASP) and RASG.

2.6 States in the APAC and Pacific Regions through the APANPIRG should establish their own air navigation objectives, priorities and targets to meet their individual needs and circumstances in line with the global and regional air navigation objectives, priorities and targets.

2.7 In 2014, APANPIRG/25 adopted the following regional priorities and targets (Conclusion APANPIRG 25/2):

Priority	ASBU module or SeamlessElement	Targets	Target date (Seamless ATM Phase 1 Plan)	Metric
PBN	B0-APTA	1. <b>Approach:</b> Where practicable, all high-density aerodromes with instrument runways serving aeroplanes should have precision approaches or APV or LNAV. <i>Note 1: High density aerodrome is defined by Asia-Pacific Seamless ATM Plan as aerodromes with scheduled operations in excess of 100,000/year.</i> <i>Note 2: the Asia/Pacific PBN Plan Version 3 required RNP APCH with Baro-VNAV or APV in 100% of instrument runways by 2016</i>	12 November 2015	% of high density aerodromes with precision approaches or APV or LNAV.
Network Operations	B0-NOPS	2. All High Density FIRs supporting the busiest Asia/Pacific traffic flows and high-density aerodromes should implement ATFM incorporating CDM using operational ATFM platform/s.  <i>Note: High Density FIRs are defined as:</i> <i>a) South Asia: Delhi, Mumbai;</i> <i>b) Southeast Asia: Bangkok, Hanoi, Ho Chi Minh, Jakarta, Kota Kinabalu, Manila, Sanya, Singapore, Vientiane; and</i> <i>c) East Asia: Beijing, Fukuoka, Guangzhou, Hong Kong, Kunming, Incheon, Shanghai, Shenyang, Taipei, Wuhan.</i> <i>[APANPIRG Conclusion 22/8 and 23/5 refer]</i>	12 November 2015	% of High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM
Aeronautical Information Management	B0-DATM	3. ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap	12 November 2015	% of Phase 1 and 2 AIS-AIM elements completed

Flight and Flow Information for a Collaborative Environment (FF-ICE)	B0-FICE	4. All States between ATC units where transfers of control are conducted have implemented the messages ABI, EST, ACP, TOC, AOC as far as practicable.	12 November 2015	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs
Civil/Military	B0-FRTO	5. Enhanced En-Route Trajectories: All States should ensure that SUA are regularly reviewed by the appropriate Airspace Authority to assess the effect on civil air traffic and the activities affecting the airspace.	12 November 2015	% of States in which FUA is implemented
Civil/Military	Strategic Civil Military coordination (Regional)	6. Enhanced En-Route Trajectories: All States should ensure that a national civil/military body coordinating strategic civil-military activities is established.	12 November 2015	% of States which have established a national civil/military body that performs strategic civil-military coordination
Civil/Military	Tactical Civil Military coordination (Regional)	7. Enhanced En-Route Trajectories: All States should ensure that formal civil military liaison for tactical response is established.	12 November 2015	% of States which have established a formal civil military liaison for tactical response
Ground Surveillance	B0-ASUR	8. All Category S upper controlled airspace and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B.	12 November 2015	% of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace
Ground Surveillance	B0-ASUR	9. ADS-B or MLAT or radar surveillance systems should be used to provide coverage of all Category S-capable airspace as far as practicable, with data integrated into operational ATC aircraft situation displays.	12 November 2015	% of ACCs with ATS Surveillance using ADS-B, MLAT or radar in Category S airspace, and having data integrated into the ATC system situation display
Trajectory-Based Operations-Data Link En-Route	B0-TBO	10. Within Category R airspace, ADS-C surveillance and CPDLC should be enabled to support PBN-based separations.	12 November 2015	% of FIRs using data link applications to support PBN-based separations in Category R airspace

2.8 All APAC objectives, priorities and targets are documented in the following APAC Main Planning Table. The APAC Main Planning Table is built upon the **Seamless ATM plan v1.0** which was adopted by APANPIRG/24:

Objectives					Priorities and targets				Reference			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements	Enablers	Priority allocated in APAC	Target(s) in APAC		Indicator(s) / Metric(s)	Supporting document (ANRF, other)		
							Nov. 2015 (Phase 1)	Nov. 2018 (Phase 2)				
0	Regional	1- Airport Operations	Yes	10	Apron Management	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should provide an appropriate apron management service in order to regulate entry of aircraft into and coordinate exit of aircraft from the apron;		% of high density international aerodromes (100,000 scheduled movements per annum or more) providing an appropriate apron management service		Seamless Plan V1R0	
0	Regional	1- Airport Operations	Yes	20	ATM-Aerodrome Coordination	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should have appropriate ATM coordination on airport development and maintenance planning; coordination with local authorities regarding environmental, noise abatement, and obstacles; and ATM/PBN procedures for the aerodrome		% of high density international aerodromes having appropriate ATM coordination in accordance with the Seamless ATM Plan		Seamless Plan V1R0	
0	Regional	1- Airport Operations	Yes	30	Aerodrome capacity	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should have a declared airport terminal and runway capacity	All high density aerodromes should have a declared airport terminal and runway capacity	% of high density international aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 1	% of high density aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 2		Seamless Plan V1R0
0	B0-SURF	1- Airport Operations	Yes	40	Safety and Efficiency of Surface Operations	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should have provide electronic surface movement guidance and control.		% of applicable international aerodromes having implemented A-SMGCS Level 2		ANRF B0-SURF	
0	B0-RSEQ	1- Airport Operations	Yes	50		2	All high density aerodromes should have AMAN/DMAN facilities	All AMAN systems should take into account airport gates for runway selection and other				Seamless Plan V1R0

					Arrival Manager/Departure Management (AMAN/DMAN)			aircraft departures from adjacent gates that may affect arriving aircraft	% of applicable international aerodromes having implemented AMAN / DMAN (applicable = high density)	% of applicable international aerodromes having implemented AMAN / DMAN (applicable = high density)	
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	60	ATC Sector Capacity	2		All all enroute ATC sectors and terminal ATC Sectors should have a nominal aircraft capacity figure based on a scientific capacity study and safety assessment, to ensure safe and efficient aircraft operations.		% of ATC sectors with capacity figures in accordance with Seamless ATM Phase 2	Seamless Plan V1R0
0	B0-ACDM	1- Airport Operations	Yes	70	Airport Collaborative Decision-Making (ACDM)	2	Airport CDM at all high density aerodromes.		% of applicable international aerodromes having implemented improved airport operations through airport-CDM (applicable=high density)		ANRF B0-CDM
0	B0-NOPS	3- Optimum Capacity and Flexible Flights	Yes	80	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	1	All high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement ATFM incorporating CDM using operational ATFM platform/s.	All FIRs supporting Major Traffic Flows should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements	% of High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM	% of FIRs supporting Major Traffic Flows should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements	ANRF B0-NOPS
0	B0-CDO	4- Efficient Flight Path	Yes	90	Continuous Descent Operations (CDO)	2	All high density international aerodromes implement CCO and CDO operations where States have assessed it applicable		% of International aerodromes/TMA where CDO is implemented		ANRF B0-APTA - CCO - CDO
0	B0-CCO	4- Efficient Flight Path	Yes	100	Continuous Climb Operations (CCO)	2	All high density international aerodromes implement CCO and CDO operations where States have assessed it applicable		% of international aerodromes where CCO is implemented		ANRF B0-APTA - CCO - CDO
0	B0-APTA	1- Airport Operations	Yes	110	Performance-based Navigation (PBN) Approach	1	Where practicable, all high density aerodromes with instrument runways serving aeroplanes should have precision approaches or APV or LNAV	Where practicable, all aerodromes with instrument runways serving aeroplanes should have precision approaches or APV or LNAV	% of high density aerodromes with precision approaches or APV or LNAV (High density aerodrome is defined by Asia-Pacific Seamless ATM Plan as aerodromes with scheduled operations in excess of 100,000/year)	No input needed here - Measured through the Regional Performance Dashboard: % of international aerodromes having at least one runway end provided with APV Baro-VNAV or LPV procedures	ANRF B0-APTA - CCO - CDO
0	B0-CCO B0-CDO	1- Airport Operations	Yes	120	Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	2	All international high density aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) SID/STAR	All international aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) SID/STAR	% of International aerodromes / TMAs with PBN STAR implemented	% of international aerodromes / TMAs with PBN SID implemented	ANRF B0-APTA - CCO - CDO
0	Regional	4- Efficient Flight Path	Yes	130	Performance-based Navigation (PBN) Visual Departure and Arrival Procedures	3		PBN procedures that overlay visual arrival and departure procedures should be established where this provided an operational advantage		% of high density aerodromes with PBN procedures that overlay visual arrival and departure procedures	Seamless Plan V1R0
0	B0-FRTO	4- Efficient Flight Path	Yes	140	Performance-based Navigation (PBN) Routes	2	All ATS routes should be designated with a navigation performance specification for category R airspace RNP 4 or RNP 10 (RNAV 10) or RNP 2 oceanic; and for Category S airspace RNAV 2 or RNP 2	All ATS routes should be designated with a navigation performance specification RNP 2	% of ATS routes designated as PBN routes in accordance with Seamless ATM Phase 1	% of ATS routes designated as PBN routes in accordance with Seamless ATM Phase 2	ANRF to be developed
0	Regional	4- Efficient Flight Path	Yes	150	Performance-based Navigation (PBN) Airspace	2	All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive PBN airspace as appropriate.		Are all your Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes designated as non-exclusive or exclusive PBN airspace as appropriate.? (1- yes, 0-no)		Seamless Plan V1R0
0	B0-SNET	3- Optimum Capacity and Flexible Flights	Yes	160	Safety Nets	2		ATM systems providing services within Category R airspace should enable appropriate ATC capabilities including CPAR, which is a key enabler for UPR and DARP operations	Does your State implement ground-based safety nets (STCA, APW, MSAW, etc.)? (1- yes, 0-no)	% of ACCs using CPAR in R airspace in accordance with Seamless ATM Phase 2	ANRF B0-SNET
0	B0-ACAS	3- Optimum Capacity and Flexible Flights	Yes	170	Airborne Safety Systems	2	All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should require the carriage of ACAS and Terrain Awareness Warning Systems (TAWS), unless approved by ATC	All Category R and S upper controlled airspace, and Category T airspace should, unless approved by the State, require the carriage of an operable ACAS and TAWS	% of States/Administrations requiring the carriage of ACAS (with TCAS 7.1 evolution)	% of States/Administrations requiring the carriage of TAWS? (1- yes, 0-no)	ANRF B0-ACAS
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	180	ATS Surveillance	1	All Category S upper controlled airspace and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B	All Category S upper controlled airspace and Category T airspace should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B using 1090ES with DO-280/280A and 280B capability. In areas where ADS-B based separation service is provided, the mandatory carriage of ADS-B OUT using 1090ES with DO280/80A and 280B should be prescribed	% of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace?	% of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace?	ANRF B0-ASUR
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	190	Airspace classification	2	Harmonization of upper airspace classification should be as follows: a) Category R controlled airspace- Class A; and b) Category S controlled airspace- Class A, or if there are high level general aviation or military VFR operations: Class B or C.		% of States/Administrations having harmonized the upper airspace classification as follows: a) Category R controlled airspace- Class A; and b) Category S controlled airspace- Class A, or if there are high level general aviation or military VFR operations: Class B or C.? (1- yes, 0-no)		Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	200	Flight Level Orientation Schemes (FLOS)	2	The ICAO Table of Cruising Levels based on feet as contained in Appendix 3a to Annex 2 should be used.		% of States/Administrations using the ICAO Table of Cruising Levels based on feet as contained in Appendix 3a to Annex 2 ? (1- yes, 0 -no)		Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	210	Flight Level Allocation Schemes (FLAS)	2	Priority for FLAS level allocations should be given to higher density ATS routes over lower density ATS routes. Any aircraft that does not meet specified		% of States/Administrations having their Operations Manual give priority for FLAS level allocations to higher density ATS routes over lower density ATS routes, and a lower priority to		Seamless Plan V1R0

						equipe requirements should receive a lower priority		any aircraft that does not meet specified equipage ? (1- yes, 0-no)			
0	B0-FICE	2- Globally Interoperable Systems & Data	Yes	220	ATS Inter-facility Data-link Communications (AIDC)	1	ATM systems should enable AIDC between ATC units where transfers of control are conducted. As far as practicable, the AIDC messages types ABI, EST, ACP, TOC, AOC should be implemented.	Implement full AIDC messaging, or alternate communication standard.	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	% of FIRs within which all applicable ACCs have implemented full AIDC messaging, or alternate communication standard	ANRF B0-FICE
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	230	Automated Transfer of Control	2	Where practicable, all ATC Sectors within the same ATC unit with ATS surveillance capability should have automated hand-off procedures that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling	Where practicable, all ATC Sectors with adjacent ATC Centres using ATS surveillance capability should have automated hand-off procedures that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling	% of ATC sectors with automated hand-off procedures in accordance with Seamless ATM Plan Phase 1	% of ATC sectors with automated hand-off procedures in accordance with Seamless ATM Plan Phase 2	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	240	ATS Surveillance data sharing	2	Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with neighbouring ATC units within high density FIRs	Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with all neighbouring ATC units	% of ACCs within high density FIRs (as per the Seamless ATM Plan) sharing ATS surveillance data	% of ACCs sharing ATS surveillance data	Seamless Plan V1R0
0	B0-APTA	3- Optimum Capacity and Flexible Flights	Yes	250	ATM systems enabling optimal PBN/ATC operations	2	ATM systems, including communication and ATS surveillance systems and the performance of those systems, should support the capabilities of PBN navigation specifications and ATC separation standards applicable within the airspace concerned	ATM system design should be planned and implemented to support optimal aerodrome capacity expectations for the runway(s) concerned. Electronic flight progress strips should be utilised wherever practicable.	% of ATC units with ATM systems enabling optimal PBN operations	% of ATC units with ATM systems supporting optimal aerodrome capacity and using electronic flight progress strips	ANRF B0-APTA - CCO - CDO
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	260	ATC Horizontal separation	2	All ATC units should authorise the use of the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable.		% of States/Administrations having their AIP authorising the use of the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable ? (1- yes, 0-no)		Seamless Plan V1R0
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	270	ATS surveillance with data integrated	1	ADS-B or MLAT or radar surveillance systems should be used to provide coverage of all Category S-capable airspace as far as practicable, with data integrated into operational ATC aircraft situation displays		% of ACCs with ATS Surveillance using ADS-B, MLAT or radar in Category S airspace, and having data integrated into the ATC system situation display		ANRF B0-ASUR
0	B0-TBO	4- Efficient Flight Path	Yes	280	ADS-C and CPDLC	1	Within Category R airspace (remote en-route airspace within ATS communications and surveillance coverage dependent on a third-party CSP), ADS-C surveillance and CPDLC should be enabled to support PBN-based separations		% of FIRs utilising data link en-route in applicable airspace		ANRF B0-TBO
0	B0-FRTO	4- Efficient Flight Path	Yes	290	UPR and DARP	3	Within Category R airspace, UPR and DARP should be enabled to support PBN-based separations		% of FIRs using UPR and DARP within R airspace		ANRF B0-FRTO
0	B0-DATM	2- Globally Interoperable Systems & Data	Yes	300	Aeronautical Information Management	1	ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap	ATM systems should be supported by digitally-based AIM systems through implementation of Phase 3 of the AIS-AIM Roadmap	% Phase 1 and 2 AIS-AIM elements completed (0-13)	% of Phase 3 AIS-AIM elements completed (0-8)	ANRF B0-DATM
0	B0-AMET	2- Globally Interoperable Systems & Data	Yes	310	Meteorological Information	2	All high density aerodromes should provide meteorological forecasts, aerodrome warnings and alerts that support efficient terminal operations. ATM systems should be supported by implementation of appropriate meteorological information reporting systems.		% of high density aerodromes providing meteorological forecasts, aerodrome warnings and alerts		ANRF to be developed
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	320	ATM Managers' Performance	2	Human performance training for all ANSP managers, including management of risks related to human capabilities and limitations; effective participation in a team and team management, effective safety reporting systems, human factors in air safety investigation, fatigue management approaches	Prevention of fatigue systems should be established to support human performance in the delivery of a Seamless ATM service	% of States/Administrations having their Operations Manual require the human performance training for all ANSP managers	% of States/Administrations having a prevention of fatigue systems established to support human performance in the delivery of your ATM services	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	330	ATC simulators performance	2	Enhancement and improved application of ATC simulators should be established to support human performance in the delivery of a Seamless ATM service		% of States/Administrations having a programme for enhancement and improved application of ATC simulators		Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	340	Safety assessment of changes	2	Safety teams comprising multidisciplinary operational staff and managers which review safety performance and assess significant proposals for change to ATM systems should be established to support human performance in the delivery of a Seamless ATM service		% of States/Administrations having safety teams comprising multidisciplinary operational staff and managers which review safety performance and assess significant proposals for change to ATM systems		Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	350	ATM Operators' performance	2	Human performance-based training and procedures for staff providing ATS should be established to support human performance in the delivery of a Seamless ATM service		% of States/Administrations having human performance-based training and procedures for staff providing ATS		Seamless Plan V1R0
0	B0-FRTO	3- Optimum Capacity and	Yes	360	Civil Military use of SUA	1	All States should ensure that SUA are regularly reviewed by the appropriate		% of FIRs in which FUA is implemented		ANRF B0-FRTO

		Flexible Flights					Airspace Authority to assess the effect on civil air traffic and the activities affecting the airspace			
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	370	Strategic Civil Military coordination	1	All States should ensure that a national civil/military body coordinating strategic civil-military activities is established		% of States/Administrations having established a national civil/military body that performs strategic civil-military coordination	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	380	Tactical Civil Military coordination	1	All States should ensure that formal civil-military liaison for tactical responses is established		% of States/Administrations having you established a formal civil military liaison for tactical response	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	390	Civil Military system integration	2	Civil and military ATM systems integrated using joint procurement, and sharing of ATS surveillance data (especially from ADS-B systems) should be provided as far as practicable		% of States/Administrations having their civil ATS and military systems integrated	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	400	Civil Military nav aids joint provision	2	Joint provision of civil/military navigation aids should be encouraged;		% of States/Administrations having their joint civil and military navigation aids	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	410	Civil Military common training	2	Common training should be conducted between civil and military ATM units in areas of common interest;		% of States/Administrations having Civil Military common training conducted in areas of common interest	Seamless Plan V1R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	420	Civil Military common procedures	2	Civil and military ATM units should utilize common procedures as far as practicable		% of States/Administrations having common procedures for Civil Military operations where appropriate	Seamless Plan V1R0
0	B0-ASEP	3- Optimum Capacity and Flexible Flights	No	430	Air traffic situational awareness	2		Nil	% of States/Administrations implementing air traffic situational awareness	Nil
0	B0-WAKE	1- Airport Operations	No	440	Optimized wake turbulence separation	3		Nil	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	Nil
0	B0-OPFL	3- Optimum Capacity and Flexible Flights	No	450	In-trail procedures	3		Nil	% of FIRs having implemented in-trail procedures	Nil

**3. MONITORING OF ASBU MODULES IMPLEMENTATION**

3.1 The monitoring of air navigation performance and its enhancement should be carried out through identification of relevant air navigation Metrics and Indicators as well as the adoption and attainment of air navigation system Targets.

3.2 The monitoring of the regional implementation progress and performance metrics/indicators should be done for all elements planned by APANPIRG. The monitoring should allow global correlation of status and expectations, appreciation of benefits achieved for the airspace users, as well as corrective actions to be taken by the PIRG on implementation plans.

3.3 The APANPIRG should determine appropriate mechanisms and tools for the monitoring and the collection of necessary data at national and regional levels.

**Data collection**

3.4 APAC States/Administrations are urged to report on their Seamless ATM implementation progress at least once a year through the ICAO online reporting process from November 2014 onwards (Conclusion 25/5). The Web-based Seamless ATM Implementation Progress Reporting Process is available here (secured access): [https://portal.icao.int/RO\\_APAC/Reporting/Pages/default.aspx](https://portal.icao.int/RO_APAC/Reporting/Pages/default.aspx).

3.5 The list of Points of Contact for the Reporting Process is available here: [https://portal.icao.int/RO\\_APAC/Reporting/Lists/Point%20of%20Contact/AllItems.aspx](https://portal.icao.int/RO_APAC/Reporting/Lists/Point%20of%20Contact/AllItems.aspx).

**Monitoring through the regional picture and Regional Performance Dashboards**

3.6 The progress of ANS implementation against the objectives and targets set forth in the APAC Main Planning Table above is tracked through a series of bar graphs, forming a regional picture that is periodically updated. The latest version is available here: [https://portal.icao.int/RO\\_APAC/Reporting/Documents/Regional%20Picture.pdf](https://portal.icao.int/RO_APAC/Reporting/Documents/Regional%20Picture.pdf) (secured access).

3.7 The Regional Performance Dashboards aim to provide a glance of both Safety and Air Navigation Capacity and Efficiency strategic objectives, using a set of indicators and targets based on the regional implementation of the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan (GANP). The progress can be checked here: <http://www.icao.int/safety/Pages/Regional-Targets.aspx#tabs-2>.

**Implementation guidance**

3.8 The Seamless ATM implementation guidance was adopted by APAC States/Administrations and is maintained by the ICAO Regional Office (Conclusion 25/4). Its latest version is the version 4.3, May 2014 which is available here: <http://www.icao.int/APAC/Documents/edocs/Seamless%20ATM%20Implementation%20Guidance%20v4-3.pdf>.

**Additional guidance for implementation**



[Return to Top](#)

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**TABLE CNS II-1 AERONAUTICAL FIXED TELECOMMUNICATIONS  
NETWORK (AFTN) PLAN**

EXPLANATION OF THE TABLE

*Column*

- 1 The AFTN Centres/Stations of each State are listed alphabetically. Each circuit appears twice in the table. The categories of these facilities are as follows:
- M - Main AFTN COM Centre
  - T - Tributary AFTN COM Centre
  - S - AFTN Station
- 2 Category of circuit:
- M - Main trunk circuit connecting Main AFTN communication centres.
  - T - Tributary circuit connecting Main AFTN communication centre and Tributary AFTN Communications Centre.
  - S - AFTN circuit connecting an AFTN Station to an AFTN Communication Centre.
- 3 Type of circuit provided:
- LTT/a - Landline teletypewriter, analogue (e.g. cable, microwave)
  - LTT/d - Landline teletypewriter, digital (e.g. cable, microwave)
  - LDD/a - Landline data circuit, analogue (e.g. cable, microwave)
  - LDD/d - Landline data circuit, digital (e.g. cable, microwave)
  - SAT/a/d - Satellite link, with /a for analogue or /d for digital
- 4 Circuit signalling speed in bits/s.
- 5 Circuit protocols
- 6 Data transfer code (syntax):
- ITA-2 - International Telegraph Alphabet No. 2 (5-unit Baudot code).
  - IA-5 - International Alphabet No. 5 (ICAO 7-unit code).
  - CBI - Code and Byte Independency (ATN compliant).
- 7 Remarks

**TABLE CNS II – 1 AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN**

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>AFGHANISTAN</b>						
<b>Kabul/OAKB</b>						
Karachi/OPKC	S	SAT/d	2400 bps	None	IA-5	
Tehran/OIII	S	LDD/d	2400 bps	None	IA-5	
<b>AMERICAN SAMOA</b>						
<b>Pago Pago/NSTU</b>						
Salt Lake City/KSLC	S	LDD/d	2400 bps	IP	IA-5	
<b>AUSTRALIA</b>						
<b>Brisbane/YBBB</b>						
Christchurch/NZCH	T	LDD/d	9600 bps	X.25	IA-5	MPLS VPN AMHS-IPS 2017
Honiara/AGGG	S	LDD/d	N/A	HTTP	IA-5	INTERNET
Jakarta/WIII	S	SAT/d	64 Kbps	AMHS/IPS	IA-5	IP VPN
Makassar/WAAA	S				IA-5	IP VPN for AIDC

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Nadi/NFFN	M	LDD/d	64 Kbps	AMHS/OSI	IA-5	INTERNET
Nauru/ANAU	S	LDD/d	N/A	HTTP	IA-5	
Port Moresby/AYPM	S	LDD/d	128 Kbps	IP	IA-5	INTERNET
Port Vila/NVVV	S	LDD/d	N/A	HTTP	IA-5	INTERNET
Dili/WPDL	S	LDD/d	N/A	HTTP	IA-5	INTERNET
Singapore/WSSS	M	LDD/d	64 Kbps	X.25	IA-5	AMHS/OSI 2015
United States/KSLC	M	LDD/d	64 Kbps	X.25	IA-5	MPLS/VPN AMHS/IPS 2017
Johannesburg/FAOR	M	LDD/d	64 Kbps	X.25	IA-5	IP VPN
<b>BANGLADESH</b>						
<b>Dhaka/VGHS</b>						
Bangkok/VTBB	S	SAT/d	32 Kbps	None	IA-5	
Kolkata/VECC	S	LDD/d	64 Kbps	X.25	IA-5	
<b>BHUTAN</b>						
<b>Paro/VQPR</b>						
Mumbai/VABB	S	SAT/a	900 baud	None	ITA-2	Plan to upgrade to 64 Kbps 2017 LDD/d using IA5 X.25

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Bangkok/VTBB	S	SAT/a	900 baud	None	ITA-2	Plan to upgrade to 64 Kbps 2017 LDD/d using IA5 X.25
<b>BRUNEI DARUSSALAM</b>						
<b>Brunei/WBSB</b>						
Singapore/WSSS	S	LDD/d	64 Kbps	X.25	IA-5	
Kuala Lumpur/WMKK	S	LDD/d	9600 bps	X.25	IA-5	
<b>CAMBODIA</b>						
<b>Phnom Penh/VDPP</b>						
Bangkok/VTBB	S	SAT/d	64 Kbps	None	IA-5	
<b>CHINA</b>						
<b>Beijing/ZBBB</b>						
Bangkok/VTBB	M	SAT/da	2400 bps	X.25	IA-5	
Guangzhou/ZGGG	M	LDD/d	64 Kbps	X.25	IA-5	
Karachi/OPKC	M	LDD/d	2400 bps	X.25	IA-5	
Kathmandu/VNKT	S	SAT/d	300 bps	None	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Russian Federation/UHHH	M	LDD/d	64 Kbps	X.25	IA-5	
Pyongyang/ZKKK	S	SAT/d	9600 bps	X.25	IA-5	
Seoul/RKSS	S	SAT/d	9600 bps	X.25	IA-5	
Fukuoka/RJJJ	S	LDD/d	64 Kbps	X.25	IA-5	
Ulaan Baatar/ZMUB	S	LDD/d	64 Kbps	X.25	IA-5	
Yangon/VYYY	S	SAT/d	4800 bps	X.25	IA-5	
<b>Guangzhou/ZGGG</b>						
Beijing/VTBB	M	LDD/d	64 Kbps	X.25	IA-5	
Hanoi/VVNB	S	SAT/d	300 bps	None	IA-5	
Hong Kong/VHHH	M	LDD/d	2400 bps	None	IA-5	
Macau/VMMC	S	LDD/d	2400 bps	None	IA-5	
Haikou/ZJHK	S	LDD/d	9600 bps	None	IA-5	
<b>Haikou/ZJHK</b>						
Guangzhou/ZGGG	S	LDD/d	9600 bps	None	IA-5	
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Taipei/RCTP</b>						
Hong Kong/VHH	S	LDD/d	4800 bps	X.25	IA-5	
Manila/RPLL	S	LDD/d	300 bps	None	ITA-2	
Fukuoka/RJJJ	S	LDD/d	64 Kbps	X.25	IA-5	
<b>Hong Kong China/VHHH</b>						
Bangkok/VTBB	M	LDD/d	64 Kbps	X.25	IA-5	
Guangzhou/ZGGG	M	LDD/d	2400 bps	None	IA-5	
Ho Chi Minh/VVTS	S	LDD/d	2400 bps	None	IA-5	
Macau/VMMC	S	LDD/d	64 Kbps	X.25	IA-5	
Manila/RPLL	S	LDD/d	9600 bps	X.25	IA-5	
Haikou/ZJHK	S	LDD/d	2400 bps	None	IA-5	
Taipei/RCTP	S	LDD/d	4800 bps	X.25	IA-5	
Fukuoka/RJJJ	M	LDD/d	64 Kbps	X.25	IA-5	
<b>MACAU CHINA</b>						

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Macau/VMMC</b>						
Hong Kong/VHHH	S	LDD/d	64 Kbps	X.25	IA-5	
Guangzhou/ZGGG	S	LDD/d	2400 bps	None	IA-5	
<b>COOK ISLANDS</b>						
<b>Rarotonga/NCRG</b>						
Christchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5	
<b>DPR KOREA</b>						
<b>Pyongyang/ZKKK</b>						
Beijing/ZBBB	S	LDD/d	2400 bps	X.25	IA-5	
<b>FIJI</b>						
<b>Nadi/NFFN</b>						
Brisbane/YBBB	M	LDD/d	64 Kbps	AMHS/OSI	IA-5	
Funafuti/NGFU	S	SAT/d	Internet	IP	IA-5	VPN over Internet
Noumea/NWWW	S	SAT/d	9600 bps	Asynch.	IA-5	

Table II-1



State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Tarawa/NGTT	S	SAT/d	Internet	IP	IA-5	VPN over Internet
United States/KSLC	M	LDD/d	9600 bps	X.25	IA-5	
Wallis Is./NLWW	S	SAT/d	9600 bps	Asynch.	IA-5	Via Noumea
<b>FRENCH POLYNESIA (France)</b>						
<b>Papeete (NTAA)</b>						
Christchurch/NZCH	S	LDD/d	64 Kbps	X.25	IA-5	
<b>INDIA</b>						
<b>Mumbai/VABB</b>						
Bangkok/VTBB	M	LDD/d	64 Kbps	X.25	IA-5	
Kolkata/VECC	S	LDD/d	64 Kbps	X.25	IA-5	
Colombo/VCCC	S	LDD/d	64 Kbps	X.25	IA-5	
Karachi/OPKC	M	SAT/d	2400 bps	None	IA-5	
Kathmandu/VNKT	S	SAT/a	50 bauds	None	ITA-2	
Muscat/OOMS	M	SAT/a	300 bauds	None	ITA-2	
Nairobi/HKNA	M	SAT/a	50 bauds	None	ITA-2	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Paro/VQPR	S	SAT/a	900 bauds	None	ITA-2	Plan to upgrade to 64 Kbps 2017 LDD/d using IA5 X.25
Singapore/WSSS	M	LDD/d	64 Kbps	X.25	IA-5	
<b>Kolkata/VECC</b>						
Dhaka/VGZR	S	LDD/d	64 Kbps	None	IA-5	
Mumbai	S	LDD/d	64 Kbps	X.25	IA-5	
<b>Delhi/VIDP</b>						
Tashkent/UTTT	S	SAT/a	50 bauds	None	ITA-2	
<b>Chennai/VOMM</b>						
Kuala Lumpur/WMKK	S	LDD/d	64 Kbps	None	IA-5	
<b>INDONESIA</b>						
<b>Jakarta/WIII</b>						
Brisbane/YBBB	S	SAT/d	64 Kbps	AMHS/IPS	IA-5	IP VPN
Singapore/WSSS	S	LDD/d	128 Kbps	X.25	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Makassar/WAAA</b>						
Brisbane/YBBB	S					IP VPN for AIDC
<b>JAPAN</b>						
<b>Fukuoka-M/RJJJ</b>						
Beijing/ZBBB	M	LDD/d	64 Kbps	X.25	IA-5	
Hong Kong/VHHH	M	LDD/d	9600 bps	X.25	IA-5	
Russian Federation/UUUU	M	LTT	64 Kbps	X.25	IA-5	
Seoul/RKSS	S	LDD/d	9600 bps	X.25	IA-5	
Singapore/WSSS	M	LDD/d	9600 bps	X.25	IA-5	
United States/KSLC	M	LDD/d	64 Kbps	X.25	-	
Taibei/RCTP	S	LDD/d	64 Kbps	X.25	IA-5	
<b>KIRIBATI</b>						
<b>Tarawa-S/NGTT</b>						
Nadi/NFFN	S	SAT/d	Internet	IP	IA-5	VPN over Internet

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>LAO PDR</b>						
<b>Vientiane-S/VLVT</b>						
Bangkok/VTBB	S	SAT/d	32 kbps	None	IA-5	
Hanoi/VVNB	S	SAT/d	2400 bps	None	IA-5	
<b>MALASIA</b>						
<b>Kuala Lumpur-S/WMKK</b>						
Bangkok/VTBB	S	SAT/d	64 Kbps	None	IA-5	
Brunei/WBSB	S	LDD/d	9600 bps	X.25	IA-5	
Chennai/VOMM	S	LDD/d	9600 bps	X.25	IA-5	
Singapore/WSSS	S	SAT/d	64 Kbps	X.25	IA-5	
<b>MALDIVES</b>						
<b>Male-S/VRMM</b>						
United States/KSLC	S	SAT/d	9600 bps	X.25	IA-5	
<b>MARSHALL ISLAND</b>						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Majuro-S/PKMJ</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	
<b>MICRONESIA</b>						
<b>FEDERATED STATES OF</b>						
<b>Chuuk-S/PTKK</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	
<b>Kosrae-S/PTSA</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	
<b>Ponapei-S/PTPN</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	
<b>YAP-S/PTYA</b>						
<b>YAP-S/PTYA</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>MONGOLIA</b>						
<b>Ulaanbaatar-S/ZMUB</b>						
Beijing/ZBBB	S	LDD/d	64 Kbps	X.25	IA-5	
Russian Federation/UIII	S	LDD/d	9600 bps	X.25	IA-5	
<b>MYANMAR</b>						
<b>Yangon-S/VYYY</b>						
Bangkok/VTBB	S	SAT/d	48 Kbps	None	IA-5	
Beijing/ZBBB	S	SAT/d	4800 bps	X.25	IA-5	
<b>NAURU</b>						
<b>Nauru-S/ANAU</b>						
Brisbane/YBBB	S	LDD/d	N/A	HTTP	IA-5	Internet
<b>NEPAL</b>						
<b>Katmandu-S/VNKT</b>						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Beijing/ZBBB	S	SAT/d	300 baud	None	IA-5	
Mumbai/VABB	S	SAT/a	50 baud	None	ITA-2	
<b>NEW CALEDONIA (FRANCE)</b>						
<b>Noumea-S/NWWW</b>						
Nadi/NFFN	S	SAT/d	9600 bps	Asynch.	IA-5	
<b>NEW ZEALAND</b>						
<b>Christchurch-T/NTCH</b>						
Faleolo/NSFA	S	LDD/d	2400 bps	X.25	IA-5	
Brisbane/YBBB	T	LDD/d	2400 bps	X.25	IA-5	MPLS VPN AMHS-IPS 2017
Niue/NIUE	S	E-mail				
Papeete/NTAA	S	SAT/d	bps	IP	IA-5	
Rarotonga/NCRG	S	LDD/d	2400 bps	X.25	IA-5	
Tongatapu/NFTF	S	LDD/d	2400 bps	X.25	IA-5	
USA/KSLC	M	LDD/d	9600 bps	X.25	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>NIUE IS</b>						
<b>Niue-S/NIUE</b>						
Christchurch/NZCH	S					
<b>PAKISTAN</b>						
<b>Karachi-M/OPKC</b>						
Beijing/ZBBB	M	LDD/d	2400 bps	None	IA-5	
Mumbai/VABB	M	SAT/d	2400 bps	None	IA-5	
Kabul/OAKB	S	SAT/d	2400 bps	None	IA-5	
Kuwait/OKBK	M	LDD/d	2400 bps	None	IA-5	
<b>PALAU</b>						
<b>Koror-S/PTRO</b>						
United States/KSLC	S	Internet	64 Kbps	IP	IA-5	
<b>PAPUA NEW GUINEA</b>						



State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Port Moresby-S/AYPM</b>						
Brisbane/YBBB	S	LDD/d	128 Kbps	IP	IA-5	
<b>PHILIPPINES</b>						
<b>Manila-S/RPLL</b>						
Hong Kong/VHHH	S	LDD/d	9600 bps	X.25	IA-5	
Singapore/WSSS	S	LDD/d	64 Kbps	X.25	IA-5	
Taipei/RCTP	S	LDD/d	300 baud	None	ITA-2	
<b>REPUBLIC OF KOREA</b>						
<b>Seoul-S/RKSS</b>						
Beijing/ZBBB	S	SAT/d	9600 bps	X.25	IA-5	
Fukuoka/RJJJ	S	LDD/d	9600 bps	X.25	IA-5	
<b>SAMOA</b>						
<b>Faleolo-S/NSFA</b>						
Christchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5	

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>SINGAPORE</b>						
<b>Singapore-M/WSSS</b>						
Bahrain/OBBI	M	LTT/d	64 Kbps	X.25	IA-5	
Bangkok/VTBB	M	LDD/d	64 Kbps	X.25	IA-5	
Brisbane/YBBB	M	LDD/d	64 Kbps	X.25	IA-5	AMHS/OSI 2015
Brunei/WBSB	S	LDD/d	64 Kbps	X.25	IA-5	
Colombo/VCCC	S	LDD/d	64 Kbps	X.25	IA-5	
Ho-Chi-Minh/VVTS	S	LDD/d	128 Kbps	X.25	IA-5	
Jakarta/WIII	S	LDD/d	128 Kbps	X.25	IA-5	
Kuala Lumpur/WMKK	S	SAT/d	64 Kbps	X.25	IA-5	
Mumbai/VABB	M	LDD/d	64 Kbps	X.25	IA-5	
London/EGGG	M	LDD/d	128 Kbps	None	IA-5	
Manila/RPLL	S	LDD/d	64 Kbps	X.25	IA-5	
Fukuoka/RJJJ	M	LDD/d	9600 bps	X.25	IA-5	
<b>SOLOMON IS.</b>						
<b>Honiara-S/AGGG</b>						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Brisbane/YBBBB	S	LDD/d	N/A	HTTP	IA-5	Internet
<b>SRI LANKA</b>						
<b>Colombo-M/VCCC</b>						
Mumbai/VABB						
Male/VRMM						
Singapore/WSSS						
<b>THAILAND</b>						
<b>Bangkok-M/VTBB</b>						
Beijing/ZBBB	M	SAT/d	2400 bps	X.25	IA-5	
Mumbai/VABB	M	LDD/d	64 Kbps	X.25	IA-5	
Dhaka/VGHS	S	SAT/d	32 Kbps	None	IA-5	
Ho Chi Minh/VVTS	S	SAT/d	2400 bps	X.25	IA-5	
Hong Kong/VHHH	M	LDD/d	64 Kbps	X.25	IA-5	
Kuala Lumpur/WMKK	S	SAT/d	64 Kbps	None	IA-5	
Phnom Penh/VDPP	S	SAT/d	64 Kbps	None	IA-5	

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Paro/VQPR	S	SAT/a	900 baud	None	ITA-2	Plan to upgrade to 64 Kbps 2017 LDD/d using IA5 X.25
ROME/LIII	M	LDD/d	64 Kbps	X.25	IA-5	
Singapore/WSSS	M	LDD/d	64 Kbps	X.25	IA-5	
Vientiane/VLVT	S	SAT/d	32 Kbps	None	IA-5	
Yangon/VYYY	S	SAT/d	48 Kbps	None	IA-5	
<b>TIMOR LESTE</b>						
<b>Dili/WPDL</b>						
Brisbane/YABB	S	LDD/d	N/A	HTTP	IA-5	Internet
<b>TONGA</b>						
<b>Tongatapu-S/NFTF</b>						
Christchurch/NZCH	S	LDD/d	2400 bps	X.25	IA-5	
<b>TUVALU</b>						
<b>Funafuti-S/NGFU</b>						
Nadi/NFFN	S	SAT/d	Internet	IP	IA-5	VPN over Internet

Table II-1

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
United States/KSLC	M	LDD/d	64 Kbps	X.25	IA-5	MPLS/VPN AMHS/IPS 2017
<b>UNITED STATES</b>						
<b>USA-M/KSLC</b>						
Brisbane/YBBB	M	LDD/d	64 Kbps	X.25	IA-5	MPLS/VPN AMHS/IPS 2017
Christchurch/NZCH	S	LDD/d	9600 bps	X.25	IA-5	
Chuuk/PTKK	S	Internet	64 Kbps	IP	IA-5	
Koror/PTRO	S	Internet	64 Kbps	IP	IA-5	
Kosrae/PTSA	S	Internet	64 Kbps	IP	IA-5	
MajuroPKMJ	S	Internet	64 Kbps	IP	IA-5	
Nadi/NFFN	M	LDD/d	9.6 Kbps	X.25	IA-5	
Pago Pago/NSTU	S	SAT/d	2400 bps	IP	IA-5	
Ponapei/PTPN	S	Internet	64 Kbps	IP	IA-5	
Fukuoka/RJJJ	M	LDD/d	64 Kbps	X.25		
YapPTYA	S	Internet	64 Kbps	IP	IA-5	
<b>VANUATU</b>						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
<b>Port Vila-S/NVVV</b>						
Brisbane/YBBB	S	LDD/d	N/A	HTTP	IA-5	Internet
<b>VIET NAM</b>						
<b>Hanoi-S/VVNB</b>						
Vientiane/VLVT	S	SAT/d	2400 bps	None	IA-5	
Ho Chi Minh/VVTS	S	SAT/d	9600 bps	None	IA-5	
Guangzhou/ZGGG	S	SAT/d	300 bps	None	IA-5	
<b>Ho Chi Minh-S/VVTS</b>						
Bangkok/VTBB	S	SAT/d	2400 bps	None	IA-5	
Hanoi/VVNB		SAT/d	9600 bps	None	IA-5	
Hong Kong/VHHH	S	LDD/d	2400 bps	None	IA-5	
Singapore/WSSS	S	LDD/d	128 Kbps	X.25	IA-5	
<b>WALLIS IS/ (FRANCE)</b>						
<b>Wallis-S/NLWW</b>						

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
Nadi/NFFN	S	SAT/d	9600 bps	IP	IA-5	Via Noumea

## TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

### EXPLANATION OF THE TABLE

#### *Column*

- 1 Name of the Administration and Location of the ATN Router
- 2 Type of Router (in end systems (ES) of the Administration shown in column 1)
- 3 Type of Interconnection:  
Inter-Regional: Connection between different Regions/ domains  
Intra-Regional: Connection within a Region/ domain.
- 4 Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1)
- 5 Bandwidth: Link Speed expressed in bits per second (bps)
- 6 Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)
- 7 Via: The media used to implement the interconnection of the routers. (in case of IP service bought from a service provider, indicate VPN)  
DDN (public telecomm leased line)  
VSAT  
VPN
- 8 Remarks



Table CNS II-2 - Required ATN Infrastructure Routing Plan

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Afghanistan Kabul	BIS	Intra-Regional	Pakistan	64000bps	IPS		Intra-domain
	BIS	Inter-Regional	Iran	9600 bps	IPS		
American Samoa Pago Pago			United States				Intra-domain
Australia Brisbane	BBIS	Intra-Regional	Fiji	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000 bps	IPS		Not implemented
	BBIS	Intra-Regional	Japan	64000 bps	IPS/IP-SNDCF	VPN	Not implemented
	BIS	Intra-Regional	New Zealand	64000 bps	IPS	VPN	Not implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	South Africa	64000 bps	TBD		Not implemented
	BBIS	Inter-Regional	United States	64000 bps	DDN lease line/IPS		
Bangladesh Dhaka	BIS	Intra-Regional	India	64000 bps	IPS		Implemented
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Bhutan Paro	BIS	Intra-Regional	India	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
Brunei Darussalam Brunei	BIS	Intra-Regional	Malaysia	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
Cambodia Phnom Penh	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
China Beijing	BIS	Intra-Regional	DPR Korea	9600 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Router Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	VPN	Implement from 2016 onwards
	BBIS	Inter-Regional	Kuwait	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Mongolia	9600 bps	X.25		Router Implemented
	BIS	Intra-Regional	Myanmar	64000 bps	IPS		Implementation on going/Plan Q4/15
	BIS	Intra-Regional	Nepal	9600 bps	X.25		Router Implemented
	BIS	Intra-Regional	Pakistan	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Republic of Korea	64000 bps	X.25		Implemented
	BBIS	Inter-Regional	Russian Federation	64000 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	
	BIS	Intra-Regional	Vietnam	9600 bps	X.25		
Taipei	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD
	BIS	Intra-Regional	Japan	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
Hong Kong, China	BBIS	Intra-Regional	China	64000 bps	X.25	DDN	Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25	DDN	Implemented
	BBIS	Intra-Regional	Japan	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BIS	Intra-Regional	Philippines	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BBIS	Intra-Regional	Taipei	64000 bps	X.25	DDN	TBD

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	X.25	DDN	TBD
Macau, China	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Implemented
Cook Islands Rarotonga			New Zealand	796 kbps	IPS		Intra-domain
DPR Korea Pyongyang	BIS	Intra-Regional	China	9600 bps	X.25		
Fiji Nadi	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Kiribati	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
	BIS	Intra-Regional	New Caledonia	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
	BIS	Intra-Regional	Tuvalu	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
	BBIS	Inter-Regional	United States	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BIS	Intra-Regional	Wallis Islands	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016
French Polynesia Papeete			New Zealand	64000 bps	IPS		Intra-domain
India Mumbai	BIS	Intra-Regional	Bangladesh	64000 bps	DDN leased line/IPS		Implemented
	BIS	Intra-Regional	Bhutan	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
	BBIS	Intra-Regional	China	64000 bps	X. 25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BIS	Inter-Regional	Kenya	64000 bps	TBD	TBD	Presently using AFTN via VPN via public internet

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Nepal	64000 bps	IPS		Implemented
	BIS	Inter-Regional	Oman	64000 bps	IPS		IOT completed. POT planned. TMC to be signed
	BIS	Intra-Regional	Pakistan	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BBIS	Intra-Regional	Singapore	64000 bps	X.25	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPS	DDN	IOT/POT Ccompleted.
	BBIS	Intra-Regional	Thailand	64000 bps	X. 25	DDN	Implemented
	BBIS	Intra-Regional	Nairobi	64000 bps	IPS		
<b>Indonesia</b> Jakarta	BIS	Intra-Regional	Australia	64000bps	IPS		Not Implemented
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan Q1/16
<b>Japan</b> Tokyo	BBIS	Intra-Regional	Australia	64000 bps	IPS/IP-SNDCF	VPN	Schedule after CRV
	BBIS	Intra-Regional	China	64000 bps	IPS/IP-SNDCF	VPN	Implement from 2016 onwards Schedule after CRV
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	DDN/ VPN	TBD
	BIS	Intra-Regional	Republic of Korea	64000 bps	IPS(IPv4)	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	Russia Federation	64000 bps	IP-SNDCF	DDN/ VPN	TBD
	BBIS	Intra-Regional	Singapore	64000 bps	IPS/SNDCF	DDN	Scheduled for Q1/2018
	BIS	Intra-Regional	Taipei	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	United States	64000 bps	X.25-SNDCF	DDN/ VPN	Implemented

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Kiribati Tarawa Lao PDR Vientiane	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25		
Malaysia Kuala Lumpur	BIS	Intra-Regional	Brunei	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented
Maldives Male	BIS	Intra-Regional	Sri Lanka	64000 bps	X.25		
Marshall Islands Majuro	BIS	Inter-Regional	United States	64000 bps	IP		VPN over Internet Intro-domain
Micronesia Federated State of  Chuuk	BIS	Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet  Intra-domain
Kosrae		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Ponapei		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Yap		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Mongolia Ulanbaatar	BIS	Intra-Regional	China	9600 bps	X.25		Router Implemented
Myanmar Yangon	BIS	Intra-Regional	China	64000 bps	IPS		
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Nepal Kathmandu	BIS	Intra-Regional	China	9600bps	X.25		Router Implemented
	BIS	Intra-Regional	India	64000 bps	IPS		Implemented

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
New Caledonia Noumea			Fiji	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
New Zealand Christchurch	BIS	Intra-Regional	Australia	64000 bps	IPS	VPN	Not Implemented
			Cook Is.	796 kbps	IPS		Intra-domain
			French Polynesia	64000 bps	IPS		Intra-domain
			Samoa	1.1 Mb	IPS		Intra-domain
			Tonga	85000 bps	IPS		Intra-domain
	BIS	Inter-Regional	USA	64000 bps	IPS		
Pakistan Karachi	BIS	Intra-Regional	Afghanistan	64000 bps	IPS		
	BIS	Intra-Regional	China	64000 bps	X.25		
	BIS	Intra-Regional	India	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BIS	Inter-Regional	Oman	64000 bps	-		
	BIS	Inter-Regional	Iran	64000 bps	-		
	BIS	Inter-Regional	Kuwait	64000 bps	-		
Philippines	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	2016
		Intra-Regional	United States	64000 bps	IPS		to be implemented in 2016
Republic of Korea Seoul	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Japan	64000 bps	IPS(IPv4)	VPN	Implementation from 2016 onwards scheduled after CRV
Samoa Faleolo			New Zealand	1.1 Mb	IPS		Intra-domain

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Singapore Singapore	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	Bahrain	64000 bps	IPv4	DDN	
	BIS	Intra-Regional	Brunei	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan Q1/16
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	DDN	ATN/AMHS trial commence on 2017 Scheduled for Q1/2018
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Philippines	64000 bps	IPv4	DDN	2016
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPv4	DDN	Implementation Plan Q1/16
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Inter-Regional	United Kingdom	128000 bps	IPv4	VPN	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
Sri Lanka Colombo	BIS	Intra-Regional	India	64000 bps	IPS	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Maldives	64000 bps	X.25		TBD
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	Implementation Plan Q1/16
Thailand Bangkok	BIS	Intra-Regional	Bangladesh	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Cambodia	64000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	China	64000 bps	CLNP/X.25	DDN	
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BBIS	Inter-Regional	Italy	64000 bps	IPv4	DDN	
	BIS	Intra-Regional	Lao PDR.	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Myanmar	32000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	IPv4	VSAT	
<b>Tonga</b> Tongatapu	BIS	Intra-Regional	New Zealand	85000 bps	IPS		Intra-domain
<b>Tuvalu</b> Faleolo	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
<b>United States</b> Salt Lake City	BBIS	Inter-Regional	Australia	64000 bps	IPS		
			American Samoa				Intra-domain
	BBIS	Inter-Regional	Fiji	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BBIS	Inter-Regional	Japan	64000 bps	X.25-SNDCF	DDN/ VPN	Implemented
		Intra-Regional	Marshall Islands	64000 bps	IP		Intra-domain/Internet
		Intra-Regional	Micronesia, Federated State of	64000 bps	IP		Intra-domain
	BIS	Inter-Regional	New Zealand	64000 bps	IPS		Implemented
		Intra-Regional	Philippines	64000 bps	IP		to be implementated in 2016
<b>Viet Nam</b> Ho Chi Minh/Hanoi	BIS	Intra-Regional	China	9600 bps	X.25		
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD



Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Lao PDR.	9600 bps	X.25		
	BIS	Intra-Regional	Singapore	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	
Wallis Islands	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016

Updated: JUN 2015

## TABLE CNS III-3 - ATS DIRECT SPEECH CIRCUITS PLAN

### EXPLANATION OF THE TABLE

#### *Column*

1 and 2	Circuit terminal stations are listed alphabetically by the Terminal I.
3	A — indicates ATS requirement for the establishment of voice communication within 15 seconds D — indicates requirements for instantaneous communications
4	Type of service specified:  LTF — landline telephone (landline, cable, UHF, VHF, satellite) RTF — radiotelephone
5	Type of circuits; Direct (DIR) or Switched (SW) DIR — indicates a direct circuit connecting Terminals I and II. SW — indicates that a direct circuit does not exist and that the connection is established via switching at the switching centre(s) indicated in column 6. IDD — International direct dialling by public switch telephone network
6	Location of switching centre(s).
7	Remarks

*Note 1.— Number of D and/or S circuits between Terminals I and II are indicated by numerical prefix, i.e. 2 D/S means 2 direct circuits and one switched circuit.*

*Note 2.— Pending the implementation of proper ATS voice circuits, and provided that aeronautical operational requirements are met, IDD services may be used for the ATS voice communications in low traffic areas.*

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**TABLE CNE II-3 REQUIRED ATN INFRASTRUCTURE ROUTING PLAN**

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
<b>AFGHANSITAN</b>						
KABUL ACC	KARACHI	A	LTF	DIR		
	LAHORE	A	LTF	DIR		
<b>AMERICAN SAMOA (United States)</b>						
PAGO PAGO APP	ALOFI	A	LTF	DIR		
	APIA/FALEOLO	A	LTF	DIR		
	NADI	A	LTF	DIR		
<b>AUSTRALIA</b>						
BRISBANE ACC	AUCKLAND	A	LTF	DIR		
	BALI	A	LTF	DIR		
	HONIARA	A	LTF	DIR		
	JAKARTA	A	LTF	DIR		
	NADI	A	LTF	SW	OAKLAND	
	OAKLAND	A	LTF	DIR		
	PORT MORESBY	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
MELBOURNE	BRISBANE	A	LTF	DIR	NETWORK OPERATION	
	COLOMBO	A	LTF	DIR		
	DIEGO GARCIA	A	LTF	DIR		
	JAKARTA	A	LTF	SW	BRISBANE	
	JOHANNESBERG	A	LTF	DIR		
	MALE	A	LTF	DIR		
	MAURITIUS	A	LTF	DIR		
	JAKATA ACC	A	LTF	DIR		
	BRISBANE	X	LTF	DIR		
PERTH APP	JAKATA ACC	A	LTF	DIR		
<b>BANGLADESH</b>						
DHAKA ACC	AGARTALA	A	LTF	IDD		
	KOLKATA	A	LTF	DIR		
	GUWAHATI	A	LTF			
	YANGON	A	LTF	SW	BANGKOK	
<b>BRUNEI DARUSSALAM</b>						
BRUNEI ACC	KOTA KINABALU	A	LTF	DIR		
	LABUAN	A	LTF	DIR		
	LIMBANG	A	LTF	DIR		
	MIRI	A	LTF	DIR		
<b>CAMBODIA</b>						
PHNOM PENH ACC	BANGKOK	A	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	VIENTIANE	A	LTF	SW	BANGKOK	
<b>CHINA</b>						
BEIJING ACC	DALIAN	A	LTF	DIR		
	HOHHOT	A	LTF	DIR		
	JINAN	A	LTF	DIR		
	SHENYANG	A	LTF	DIR		
	TAIYUAN	A	LTF	DIR		
	ULAANBAATAR	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
	GUANGZHOU	A	LTF	DIR		
	GUILIN	A	LTF	DIR		
	GUIYANG	A	LTF	DIR		
	WUHAN	A	LTF	DIR		
	NANCHANG	A	LTF	DIR		
CHENGDU ACC	GUIYANG	A	LTF	DIR		
	KUNMING	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		
	LHASA	A	LTF	DIR		
	WUHAN	A	LTF	DIR		
	XI'AN	A	LTF	DIR		
DALIAN ACC	BEIJING	A	LTF	DIR		
	PYONGYANG	A	LTF	DIR		
	QINGDAO	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
	SHENYANG	A	LTF	DIR		
GUANGZHOU ACC	CHANGSHA	A	LTF	DIR		
	GUILIN	A	LTF	DIR		
	HAIKOU	A	LTF	DIR		
	HONG KONG	D	LTF	DIR		
	MACAO	A	LTF	DIR		
	NANCHANG	A	LTF	DIR		
	NANNING	A	LTF	DIR		
	SANYA	A	LTF	DIR		
	TAIBEI	A	LTF	DIR		
	XIAMEN	A	LTF	DIR		
GUILIN ACC	CHANGSHA	A	LTF	DIR		
	GUANGZHOU	A	LTF	DIR		
	GUIYANG	A	LTF	DIR		
	NANNING	A	LTF	DIR		
GUIYANG ACC	CHANGSHA	A	LTF	DIR		
	CHENGDU	A	LTF	DIR		
	GUILIN	A	LTF	DIR		
	KUNMING	A	LTF	DIR		
	NANNING	A	LTF	DIR		
HAIKOU ACC	GUANGZHOU	A	LTF	DIR		
	HA NOI	A	LTF	DIR		
	HONG KONG	A	LTF	DIR		
	NANNING	A	LTF	DIR		
	SANYA	A	LTF	DIR		
HAILAR ACC	CHITA	A	LTF	DIR		
	HARBIN	A	LTF	DIR		
	SHENYANG	A	LTF	DIR		
HARBIN ACC	KHABAROVSK	A	LTF	DIR		
	HAILAR	A	LTF	DIR		
	SHENYANG	A	LTF	DIR		
	VLADIVOSTOK	A	LTF	DIR		

Table II-3

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
HEFEI ACC	JINAN	A	LTF	DIR		
	NANCHANG	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		
	WUHAN	A	LTF	DIR		
HOHHOT ACC	BEIJING	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		
	TAIYUAN	A	LTF	DIR		
	ULAANBAATAR	A	LTF	DIR		
JINAN ACC	BEIJING	A	LTF	DIR		
	HEFEI	A	LTF	DIR		
	QINGDAO	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		
KUNMING ACC	CHENGDU	A	LTF	DIR		
	GUIYANG	A	LTF	DIR		
	HANOI	A	LTF	DIR		
	NANNING	A	LTF	DIR		
	YANGON	A	LTF	SW	BANGKOK	
LANZHOU ACC	CHENGDU	A	LTF	DIR		
	HOHHOT	A	LTF	DIR		
	LHASA	A	LTF	DIR		
	ULAANBAATAR	A	LTF	DIR		
	XI'AN	A	LTF	DIR		
LHASA	CHENGDU	A	LTF	DIR		
	KATHMANDU	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		
	URUMQI	A	LTF	DIR		
NANCHANG ACC	CHANGSHA	A	LTF	DIR		
	GUANGZHOU	A	LTF	DIR		
	HEFEI	A	LTF	DIR		
	WUHAN	A	LTF	DIR		
	XIAMEN	A	LTF	DIR		
NANNING	GUANGZHOU	A	LTF	DIR		
	GUILIN	A	LTF	DIR		
	GUIYANG	A	LTF	DIR		
	HAIKOU	A	LTF	DIR		
	KUNMING	A	LTF	DIR		
QINGDAO ACC	DALIAN	A	LTF	DIR		
	JINAN	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
SANYA ACC	GUANGZHOU	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
	HAIKOU	A	LTF	DIR		
	HA NOI	A	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	HONG KONG	A	LTF	DIR		
	MANILA	A	LTF	DIR		
SHANGHAI ACC	FUKUOKA	A	LTF	DIR		
	HEFEI	A	LTF	DIR		
	JINAN	A	LTF	DIR		
	NAHA	A	LTF	DIR		
SHENYANG ACC	BEIJING	A	LTF	DIR		
	DALIAN	A	LTF	DIR		
	HAILAR	A	LTF	DIR		
	HARBIN	A	LTF	DIR		
	PYONGYANG	A	LTF	DIR		
	VLADIVOSTOK	A	LTF	DIR		
SHENZHEN	MACAO	A	LTF	DIR		
TAIBEI ACC	GUANGZHOU	A	LTF	DIR		
	HONG KONG	D	LTF	DIR		
	MANILA	A	LTF	DIR		
	NAHA	D	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
	XIAMEN	A	LTF	DIR		
TAIYUAN ACC	BEIJING	A	LTF	DIR		
	HOHHOT	A	LTF	DIR		
	JINAN	A	LTF	DIR		
	XI'AN	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		
URUMQI ACC	ALMA-ATA	A	RTF	DIR		
	BARNUAL	A	RTF	DIR		
	BISHEKEK	A	RTF	DIR		
	KHOVD	A	RTF	DIR		
	LAHORE	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		
	RAWALPIND	A	LTF	DIR		
	ULAANBAATAR	A	LTF	DIR		
WUHAN ACC	CHANGSHA	A	LTF	DIR		
	CHENGDU	A	LTF	DIR		
	HEFEI	A	LTF	DIR		
	NANCHANG	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		
XIAMEN ACC	GUANGZHOU	A	LTF	DIR		
	NANCHANG	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	TAIBEI	A	LTF	DIR		
XI'AN ACC	CHENGDU	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		

Table II-3

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
	TAIYUAN	A	LTF	DIR		
	ZHENGZHOU	A	LTF	DIR		
ZHANJIANG	HONG KONG	A	LTF	DIR		
ZHENGZHOU ACC	BEIJING	A	LTF	DIR		
	JINAN	A	LTF	DIR		
	TAIYUAN	A	LTF	DIR		
	WUHAN	A	LTF	DIR		
	XI'AN	A	LTF	DIR		
ZHUHAI APP	HONG KONG	A	LTF	DIR		
	MACAO	A	LTF	DIR		
<b>HONG KONG, China</b>						
HONG KONG ACC	GUANGZHOU	D	LTF	DIR		
	MACAO	D	LTF	DIR		
	MANILA	A	LTF	DIR		
	SANYA	A	LTF	DIR		
	SHANTOU	A	LTF	DIR		
	ZHANJIANG	A	LTF	DIR		
	TAIBEI	D	LTF	DIR		
	ZHUHAI	A	LTF	DIR		
<b>MACAO, China</b>						
MACAO TOWER	SHENZHEN	A	LTF	DIR		
	HONG KONG	D	LTF	DIR		
	ZHUHAI	A	LTF	DIR		
<b>COOK IS.</b>						
RAROTONGA	AUCKLAND	A	LTF	DIR		
	TAHITI/PAPEETE	A	LTF	DIR		
<b>DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA</b>						
PYONGYANG ACC	DALIAN	A	LTF	DIR		
	SHENYANG	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
	VLADIVOSTOK	A	LTF	DIR		
<b>Fiji</b>						
NADI ACC	ALOFI	A	LTF	DIR		
	APIA	A	LTF	DIR		
	AUCKLAND	A	LTF	DIR		
	BRISBANE	A	LTF	SW	AUCKLAND	
	HONIARA	A	LTF	SW	SYDNEY	
	NOUMEA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	PAGO PAGO	A	LTF	DIR		
	PORT VILA	A	LTF	DIR		
	VAVA'U	A	LTF	DIR		
	WALLIS	A	LTF	DIR		Via IDD
<b>FRENCH POLYNESIA (France)</b>						
TAHITI/PAPEETE ACC	AUCKLAND	A	LTF	IDD		
	ISLA DE PASCUA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	RAROTONGA	A	LTF	DIR		
<b>GUAM (United States)</b>						
GUAM I.	MOEN	A	LTF	DIR		
	YAP	A	LTF	DIR		
<b>INDIA</b>						

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
AGARTALA APP	KOLKATA	A	LTF	DIR		
	DHAKA	A	LTF	IDD		
AHMEDABAD APP	MUMBAI	A	LTF	DIR		
	KARACHI	A	LTF	DIR	MUMBAI	D/S
AMRITSAR APP	DELHI	A	LTF	DIR		
	LAHORE	A	LTF	DIR		
KOLKATA ACC	AGARTALA	A	LTF	DIR		
	MUMBAI	A	LTF	DIR		
	DHAKA	A	LTF	DIR		
	DELHI	A	LTF	DIR		
	GUWAHATI	A	LTF	DIR		
	KATHMANDU	A	LTF	DIR		
	CHENNAI	A	LTF	DIR		
	NAGPUR	A	LTF	DIR		
	VARANASI	A	LTF	DIR		
YANGON	A	LTF	DIR			
CHENNAI ACC	MUMBAI	A	LTF	DIR		
	KOLKATA	A	LTF	DIR		
	COLOMBO	A	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	TIRUCHCHIRAPPALLI	A	LTF	DIR		
DELHI ACC	AMRITSAR	A	LTF	DIR		
	MUMBAI	A	LTF	DIR		
	KOLKATA	A	LTF	DIR		
	KARACHI	A	LTF	DIR		D/S
	KATHMANDU	A	LTF	IDD		
GUWAHATI	LAHORE	A	LTF	DIR		
	VARANASI	A	LTF	DIR		2D
MUMBAI ACC	KOLKATA		LTF	DIR		
	DHAKA		LTF	IDD		
MUMBAI ACC	AHMEDABAD	A	LTF	DIR		
	KOLKATA	A	LTF	DIR		
	DELHI	A	LTF	DIR		
	KARACHI	A	LTF	DIR		2D
	CHENNAI	A	LTF	DIR		
	MALE	A	LTF	IDD		
	MAURITIUS	A	LTF	IDD		
	MOGADISHU	A	LTF	IDD		
	MUSCAT/SEEB	A	LTF	DIR		
	NAGPUR	A	LTF	DIR		
SEYCHELLES	A	LTF	DIR			
NAGPUR APP	MUMBAI	A	LTF	DIR		
	KOLKATA	A	LTF	DIR		



ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
TIRUCHCHIRAPPALLI APP	CHENNAI	A	LTF	DIR		
TRIVANDRUM ACC	CALICUT	A	LTF	DIR		
	COLOMBO	A	LTF	IDD		
	CHENNAI	A	LTF	DIR		
	MALE	A	LTF	DIR		
VARANASI ACC	KOLKATA	A	LTF	DIR		
	DELHI	A	LTF	DIR		
	KATHMANDU	A	LTF	DIR		
<b>INDONESIA</b>						
BALI ACC	BRISBANE	A	LTF	DIR		
	JAKARTA	A	LTF	DIR		
	KUPANG	A	LTF	DIR		
	MANADO	A	LTF	DIR		
	SURABAYA	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
BATAM TWR	JAKARTA	A	LTF	DIR		
	SINGAPORE	D	LTF	DIR		
	TANJUNG PINANG	D	LTF	DIR		
BIAK APP	DARWIN	A	LTF	DIR		
	JAYAPURA	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
JAKARTA ACC	BALI	A	LTF	DIR		
	BATAM	A	LTF	DIR		
	KOTA KINABALU	A	LTF	SW	SINGAPORE	
	KUALA LUMPUR	A	LTF	SW	SINGAPORE	
	MANILA	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	PADANG	A	LTF	DIR		
	PEKAN BARU	X	LTF	DIR		
	PERTH	A	LTF	DIR		
	PONTIANAK	A	LTF	DIR		
	RANAI	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
	SYDNEY	X	LTF	DIR		
	TANJUNG PINANG	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
JAYAPURA APP	BIAK	A	LTF	DIR		
	PORT MORESBY	A	LTF	DIR		
	VANIMO	A	LTF	DIR		
KUPANG APP	BALI	A	LTF	DIR		
	DARWIN	A	LTF	DIR		
MANADO	BALI	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
MEDAN ACC	COLOMBO	A	LTF	DIR		
	JAKARTA	A	LTF	DIR		

Table II-3

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
	KUALA LUMPUR	A	LTF	DIR		
	CHENNAI	A	LTF	DIR		
	PADANG	A	LTF	DIR		
	SINGAPORE	A	LTF	SW	JAKARTA	
PADANG	JAKARTA	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	PEKAN BARU	A	LTF	DIR		
PEKAN BARU APP	JAKARTA	X	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
	MALACCA	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
PONTIANAK TWR	JAKARTA	A	LTF	DIR		
	KUCHING	A	RTF	DIR		
	RANAI	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
	TANJUNG PINANG	A	LTF	DIR		
RANAI	JAKARTA	A	LTF	DIR		
	KUCHING	A	LTF	DIR		
	PONTIANAK	A	LTF	DIR		
SURABAYA	BALI	A	LTF	DIR		
TANJUNG PINANG	BATAM	D	LTF	DIR		
	JAKARTA	A	LTF	DIR		
	PONTIANAK	A	LTF	DIR		
	SINGAPORE	D	LTF	DIR		
UJUNG PANDANG	BALI	D	LTF	DIR		
	BIAK	A	LTF	DIR		
	BRISBANE	A	LTF	DIR		
	JAKARTA	A	LTF	DIR		
	KOTA KINBALU	A	LTF	DIR		
	MANADO	A	LTF	DIR		
	MANILA	A	LTF	SW	JAKARTA	
	PORT MORESBY	A	LTF	SW	JAKARTA, SYDNEY	
	OAKLAND	A	LTF	DIR		
<b>JAPAN</b>						
FUKUOKA ACC	INCHEON	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
NAHA ACC	MANILA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
	TAIBEI	A	LTF	DIR		
SAPPORO ACC	KHABAROVSK	D	LTF	DIR		
	VLADIVOSTOK	A	LTF	DIR		
	YUZHNO SAKHALINSK	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
TOKYO ACC	ANCHORAGE	A	LTF	SW		
	ANCHORAGE	D	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	INCHEON	A	LTF	DIR		
<b>JOHNSTON I. (United States)</b>						
JOHNSTON I. TWR	OAKLAND	A	LTF	DIR		
<b>KIRIBATI</b>						
TARAWA	OAKLAND	A	LTF	DIR		
KIRITIMATI I.	OAKLAND	A	LTF	DIR		
<b>LAO PEOPLE'S DEMOCRATIC REPUBLIC</b>						
VIENTIANE FIC	BANGKOK	A	LTF	DIR		
	HA NOI	A	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	KUNMING	A	LTF	DIR		
	PHNOM PENH	A	LTF	SW	BANGKOK	
	YANGON	A	LTF	SW	BANGKOK	
<b>MALAYSIA</b>						
JOHOR BAHRU APP	SINGAPORE	D	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
KOTA KINABALU ACC	BRUNEI	A	LTF	DIR		
	JAKARTA	A	LTF	SW	SINGAPORE	
	KUALA LUMPUR	A	LTF	DIR		
	KUCHING	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	MIRI	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
	TAWAU	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
KUALA LUMPUR ACC	BANGKOK	A	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	JAKARTA	A	LTF	SW	SINGAPORE	
	JOHOR BAHRU	A	LTF	DIR		
	KUANTAN	A	LTF	DIR		
	KOTA KINABALU	A	LTF	DIR		
	CHENNAI	A	LTF	DIR		
	MALACCA	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	PEKAN BARU	A	LTF	DIR		
	SINGAPORE	D	LTF	DIR		
KUANTAN APP	SINGAPORE	A	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
KUCHING APP	KOTA KINABALU	A	LTF	DIR		
	PONTIANAK	A	LTF	DIR		
	RANAI	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
LABUAN	BRUNEI	A	LTF	DIR		
LIMBANG	BRUNEI	A	LTF	DIR		
MALACCA APP	KUALA LUMPUR	A	LTF	DIR		
	PEKAN BARU	A	LTF	DIR		

Table II-3

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
MIRI	BRUNEI	A	LTF	DIR		
	KOTA KINABALU	D	LTF	DIR		
TAWAU APP	KOTA KINABALU	A	LTF	DIR		
<b>MALDIVES</b>						
MALE FIC	COLOMBO	A	LTF	IDD		
	MUMBAI	A	LTF	IDD		
	CHENNAI	A	LTF	IDD		
	MAURITIUS	A	LTF	IDD		
	MELBOURNE	A	LTF	IDD		
	TRIVANDRUM	A	LTF	IDD		
<b>MARSHALL IS.</b>						
MAJURO APP	OAKLAND	A	LTF	DIR		
KWAJALEIN APP	OAKLAND	A	LTF	DIR		
<b>MICRONESIA, FEDERATED STATES OF</b>						
KOSRAE APP	OAKLAND	A	LTF	DIR		
MOEN APP	GUAM I.	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
POHNPEI APP	OAKLAND	A	LTF	DIR		
YAP APP	GUAM I.	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
<b>MONGOLIA</b>						
ULAANBAATAR ACC	ABAKAN	A	LTF	DIR		
	BARNAUL	A	LTF	DIR		
	BEIJING	A	LTF	DIR		
	HUHHOT	A	LTF	DIR		
	IRKUTSK	A	LTF	DIR		
	KYZYL	A	LTF	DIR		
	LANZHOU	A	LTF	DIR		
	MUREN	A	LTF	DIR		
	URUMQI	A	LTF	DIR		
<b>MYANMAR</b>						
YANGON ACC	BANGKOK	A	LTF	DIR		
	KOLKATA	A	LTF	DIR		
	DHAKA	A	LTF	SW	BANGKOK	
	KUNMING	A	LTF	SW	BANGKOK	
	CHENNAI	A	LTF	IDD		
	VIENTIANE	A	LTF	SW	BANGKOK	
<b>NAURU</b>						
NAURU FIC	HONIARA	A	LTF	SW	SYDNEY	
	NADI	A	LTF	DIR		
	PORT MORESBY	A	LTF	SW	SYDNEY	
<b>NEPAL</b>						
KATHMANDU	KOLKATA	A	LTF	DIR		
	DELHI	A	LTF	IDD		
	LASHA	A	LTF	DIR		
	VARANASI	A	LTF	DIR		
<b>NEW CALEDONIA (France)</b>						
NOUMEA/LA TONTOUTA APP	HONIARA	A	LTF	SW	SYDNEY, NADI	
	NADI	A	LTF	DIR		
	PORT VILA	A	LTF	SW	NADI	

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
<b>NEW ZEALAND</b>						
AUCKLAND	ALOFI	A	LTF	IDD		
	CHRISTCHURCH	A	LTF	DIR		
	ISLA DE PASCUA	A	LTF	IDD		
	NADI	A	LTF	DIR		
	OAKLAND	A	LTF	IDD		
	RAROTONGA	A	LTF	IDD		
	BRISBANE	A	LTF	DIR		
	TAHITI/PAPEETE	A	LTF	IDD		
<b>NIUE (New Zealand)</b>						
ALOFI APP	AUCKLAND	A	LTF	IDD		
	NADI	A	LTF	DIR		
	PAGO PAGO	A	LTF	DIR		
<b>NORTHERN MARIANA IS. (United States)</b>						
SAIPAN APP	OAKLAND	A	LTF	DIR		
<b>PAKISTAN</b>						
KARACHI ACC	AHMEDABAD	A	LTF	SW	MUMBAI	D/S
	MUMBAI	A	LTF	DIR		2D
	DELHI	A	LTF	DIR		D/S
	KABUL	A	LTF	DIR		
	MUSCAT	A	LTF	DIR		2D
	TEHRAN	A	LTF	DIR		2D
LAHORE ACC	AMRITSAR	A	LTF	DIR		
	DELHI	A	LTF	DIR		2D
	DUSHANBE	A	LTF	DIR		(Planned)
	KABUL	A	LTF	DIR		
	URUMQI	A	LTF	DIR		
<b>PAPUA NEW GUINEA</b>						
PORT MORESBY ACC	BRISBANE	A	LTF	DIR		
	CAIRNS	A	LTF	DIR		
	HONIARA	A	LTF	DIR		
	JAYAPURA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	SW	SYDNEY, JAKARTA	
<b>PHILIPPINES</b>						
DAVAO APP	MACTAN	A	LTF	DIR		
	MANILA					NC
LAOAG APP	MANILA	A	LTF	DIR		
MACTAN APP	DAVAO	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	ZAMBOANGA	A	LTF	DIR		
	TAGBILARAN TOWER	A	LTF	DIR		
MACTAN ACC	BACOLOD APP	A	LTF	DIR		
	LAGUINDINGAN APP	A	LTF	DIR		
BACOLOD APP	ILOILO TOWER	A	LTF	DIR		
KALIBO APP	ROXAS TOWER	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	CATICLAN TOWER	A	LTF	DIR		
MANILA ACC	BIAK					NC
	DAVAO					NC
	HO CHI MINH	A	LTF	DIR		
	HONG KONG	A	LTF	DIR		
	KOTA KINABALU	A	LTF	DIR		
	JAKARTA					NC
	LAOAG	A	LTF	DIR		
	MACTAN	A	LTF	DIR		
	NAHA	A	LTF	DIR		
	FUKUOKA	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	SANYA	A	LTF	IDD		
	SINGAPORE	A	LTF	DIR		
	SUBIC BAY	A	LTF	DIR		
	TAIBEI	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
	CLARK	A	LTF	DIR		
	LEGASPI	A	LTF	DIR		
	KALIBO	A	LTF	DIR		
	PUERTO PRINCESA	A	LTF	DIR		
SUBIC BAY APP	MANILA	A	LTF	DIR		
<b>REPUBLIC OF KOREA</b>						
INCHEON ACC	DALIAN	A	LTF	DIR		
	FUKUOKA	D	LTF	DIR		
	PYONGYANG	A	LTF	DIR		
	NAHA	A	LTF	DIR		
	QINGDAO	A	LTF	DIR		
	SHANGHAI	A	LTF	DIR		
	TAIBEI	A	LTF	DIR		
	TOKYO	A	LTF	DIR		
<b>SAMOA</b>						
APIA/FALEOLO	AUCKLAND	A	LTF	DIR		
	PAGO PAGO	A	LTF	DIR		
	NADI	A	LTF	DIR		
	TONGATAPU	A	LTF	DIR		
<b>SINGAPORE</b>						
SINGAPORE ACC	BATAM	D	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	JAKARTA	A	LTF	DIR		
	JOHOR BAHRU	D	LTF	DIR		
	KOTA KINABALU	A	LTF	DIR		
	KUALA LUMPUR	D	LTF	DIR		
	KUANTAN	A	LTF	DIR		
	KUCHING	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	MEDAN	A	LTF	SW	JAKARTA	
	PEKAN BARU	A	LTF	DIR		
	PONTIANAK	A	LTF	DIR		
	TANJUNG PINANG	D	LTF	DIR		
<b>SOLOMON IS.</b>						
HONIARA ACC	BRISBANE	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	
	NADI	A	LTF	SW	SYDNEY	
	NAURU	A	LTF	SW	SYDNEY	
	NOUMEA	A	LTF	SW	SYDNEY, NADI	
	OAKLAND	A	LTF	SW		
	PORT MORESBY	A	LTF	DIR		
<b>SRI LANKA</b>						
COLOMBO ACC	BRISBANE	A	LTF	DIR		
	CHENNAI	A	LTF	DIR		
	MALE	A	LTF	DIR		
	MEDAN	A	LTF	DIR		
	TRIVANDRUM	A	LTF	DIR		
<b>THAILAND</b>						
BANGKOK ACC	HO CHI MINH	A	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
	PHNOM PENH	A	LTF	DIR		
	VIENTIANE	A	LTF	DIR		
	YANGON	A	LTF	DIR		
<b>TONGA</b>						
TONGATAFU APP	AUCKLAND	A	LTF	DIR		
	NADI	A	LTF	DIR		
VAVA'U	NADI	A	LTF	DIR		
<b>TUVALU</b>						
FUNAFUTI APP	NADI					
<b>UNITED STATES</b>						
ANCHORAGE ACC	ANADYR	A	LTF	DIR		
	MAGADAN	A	LTF	DIR		
	OAKLAND	A	LTF	DIR		
	TOKYO	A	LTF	SW	OAKLAND	
	TOKYO	D	LTF	DIR		
	VANCOUVER	A	LTF	DIR		
	PETROPAVLOVSK -KAMCHATSKY	A	LTF	DIR		
	VANCOUVER	D	LTF	DIR		
OAKLAND	AUCKLAND	A	LTF	IDD		
	BIAK	A	LTF	DIR		
	BRISBANE	A	LTF	DIR		
	KIRITIMATI I. TWR	A	LTF	DIR		
	GUAM I.	A	LTF	DIR		
	HONIARA	A	LTF	DIR		
	JOHNSTON I. TWR	A	LTF	DIR		
	KOROR	A	LTF	DIR		
	KOSRAE	A	LTF	DIR		
	KAWJALEIN	A	LTF	DIR		
	MAJURO ATOLL	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	MOEN	A	LTF	DIR		
	NADI	A	LTF	DIR		
	NAHA	A	LTF	DIR		
	NAURU	A	LTF	DIR		
	PAGO PAGO APP	A	LTF	DIR		
	POHNPEI	A	LTF	DIR		
	PORT MORESBY	A	LTF	DIR		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	DIR/SW	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	SAIPAN	A	LTF	DIR		
	SAPPORO	A	LTF	DIR		
	TAHITI	A	LTF	DIR		
	TARAWA TWR	A	LTF	DIR		
	TOKYO	A	LTF	DIR		
	UJUNG PANDANG	A	LTF	DIR		
	VANCOUVER	D	LTF	DIR		
	YAP	A	LTF	DIR		
<b>VANUATU</b>						
PORT VILA	NADI	A	LTF	DIR		
	NOUMEA	A	LTF	SW		
<b>VIET NAM</b>						
HA NOI ACC	NANNING	A	LTF	DIR		
	HO CHI MINH	A	LTF	DIR		
	KUNMING	A	LTF	DIR		
	SANYA	A	LTF	DIR		
	VIENTIANE	A	LTF	DIR		
HO CHI MINH ACC	BANGKOK	A	LTF	DIR		
	HA NOI	A	LTF	DIR		
	HONG KONG	A	LTF	DIR		
	KUALA LUMPUR	A	LTF	DIR		
	MANILA	A	LTF	DIR		
	PHNOM PENH	A	LTF	DIR		
	SANYA	A	LTF	DIR		
	SINGAPORE	A	LTF	DIR		
	VIENTIANE	A	LTF	DIR		
<b>WALLIS AND FUTUNA IS. (France)</b>						
WALLIS	NADI	A	LTF	DIR		Via IDD



## TABLE CNS II-4 HF NETWORK DESIGNATORS

### EXPLANATION OF THE TABLE

#### *Column*

- 1 Name of station, preceded by its location indicator.
- 2 Network designators assigned to the facility providing HF radiotelephony en-route aeronautical communications (selected from the provisions of the allotment plan in Appendix S27 to the ITU Radio Regulations).

#### **NOTES**

- *The ICAO designators for HF MWARA and VOLMET networks in the Asia and Pacific regions are derived from the ITU allotment area abbreviations as contained in Appendix S27 to the ITU Radio Regulations. The additionally sectorised sub-networks in accordance with provision 27/21 of the ITU Radio Regulation Appendix 27 were agreed and allocated by ASIA/PAC/3 RAN Meeting and consequential APANPIRG meetings.*

#### *ITU allotment area:*

- *Two- and three-letter alpha entries indicate major world air route areas (MWARA) and Four-letter alpha entries indicate VOLMET areas. Few frequencies selected from RDARA network are also included for en-route aeronautical communication.*

Location Indicator and Name of Location		HF Voice	Remarks
1		2	3
<b>AFGHANISTAN</b>			
OAKB	Kabul	MID 2	
<b>AUSTRALIA</b>			
YBBN	Brisbane	VASIA	
YBBB	Brisbane		
YPXM	Christmas Is	SEA	
YPDN	Darwin	SEA	
YMMM	Melbourne		
YPPM	Perth	SW, NW, INO1 and SEA3	
<b>BANGLADESH</b>			
VGFR	Dhaka		
<b>BHUTAN</b>			
VGFR	PARO/Paro	SEA 1A	
<b>CAMBODIA</b>			
VDPP	Phnom-Penh	SEA 2	
<b>CHINA</b>			
ZBPE	Beijing	NP, EA 1, VASIA	
ZGZU	Guangzhou	EA 1, SEA 1A, VASIA	
ZPKM	Kunming	EA 1, SEA 1A	
ZGSY	Sanya	EA , SEA	
ZSHA	Shanghai	CWP, EA 1, NP	
ZYSH	Shenyang	EA 1	

Location Indicator and Name of Location		HF Voice	Remarks
1		2	3
RCSS	Taipei	CWP	
ZWUQ	Urumqi	MID 2, EA 1	
<b>HONG KONG, CHINA</b>			
VHHK	Hong Kong	CWP, SEA 2, VPAC	
<b>COOK ISLANDS</b>			
NCRG	Avarua/Rorotonga	SP, RDARA 9	
<b>DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA</b>			
ZKKK	Pyongyang	CWP, EA 1, EA 2, NCA 3	
<b>FIJI</b>			
NFFN	Nadi	SP, RDARA 9	
<b>FRENCH POLYNESIA</b>			
NTTT	Tahiti	SP	
<b>INDIA</b>			
VOMF	Chennai	SEA 1B	
VIDF	Delhi	MID 2	
VECF	Kolkata	SEA 1A, VASIA	
VABF	Mumbai (FIC)	MID 2, INO, VASIA	
<b>INDONESIA</b>			
WADZ	Bali	SEA 3	
WIIZ	Jakarta	SEA 3	
WIMZ	Medan	SEA 1B	

Location Indicator and Name of Location		HF Voice	Remarks
1		2	3
WAAZ	Ujungpandang	SEA 3	
<b>JAPAN</b>			
RORG	Naha	CWP	
RJDG	Fukuoka	CWP, NP	
RJTG	Tokyo	CWP, NP, VPAC	
<b>KIRIBATI</b>			
NGTA	Tarawa/Bonriki Int'l.	SP, RDARA 9	
<b>LAO PEOPLE'S DEMOCRATIC REPUBLIC</b>			
VLVT	Vientiane	SEA 2	
<b>MALAYSIA</b>			
WBFC	Johor Bahru	SEA 1	
WMFC	Kuala Lumpur	SEA 1B, SEA 2	
<b>MALDIVES (REPUBLIC OF)</b>			
VRMM	Male		
<b>MONGOLIA</b>			
ZMUB	Ulaan Baatar	NCA 3, EA 1, EA 2	
<b>MYANMAR</b>			
VYYY	Yangon	SEA 1A	
<b>NAURU</b>			
ANAU	Nauru	CWP, RDARA 9	
<b>NEPAL</b>			
VNSM	Kathmandu	SEA 1A, MID 2	
<b>NEW ZEALAND</b>			
NZZO	Auckland	SP, VPAC	

Location Indicator and Name of Location		HF Voice	Remarks
1		2	3
<b>NIUE</b>			
NIUE		RDARA 9	
<b>PAKISTAN</b>			
OPKR	Karachi	MID 2, VASIA	
OPLR	Lahore	MID 2	
<b>PAPUA NEW GUINEA</b>			
AYPY	Port Moresby	CWP	
<b>PHILIPPINES</b>			
RPHI	Manila	CWP, SEA 2	
<b>REPUBLIC OF KOREA</b>			
RKRR	Incheon	NCA 3, CWP	
<b>SAMOA</b>			
NSFA	Faleolo	SP, RDARA 9	
<b>SINGAPORE</b>			
WSJC	Singapore	SEA 2, SEA 3, VASIA	
<b>SOLOMON ISLANDS</b>			
AGGH	Honiara	RDARA 9	
<b>SRI LANKA</b>			
VCCC	Colombo	SEA 1B, INO	
<b>THAILAND</b>			
VTBB	Bangkok	VASIA	
<b>TONGA</b>			
NFTF	Fua'amotu Int'l.	SP, RDARA 9	
<b>TUVALU</b>			
NGFU	Funafuti Int'l.	SP, RDARA 9	

Location Indicator and Name of Location		HF Voice	Remarks
1		2	3
<b>UNITED STATES OF AMERICA</b>			
PHZH	Honolulu	SP, NP, CEP, CWP, VPAC	
<b>VANUATU</b>			
NVVV	Port Vila	RDARA 9	
<b>VIET NAM</b>			
VVNB	Ha Noi	SEA 2	
VVTS	Ho Chi Minh	SEA 2	
<b>WALLIS &amp; FUTUNA IS. (France)</b>			
NLWW	Wallis/Hihifo	RDARA 9	







**TABLE CNS II-5**

**ATS INTER-FACILITY DATA COMMUNICATION (AIDC)  
IMPLEMENTATION PLAN**

EXPLANATION OF THE TABLE

*Column*

- 1 State/Administration – the name of the State/Administration;
- 2 Location of AIDC end system – the location of the AIDC end system under the supervision of State/Administration identified in column 1;
- 3 AIDC Pair – the correspondent AIDC end system;  
Location – location of the correspondent AIDC end system  
State/Administration – the name of the State/Administration responsible for management of the correspondent AIDC end system  
A “/” is placed between the location and State/Administration
- 4 Transmission Means – the transmission means used for the AIDC messages exchanged between the corresponding AIDC pair, AFTN, AFTN/AMHS;
- 5 Target Date of Implementation – date of implementation of the AIDC end system in the form of xQyyyy or yyyy (quarter year);
- 6 Remarks – any additional information describing the AIDC end system or the AIDC service between the corresponding AIDC pair.

State/Administration	Location of AIDC System ATSU1	AIDC System Pair		Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration				
1	2	3		4	5	6
AFGHANISTAN	Kabul ACC	Kabul ACC /Afghanistan		AFTN/AMHS		
AUSTRALIA	Brisbane ACC	Oakland ARTCC /USA		AFTN	Implemented	
				AFTN/AMHS		
		Auckland ACC /New Zealand		AFTN	Implemented	
				AFTN/AMHS		
		Melbourne ACC /Australia		AFTN	Implemented	
				AFTN/AMHS		
		Makassar ACC /Indonesia		AFTN	4Q2015	
			AFTN/AMHS			
	Nadi ACC /Fiji		AFTN	Implemented		
			AFTN/AMHS	Implemented		
	Port Moresby/PNG		AFTN			
			AFTN/AMHS	3Q2016		
	Brisbane ACC /Australia		AFTN	Implemented		
			AFTN/AMHS			
Melbourne ACC	Jakarta ACC /Indonesia		AFTN			
			AFTN/AMHS			
	Mauritius ACC /Mauritius		AFTN	Implemented		
			AFTN/AMHS			
BANGLADESH	Dhaka ACC	Kolkata ACC /India		AFTN/AMHS	2017	
		Yangon ACC /Myanmar		AFTN/AMHS	2017	
BHUTAN						
BRUNEI DARUSSALAM						
CAMBODIA	Phnom Penh ACC	Bangkok ACC /Thailand		AMHS	2016	
		Vientiane ACC/Laos PDR		AMHS	2016	
		Ho Chi Minh ACC/Viet Nam		AFTN/AMHS	2016	

State/Administration	Location of AIDC System ATSU1	AIDC System Pair	Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration			
1	2	3	4	5	6
CHINA	Beijing ACC	Incheon ACC /Republic of Korea	AFTN		
		Ulaanbaatar ACC/Mongolia	AFTN	2016	
	Sanya ACC	Hong Kong ACC /Hong Kong, China	AFTN	Implemented	
		Ho Chi Minh ACC /Vietnam	AFTN		
	Kunming ACC	Yangon ACC /Myanmar	AFTN	2016	
	Guangzhou ACC	Hong Kong ACC /HK China	AFTN		
	Taibei ACC	Hong Kong ACC /HK China	AFTN	Implemented	
	Urumqi ACC	Lahore ACC /Pakistan			
	Qungdao ACC	Incheon ACC /Republic of Korea	AFTN	2015	
Shanghai ACC	Fukuoka ATMC /Japan	AFTN			
HONG KONG, CHINA	Hong Kong ACC	Guangzhou ACC /China	AFTN		
		Sanya ACC /China	AFTN	Implemented	
		Manila ACC /Philippines	AMHS		
		Taibei ACC /China	AFTN	Implemented	
MACAO, CHINA	Macao ATZ				Automatic transfer of control with adjacent ATC units is applicable instead of AIDC
COOK ISLANDS					
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA					
FIJI	Nadi ACC	Auckland ACC /New Zealand	AFTN	Implemented	ICD V.1.0
		Brisbane ACC /Australia	AFTN/AMHS	Implemented	ICD V. 1.0
		Oakland ARTCC /USA	AFTN/AMHS	Implemented	ICD V.1.0
FRANCE FRENCH POLYNESIA NEW CALEDONIA	Papeete ACC				
		Auckland ACC /New Zealand	AFTN	Implemented	ICD V. 2.0
		Oakland ARTCC /USA	AFTN	Implemented	

State/Administration	Location of AIDC System ATSU1	AIDC System Pair	Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration			
1	2	3	4	5	6
INDIA	Ahmedabad ACC	Karachi ACC /Pakistan	AFTN	3Q2016	
	Chennai ACC	Colombo ACC / Sri Lanka	AFTN	3Q2016	
		Jakarta ACC /Indonesia	AFTN		
		Kuala Lumpur ACC / Malaysia	AFTN	1Q2016	
		Male ACC /Maldives	AFTN	2017	
		Yangon ACC /Myanmar	AFTN	2017	
		Delhi ACC	Karachi ACC /Pakistan	AFTN	
	Kolkata ACC	Lahore ACC /Pakistan	AFTN		
		Dhaka ACC /Bangladesh	AFTN	2017	
		Yangon ACC /Myanmar	AFTN	2016	
	Mumbai ACC	Kathmandu ACC /Nepal	AFTN		
		Karachi ACC /Pakistan	AFTN/AMHS		
		Male ACC /Maldives	AFTN	2017	
		Muscat ACC /Oman	AFTN		
Varanasi ACC	Seychelles ACC / Mauritius	AFTN			
	Kathmandu ACC /Nepal	AFTN			
INDONESIA	Jakarta ACC	Melbourne /Australia	AFTN/AMHS		
		Colombo ACC / Sri Lanka	AFTN		
		Singapore ACC /Singapore	AFTN		
		Kuala Lumpur ACC / Malaysia	AFTN		
		Kota Kinabalu ACC /Malaysia	AFTN		
		Chennai ACC /India	AFTN		
	Makassar ACC	Brisbane ACC /Australia	AFTN	4Q2015	
JAPAN	Fukuoka ATMC		AFTN/AMHS		
		Port Moresby ACC/ PNG	AFTN		
		Kota Kinabalu ACC / Malaysia	AFTN		
		Manila ACC /Philippines	AFTN		
		Anchorage ACC /USA	AFTN	Implemented	ICD V.2.0
		Incheon ACC /Republic of Korea	AFTN	Implemented	ICD V.1.0
		Oakland ARTCC /USA	AFTN	Implemented	ICD V.2.0
		Shanghai ACC /China	AFTN		
Taipei ACC /Taipei, China	AFTN	Implemented	ICD V.3.0		
KIRIBATI					

State/Administration	Location of AIDC System ATSU1	AIDC System Pair	Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration			
1	2	3	4	5	6
LAO PEOPLE'S DEMOCRATIC REPUBLIC	Vientiane ACC	Bangkok ACC /Thailand	AMHS	2Q2015	
		Hanoi ACC /Veitnam	AFTN	2017	
MALAYSIA	Kuala Lumpur ACC	Phnom Penh ACC /Cambodia	AMHS	2016	
		Yangoon/ Myanmar	AFTN	2016	
		Ho Chi Minh/ Vietnam	AFTN	2017	
		Bangkok ACC /Thailand	AFTN	2Q2016	ICD V.3.0
		Singapore ACC /Singapore	AFTN	1Q2016	ICD V.3.0
		Chennai ACC /India	AFTN	1Q2016	ICD V.3.0
		Ho Chi Minh ACC /Vietnam	AFTN	1Q2016	ICD V.3.0
		Jakarta ACC /Indonesia	AFTN		ICD V.3.0
		Singapore ACC /Singapore	AFTN	4Q2015	ICD V.3.0
		Jakarta ACC /Indonesia	AFTN		
	Kota Kinabalu ACC	Makassar ACC /Indonesia	AFTN	4Q2015	
		Manila ACC /Philippines	AFTN	2Q2016	ICD V.3.0
	Kuching ACC	Singapore ACC /Singapore	AFTN	1Q2016	ICD V.3.0
	Colombo ACC/ Sri Lanka	AFTN	2017		
	Melborne ACC /Australia	AFTN	2017		
MALDIVES	Male ACC	Mumbai ACC / India	AFTN	2017	
		Chennai ACC /India	AFTN	2017	
		Mauritius ACC/Mauritius	AFTN	2017	
MARSHALL ISLANDS					
MICRONESIA (FEDERATED STATE OF)					
MONGOLIA		Beijing ACC/ China	AFTN	2016	

State/Administration	Location of AIDC System ATSU1	AIDC System Pair	Transmission Means	Target date of Implementation xQyyy	Remarks
		ATSU2 /Correspondent State – Administration			
1	2	3	4	5	6
MYANMAR	Yangon ACC	Bangkok ACC /Thailand	AFTN	2016	ICD V.2.0
		Kolkata ACC /India	AFTN	2016	
		Chennai ACC /India	AFTN	2017	
		Kunming ACC /China	AFTN	2016	
		Vientianne ACC /Lao PDR	AFTN	2016	
		Dhaka ACC /Bangladesh	AFTN	2017	
		Varanasi ACC /India	AFTN		
NEPAL	Kathmandu ACC	Kolkata ACC /India	AFTN		
		Lhasa ACC /China	AFTN		
		Nadi ACC /Fiji	AFTN	Implemented	ICD V.1.0
		Port Moresy ACC/ PNG	AFTN	3Q2016	
NEW ZEALAND	Auckland ACC	Brisbane ACC /Australia	AFTN	Implemented	ICD V.1.0
		Nadi ACC /Fiji	AFTN	Implemented	ICD V.1.0
		Oakland ARTCC /USA	AFTN	Implemented	ICD V.2.0
		Papeete ACC /French Polynesia	AFTN	Implemented	ICD V.2.0
			AFTN/AMHS		
PAKISTAN	Karachi	Mumbai ACC /India	AFTN		
		Muscat ACC /Oman	AFTN		
		Tehran ACC /Iran	AFTN		
		Delhi ACC /India	AFTN		
		Ahmadabad ACC /India	AFTN	3Q2016	
		Kabul ACC /Afghanistan	AFTN		
	Lahore ACC	Delhi ACC /India	AFTN		
		Urumqui ACC /China	AFTN/AMHS		
PALAU		Tajakistan ACC /Tajakistan	AFTN		

State/Administration	Location of AIDC System ATSU1	AIDC System Pair	Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration			
1	2	3	4	5	6
PHILIPPINES	Manila ACC	Hong Kong ACC /Hong Kong, China	AFTN	4Q2016	
			AFTN/AMHS		
		Singapore ACC /Singapore	AFTN	4Q2015	
			AFTN/AMHS		
		Taibei ACC/Taibei, China	AFTN	2Q2016	
			AFTN/AMHS		
		Kota Kinabalu ACC /Malaysia	AFTN	2Q2016	
			AFTN/AMHS		
		Ho Chi Minh ACC /Viet Nam	AFTN		
			AFTN/AMHS		
		Oakland ARTCC /USA	AFTN	1Q2017	
			AFTN/AMHS		
		Fukoka ATMC /Japan	AFTN		
			AFTN/AMHS		
		Makasar ACC /Indonesia	AFTN		
			AFTN/AMHS		
REPUBLIC OF KOREA	Incheon ACC	Fukoka ATMC /Japan	AFTN	Implemented	ICD V.1.0
		Qingdao ACC /China	AFTN	2015	
SAMOA					
SINGAPORE	Singapore ACC	Ho Chi Minh ACC /Vietnam	AFTN/AMHS	Implemented	
		Manila ACC /Philippines	AFTN/AMHS	4Q2015	
		Jakarta ACC /Indonesia	AFTN/AMHS		
		Kuala Lumpur ACC /Malaysia	AFTN/AMHS	1Q2016	
		Kota Kinabalu ACC /Malaysia	AFTN/AMHS	4Q2015	
		Kuching /Malaysia	AFTN/AMHS	1Q2016	
SOLOMON ISLANDS		Nadi ACC /Fiji			
		Port Moresby ACC/PNG			
		Brisbane ATSC /Australia			
SRI LANKA	Colombo ACC	Male ACC /Maldives	AFTN/AMHS	2017	
		Jakarta ACC / Indonesia	AFTN/AMHS		
		Chennai ACC /India	AFTN/AMHS	3Q2016	
		Melbourne ACC /Australia	AFTN/AMHS	1Q2017	

State/Administration	Location of AIDC System ATSU1	AIDC System Pair		Transmission Means	Target date of Implementation xQyyyy	Remarks
		ATSU2 /Correspondent State – Administration				
1	2	3		4	5	6
TIMOR LASTE						
THAILAND		Kuala Lumpur ACC /Malaysia		AFTN	2Q2016	
		Phnom Penh ACC /Cambodia		AMHS	2016	
		Vientiane ACC /Lao PDR		AMHS	2Q2015	
		Yangon ACC /Myanmar		AFTN	2016	
TONGA						
UNITED STATES	Oakland ARTCC	Auckland OAC /New Zealand		AFTN	Implemented	ICD V.2.0
		Fukuoka ATMC /Japan		AFTN	Implemented	ICD V.2.0
		Nadi ATMC /Fiji		AFTN	Implemented	ICD V.2.0
		Brisbane ACC /Australia		AFTN	Implemented	ICD V.2.0
		Tahiti ACC /Tahiti		AFTN	Implemented	ICD V.2.0
		Port Moresby/PNG		AFTN	3Q2016	
	Anchorage ARTCC	Manila /Philippines		AFTN	1Q2017	
		Anchorage ARTCC /United States		AFTN	Implemented	ICD V.2.0
		Fukuoka ATMC /Japan		AFTN	Implemented	ICD V.2.0
		Oakland ARTCC /United States		AFTN	Implemented	ICD V.2.0
VIET NAM	Ho Chi Minh ACC	Sanya ACC /China		AFTN		
				AFTN/AMHS		
		Phnom Penh ACC /Cambodia		AFTN/AMHS	2016	
		Vientiane ACC /Lao PDR		AFTN/AMHS	2017	
		Singapore ACC /Singapore		AFTN/AMHS	Implemented	ICD V.3.0
		Manila /Philippines		AFTN		
		Kuala Lumpur /Malaysia		AFTN	1Q2016	



**Table CNS II-6**

**RADIO NAVIGATION AIDS**

EXPLANATION OF THE TABLE

*Column*

- 1 Name of the State and city (and aerodrome if different name than the city) or, for en-route aids, the location of the facility.
- 2 The designator number and runway type:  
NINST — Visual flight runway  
NPA — Non-precision approach runway  
PA1 — Precision approach runway, Category I  
PA2 — Precision approach runway, Category II  
PA3 — Precision approach runway, Category III  
and functions:  
T — Terminal  
E — En route
- Note.— Precision approach category refers to the standard of facility performance to be achieved and maintained in accordance with the relevant Annex 10 specifications and not to the specifications of the ILS equipment itself, which are not necessarily the same.*
- 3 ILS — Instrument landing system
- 4 L — Locator, either associated with an ILS or for use as an approach aid at an aerodrome.
- 5 DME — Distance measuring equipment. Aligned with the ILS shown in column 3 when the DME is required to serve as a substitute for a marker beacon. When aligned with VOR in column 6, indicates the DME to be collocated with the VOR.
- 6 VOR — VHF omnidirectional radio range.
- 7 Blank
- 8 Implementation Status for ILS
- 9 Implementation status for Locator
- 10 Implementation status for DME
- 11 Implementation status for VOR

*Column*

12      Remarks

*Note.— Columns 3 to 6 use the following symbols:*

R – Required

Blank Entry would mean no requirement.

*Note.— Columns 8 to 11 use the following symbols:*

I — Implemented.

X — Implementation status undetermined. (in red)

N — Not implemented. (in red)

P --- Planned (need to fill up Remarks column with planned implementation date in MM/YY format)

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State City/location (aerodrome)	Requirements					7	Implementation Status (July 15)				Remarks
	Runway Function	ILS	L	DME	VOR		ILS	L	DME	VOR	
1	2	3	4	5	6		8	9	10	11	12
<b>AMERICAN SAMOA (United States)</b>											
PAGO PAGO	05 PA1	R	R	R	R		X	X	X	X	
	T			R	R				X	X	
	E			R	R				X	X	
<b>AUSTRALIA</b>											
Adelaide	PA1	R		R	R						
	T			R	R		I		I	I	
	E			R	R				I	I	
Albany	PA1	R		R							NDB
	T			R			I		I		NDB
Albury	NPA			R	R						
	T			R	R				I	I	
	E			R	R				I	I	
Alice Springs	PA1	R		R	R						
	T			R	R		I		I	I	
	E			R	R				I	I	
Amberly	PA1	R					I				DoD
Armidale	NPA			R							NDB
	T			R					I		NDB
	E			R					I		NDB
Avalon	PA1	R		R	R				I		
	T			R	R		I		I	I	
	E			R	R				I	I	
Ayers Rock	NPA			R					I		NDB
	T			R					I		NDB
	E			R					I		NDB
Beermullah	PA1	R					I				DoD
Brisbane	01 PA1	R		R	R		I		I	I	
	19PA1	R		R	R		I		I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Broken Hill	NPA			R	R				I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Broome	NPA			R					I		NDB
	T			R					I		NDB
	E			R					I		NDB
Cairns	15PA1	R		R	R		I		I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Canberra	35PA1	R		R	R		I		I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Carnarvon	NPA			R	R				I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Christmas Island	NPA			R	R				I	I	
	T			R	R				I	I	
	E			R	R				I	I	
Cocos Island	NPA			R	R				I	I	
	T			R	R				I	I	

	E		R	R				
Coffs Harbour	NPA		R	R				
	T		R	R				
	E		R	R				
Cooma	NPA		R	R				
	T		R	R				
	E		R	R				
Cunnamulla	NPA		R	R				
	T		R	R				
	E		R	R				
Curtin	NPA		R	R				
	T		R	R				
	E		R	R				
Darwin	29PA1	R	R	R	I			
	T		R	R				
	E		R	R				
East Sale	22PA1	R	R		I			DoD
	T	R	R		I			DoD
Edinburgh	18PA1	R			I			DoD
Esperance	NPA		R	R				
	T		R	R				
	E		R	R				
Essendon	16PA1	R			I			
	T	R			I			
Geratton	NPA		R	R				
	T		R	R				
	E		R	R				
Gladstone	10PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Gold Coast	NPA		R	R				
	T		R	R				
	E		R	R				
Gove	NPA		R	R				
	T		R	R				
	E		R	R				
Groote Eylandt	NPA		R					NDB
	T		R					NDB
	E		R					NDB
Hamilton Island	NPA		R	R				
	T		R	R				
	E		R	R				
Hobart	12PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Kalgoorie	NPA		R	R				
	T		R	R				
	E		R	R				
Karratha	NPA		R	R				
	T		R	R				
	E		R	R				
Kununurra	NPA		R	R				
	T		R	R				
	E		R	R				
Launceston	32PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Learmonth	NPA		R	R				
	T		R	R				

	E		R	R				
Lord Howe Island	NPA		R					NDB
	T		R					NDB
	E		R					NDB
Mackay	NPA		R	R				
	T		R	R				
	E		R	R				
Managalore	NPA			R				
	E			R				
Meekatharra	NPA		R	R				
	T		R	R				
	E		R	R				
Melbourne	16PA3	R	R	R	I			
	27PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Merimbula	NPA		R					NDB
	T		R					NDB
	E		R					NDB
Mildura	NPA		R	R				
	T		R	R				
	E		R	R				
Moomba	NPA		R					NDB
	T		R					NDB
	E		R					NDB
Mount Gambier	NPA			R				
	T			R				
	E			R				
Mount Isa	NPA		R	R				
	T		R	R				
	E		R	R				
Newman	NPA		R	R				
	T		R	R				
	E		R	R				
Norfolk Island	NPA		R	R				
	T		R	R				
	E		R	R				
Nowra	21PA1	R	R		I			DoD
	T		R					DoD
	E		R					DoD
Oakey	14PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Paraburdoo	NPA		R	R				
	T		R	R				
	E		R	R				
Parkes	NPA		R	R				
	T		R	R				
	E		R	R				
Pearce	36PA1	R			I			DoD
	18PA1	R			I			DoD
Perth	03PA1	R	R	R	I			
	21PA1	R	R	R	I			
	24PA1	R	R	R	I			
	T		R	R				
	E		R	R				
Port Headland	NPA		R	R				
	T		R	R				
	E		R	R				

Proserpine	NPA			R	R						
	T			R	R						
	E			R	R						
Richmond	28PA1	R								DoD	
Rock Hampton	NPA			R	R						
	T			R	R						
	E			R	R						
Sydney	34R PA1	R		R	R						
	34L PA2	R		R	R						
	16R PA2	R		R	R						
	16L PA1	R		R	R						
	25PA1	R		R	R						
	7PA1	R		R	R						
	T			R	R						
Tamworth	30R PA1	R	R	R	R						
	T			R	R						
	E			R	R						
Tennant Creek	NPA			R	R						
	T			R	R						
	E			R	R						
Tindal	14PA1	R			R					DoD	
	T				R						
	E				R						
Townsville	01PA1	R		R	R						
	T			R	R						
	E			R	R						
Wagga Wagga	23PA1	R		R	R						
	T			R	R						
	E			R	R						
Weipa	NPA			R	R						
	T			R	R						
	E			R	R						
Williamsdale	E				R						
Williamstown	12PA1	R								DoD	
Yarrowee	E				R						
<b>BANGLADESH</b>											
CHITTAGONG	NPA		R	R	R				X	X	X
	T			R	R					X	X
	E			R	R					X	X
COMILLA	E				R						X
DHAKA (Zia intl)	14 PA1	R	R	R	R			X	X	X	X
	T			R	R					X	X
	E			R	R					X	X
RAJSHAHI	E				R						X
SAIDPUR	E				R						X
<b>BHUTAN</b>											
PARO	NPA		R		R				X		X
	T		R		R				I		X
	E				R						X

**BRUNEI DARUSSALAM**

BRUNEI	21 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I

**CAMBODIA**

PHNOM PENH	23 PA1	R	R	R	R	X	X	I	I
	T			R	R			X	X
	E			R	R			X	X
SIEM REAP (Ankor)	NPA		R	R	R		X	I	I
	T			R	R			X	X
	E			R	R			X	X

**CHINA**

ALTAY	E								
BOSE	E			R	R			I	I
BAOTOU	E			R	R			I	I
BANTAJI	E								
BEIJING (Capital)	18R PA1	R	R	R		I	I	I	
	36L PA1	R	R			I	I		
	18L PA1	R	R			I	I		
	36R PA2	R	R	R	R	I	I	I	I
CHANGCHUN	E			R	R			I	I
CHANGSHA	36 PA1	R	R	R	R	I	I	I	I
	18 PA1	R	R			I	I		
CHANGWU	E								
CHAOYANG	E			R	R			I	I
CHENGDU	20 PA1	R	R	R	R	I	I	I	I
	02 PA1	R	R			I	I		
CHONGQING	02 PA1	R	R	R	R	I	I	I	I
	20 PA1	R	R			I	I		
DAGUSHAN	E								
DAHUSHAN	E			R	R			I	I
DALIAN	28 PA1	R	R	R	R	I	I	I	I
	10 PA1	R	R			I	I		
	E			R	R			I	I
DANDONG	E			R	R			I	I
DARONGJIANG	E								
DAWANGZHUANG	E			R	R			I	I







LONGZHOU	E								
LUXI	E		R	R				I	I
MAGUOHE	E								
MAKUNG	E		R	R				X	X
	E								
NANHUI	E		R	R				I	I
NANJING (Lukou)	06 PA1	R	R	R	R	I	I	I	I
	24 PA1	R	R			I	I		
NANNING (Wuxu)	05 PA1	R	R	R	R	I	I	I	I
	NPA		R				I		
	E			R	R			I	I
NANTONG	E		R	R				I	I
NANXIONG	E								
NANXUN	E								
PINGZHOU	E		R	R				I	I
PIXIAN	E		R	R				I	I
POTOU	E		R	R				I	I
QIANXI	E		R	R				I	I
QIEMO	E		R	R				I	I
QINGBAIKOU	E								
QINGDAO	35 PA1	R	R	R		I	I	I	
	17 PA1	R	R			I	I		
QIQIHAR	E	R		R	R	I		I	I
SANYA	08 PA1	R	R	R	R	I	I	I	I
	NPA		R				I		
SHACHE	E		R	R				I	I
SHANGRAO	E		R	R				I	I
SHANGHAI (Hongqiao)	18 PA1	R	R	R	R	I	I	I	I
	36 PA1	R	R			I	I		
	E			R	R			I	I
SHANGHAI (Pudong)	17 PA1	R	R	R	R	I	I	I	I
	35 PA1	R	R	R		I	I	I	
SHANTOU	E		R	R				I	I
SHENYANG (Taoxian)	06 PA1	R	R	R	R	I	I	I	I

	24 PA1	R	R			I	I		
SHENZHEN	33 PA1	R	R	R	R	I	I	I	I
	15 PA1	R	R	R		I	I	I	
SHILONG	E			R	R			I	I
TACHENG	E			R				I	
TAIBEI (Songshan)	10 PA1	R	R			X	X		
TAIBEI (Taoyuan)	05L PA2	R	R	R	R	X	X	X	X
	23R PA2	R	R	R		X	X	X	
	T			R	R			X	X
	E			R	R			X	X
	06 PA1	R		R	R	X		X	X
	24 PA1	R		R	R	X		X	X
TAIJUAN (Wusu)	31 PA1	R	R		R	I	I		I
	13 PA1	R	R			I	I		
	E				R				I
TIANJIN (Binhai)	34 PA1	R	R	R	R	I	I	I	I
	16 PA1	R	R	R		I	I	I	
	E			R	R			I	I
TANGHEKOU	E								
TIANZHEN	E								
TONGLIAO	E			R	R			I	I
TONGLU	E			R	R			I	I
TUMURTAI	E			R	R			I	I
ULANHOT	E			R	R			I	I
URUMQI (Diwopu)	25 PA1	R	R	R	R	I	I	I	I
	07 PA1	R	R			I	I		
	E			R	R			I	I
WAFANGDIAN	E								
WANGBINGOU	E								
WANGQING	E			R	R			I	I
WEIXIAN	E			R	R			I	I
WONGYUAN	E			R	R			I	I
WUFENGXI	E			R	R			I	I
WUHAN (Tianhe)	04 PA1	R	R	R	R	I	I	I	I
	22 PA1	R	R	R		I	I	I	
	E			R	R			I	I
WUXI	E			R	R			I	I

XIAMEN (Gaoqi)	05 PA1	R	R	R	R	I	I	I	I
	NPA		R				I		
XI'AN (Xianyang)	05 PA1	R	R	R	R	I	I	I	I
	23 PA1	R	R			I	I		
XICHANG (Qingshan)	36 PA1	R	R	R	R	I	I	I	I
	NPA		R				I		
XINGLIN	E								
XINGTANG	E								
XUEJIADAO	E			R	R			I	I
XUYONG	E			R	R			I	I
YABRAI	E								
YINGDE	E			R	R			I	I
YINCHUAN	E			R	R			I	I
YUNHE	E								
ZHOUKOU	E			R	R			I	I
ZHULIAO	E								
<b>COOK IS.</b>									
RAROTONGA	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>DEMOCRATIC PEOPLE'S REP. OF KOREA</b>									
PYONGYANG	NPA		R	R	R		I	X	X
	35 PA1	R	R			I	I		
	01 PA1	R	R			I	I		
	19 PA1	R	R			I	I		
	T			R	R			I	I
E			R	R			I	I	
<b>FIJI</b>									
NADI	02 PA1	R	R			I	I		
	T			R	R			I	I
	E			R	R			I	I
SUVA (Nausori)	NPA		R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
<b>FRENCH POLYNESIA (France)</b>									
RANGIROA	NPA		R	R	R		I	I	I

	T			R	R				
	E				R				
TAHITI (Faaa)	04 PA1	R	R	R	R				
	T			R	R				
	E			R	R				
<b>GUAM (United States)</b>									
GUAM I.	06L PA1	R	R	R	R	X	X	X	X
	T			R	R			X	X
	E			R	R			X	X
GUAM I. (Anderson AFB)	06R PA1	R		R	R	X		X	X
	T			R	R			X	X
	E			R	R			X	X
<b>HONG KONG, China</b>									
HONG KONG	07R PA2	R		R	R				
	25L PA2	R		R	R				
	T			R	R				
	E			R	R				
	E			R	R				
	07L PA2	R		R	R				
	25R PA3	R		R	R				
<b>INDIA</b>									
AHMEDABAD	23 PA1	R	R	R	R				
	T			R	R				
	E			R	R				
AMRITSAR	34 PA1	R		R	R				
	T			R	R				
	E			R	R				
BAGDOGRA	E			R	R			X	X
BELGAUM	E			R	R				
BHUBANESHWAR	E			R	R				
CALICUT	NPA		R	R	R		X		
CHENNAI	07 PA1	R	R	R	R				
	T			R	R				
	E			R	R				
COIMBATORE	E			R	R				
DELHI (Indira Gandhi)	28 PA2	R	R	R	R				
	27 PA1	R		R	R				
	T			R	R				
	E			R	R				
GUWAHATI	E			R	R			X	X
IMPHAL	E			R	R			X	X

KOLKATA	19L PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
LUCKNOW	27 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
MADURAI	E			R				I	
MUMBAI (Chhatrapati Shiviji Intl)	27 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
NAGPUR	32 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
PATNA	25 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
PORT BLAIR	E			R	R			I	I
PRATAPGARH	E			R	R			I	I
SILCHAR	E			R	R			X	X
TIRUCHCHIRAPPALLI	27 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
TRIVANDRUM	32 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
VARANASI	27 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
VISHAKHAPATNAM	E			R	R			I	I
<b>INDONESIA</b>									
AMBON (Patimura)	22 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
BALI (Ngurah Rai)	27 PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
BALIKPAPAN (Sepinggan)	25 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
BANJARMASIN (Syamsudin Noor)	10 PA1	R	R	R	R	I	I	I	I

	E		R	R				I	I
	T		R	R				I	I
BATAM (Hang Nadmn)	04 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
BIAK (Frans Kaisiepo)	11 PA1	R	R	R	R	X	X	I	I
	T			R	R			I	I
	E			R	R			I	I
JAKARTA (Halim Perdanakusuma)	24 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
JAKARTA (Soekamo Hattal)	07R PA1	R	R	R	R			I	I
	07L PA1	R	R	R	R	N		I	I
	T		R	R	R			I	I
	E		R	R	R			I	I
JAYAPURA (Sentani)	30 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
KETAPANG	34 PA1	R		R	R	N		N	N
	T			R	R			N	N
	E			R	R			N	N
KUPANG (El Tari)	25 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
MANADO (Sam Ratulangi)	18 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
MEDAN (Polonia)	05 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
MERAUKE (Mopah)	NPA		R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
PADANG (Tabing)	NPA		R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
PALEMBANG (Sultan Mahmud Badaruddin II)	27 NPA	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
PANGKALPINANG	NPA			R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
PEKANBARU	36 PA1	R	R	R	R			I	I
	T			R	R			I	I

	E			R	R			I	I
PONTIANAK (Supadio)	15 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
SURABAYA (Juanda)	10 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
TANJUNG PINANG (Kijang)	NPA		R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
TARAKAN	NPA		R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
TIMIKA(Tembagapura)	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
UJUNG PANDANG (Hasanuddin)	13 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
<b>JAPAN</b>									
ASAHIKAWA	E			R	R			I	I
DAIGO	E			R				I	
ERABU	E			R	R			I	I
FUKUE	E			R	R			I	I
FUKUOKA	16 PA1	R	R	R	R			I	I
	34 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
GOBOH	E			R				I	
HAKODATE	12 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
HIROSHIMA	10 PA3	R	R	R	R			I	I
	NPA		R	R	R			I	I
	T			R	R			I	I



	E			R	R			I	I
IKI	E			R	R			I	I
IWAKI	E			R	R			I	I
KAGOSHIMA	34 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
KANSAI	06L PA2	R	R	R	R			I	I
	06R PA2	R	R	R	R			I	I
	24L PA2	R	R	R	R			I	I
	24R PA2	R	R	R	R			I	I
	T			R	R			I	I
KOMATSU	E			R	R			I	I
KOWA	E			R				I	
KUGA	E			R	R			I	I
KUMAMOTO	07 PA3	R	R	R	R			I	I
	07 PA1	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
KUSHIMOTO	E			R	R			I	I
MIHO	E			R	R			I	I
MINAMI DAITO	E			R	R			I	I
MIYAKE JIMA	E			R	R			I	I
MIYAZU	E			R	R			I	I
NAGASAKI	32 PA2	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
NAGOYA	18 PA2	R	R	R	R			I	I
	36 PA3	R	R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I

NAHA	36 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
NARITA	34L PA1	R	R	R	R	I	I	I	I
	34R PA1	R	R	R	R	I	I	I	I
	16L PA1	R	R	R	R	I	I	I	I
	16R PA3	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
NIIGATA	28 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
OITA	01 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
OKAYAMA	07 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
ONJUKU	E			R			I		
OSAKA	32L PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
OSHIMA	E			R	R			I	I
OTSU	E			R	R			I	I
SAPPORO (New Chitose)	01L PA1	R	R	R	R	I	I	I	I
	01R PA1	R	R	R	R	I	I	I	I
	19R PA3	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
SENDAI	27 PA1	R	R	R	R	I	I	I	I

		T		R	R			I	I
		E		R	R			I	I
SHIMIZU		E		R	R			I	I
SHINODA		E		R	R			I	I
TAKAMATSU	26 PA1	R	R	R	R	I	I	I	I
		T		R	R			I	I
		E		R	R			I	I
TATEYAMA		E		R				I	
TOKYO (Haneda)	22 PA1	R	R	R	R	I	I	I	I
	23 PA1	R	R	R	R	I	I	I	I
	34L PA1	R	R	R	R	I	I	I	I
	34R PA3	R	R	R	R	I	I	I	I
		T		R	R			I	I
		E		R	R			I	I
<b>JOHNSTON I (United States)</b>									
JOHNSTON ATOLL (Johnston I.)	NPA								
	T								
	E								
<b>KIRIBATI</b>									
KIRITIMATI I.	NPA			R	R			X	X
	T			R	R			X	X
	E			R	R			X	X
TARAWA (Bonriki Intl)	NPA		R	R	R	X	X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>LAO PEOPLE'S DEMOCRATIC REPUBLIC</b>									
PAKSE	E				R				X
VIENTIANE (Wattay)	14 PA1	R	R	R	R	X	X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>MACAO, China</b>									
MACAO	34 PA2	R	R	R	R	I	N	I	I
	16 IGS								
	T			R	R			I	I

	E		R	R			I	I	
<b>MALAYSIA</b>									
ALOR SETAR (Sultan Abdul Halim)									
	NPA		R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
IPOH (Sultan Azian Shah)									
	PA-I04	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
JOHOR BAHRU									
	16 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
KERTEH									
	NPA			R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
KOTA BHARU (Sultan Ismail Petra)									
	NPA		R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
KOTA KINABALU									
	02 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
KUALA TERENGGANU (Sultan Mahmud)									
	NPA		R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
KUANTAN									
	18 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
KUCHING									
	25 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
LABUAN									
	NPA	R	R	R	R	X	I	I	I
	T			R	R			I	I
	E			R	R			I	I
MALACCA									
	NPA		R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
MERSING									
	E			R	R			I	I
MIRI									
	02 PA1 02	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
PENANG									
	04 PA1	R	R	R	R	I	I	I	I



<b>MARSHALL IS.</b>									
MAJURO ATOLL (Marshall Is. Intl)	NPA			R	R			X	X
	T			R	R			X	X
	E			R	R			X	X
<b>MICRONESIA (FEDERATED STATES OF)</b>									
KOSRAE	NPA		R	R			X	X	
	T			R	R			X	X
	E			R	R			X	X
POHNAPEI	NPA			R	R			X	X
	T			R	R			X	X
	E			R	R			X	X
WENO I. (FM Chuuk Intl)	NPA		R	R			X	X	
	T			R	R			X	X
	E			R	R			X	X
YAP	NPA		R		R		X		X
	T			R	R			X	X
	E			R	R			X	X
<b>MONGOLIA</b>									
ULAANBAATAR	14 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
<b>MYANMAR</b>									
BAGO	E			R	R			I	I
CHANMYATHAZI	E				R			I	I
	T				R			I	I
DAWEI	E			R	R			I	I
	T			R	R			I	I
HEHO	T			R	R			I	I
HLEGU	T			R	R			I	I
LASHIO	E			R	R			I	I
	T			R	R			I	I
MANDALAY	17PA1	R		R	R	I		I	I
	T								
MYEIK	18PA1	R				X			
MYITKYINA	T			R	R			I	I
NAYPYITAW	16PA1	R		R	R	I		I	I
	T								
NYAUNG U	T			R	R			I	I
PATHEIN	E			R	R			I	I
	T			R	R			I	I

SITTWE	T		R	R			I	I	Not Yet Commissioned
TACHILEIK	T		R	R			I	I	
THANDWE	T		R	R			I	I	
YANGON	21PA1	R				I			Use of Hlegu VOR/DME
	T		R	R			I	I	
<b>NAURU</b>									
NAURU I.	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>NEPAL</b>									
BHAIRAHAWA	E			R	R			X	X
BIRATNAGAR	E			R	R			X	X
JANAKPUR	E				R				X
KATHMANDU	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
NEPALGUNJ	E			R	R			X	X
SIMARA	E			R	R			X	X
<b>NEW CALEDONIA (France)</b>									
NOUMEA (La Tontouta)	11 PA1	R	R	R	R		I	I	I
	T			R	R			I	I
	E			R	R			I	I
<b>NEW ZEALAND</b>									
AUCKLAND	05 PA1	R	R	R	R		I	I	I
	23 PA1	R	R				I	I	
	T			R	R			I	I
	E			R	R			I	I
CHRISTCHURCH	02 PA1	R	R	R	R		I	I	I
	20 PA1	R	R				I	I	
	T			R	R			I	I
	E			R	R			I	I
HOKITIKA	E			R				I	
WELLINGTON	NPA		R	R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
<b>NORTHERN MARIANA IS. (United States)</b>									
OBVAN (Saipan Intl)	07 PA1	R			R		X		X

	T				R					X
	E				R					X
<b>NIUE (New Zealand)</b>										
NIUE	NPA		R				X			
	T				R				X	
	E				R				X	
<b>PAKISTAN</b>										
BINDO	E				R					I
CAPE MONZE	E									
CHORE	E									
GWADAR	NPA									
	T									
HANGU	E									
ISLAMABAD (Chaklala)	30 PA2	R	R	R	R	I	X	I	I	
	T			R	R			I	I	
	E			R	R			I	I	
JIWANI	E			R	R			I	I	
	E									
KALAT	E									
KARACHI (Jinnah)	25R PA2	R	R	R	R	I	I	I	I	
	T			R	R			I	I	
	E			R	R			I	I	
LAHORE	36R PA2	R	R	R	R	I	I	I	I	
	T			R	R			I	I	
	E			R	R			I	I	
MULTAN	E			R	R			I	I	
NAWABSHAH	NPA		R	R	R		I	I	I	
	T			R	R			I	I	
	E			R	R			I	I	
PANJGUR	E			R	R			I	I	
PESHAWAR	NPA			R	R			I	I	
	T			R	R			I	I	
	E			R	R			I	I	
RAHIM YAR KHAN	E			R	R			I	I	
ZHOB	E			R	R			I	I	
<b>PALAU</b>										
KOROR	NPA		R	R	R		X	X	X	
	T			R				X		



PAPUA NEW GUINEA

KIETA				R	R				X	X
MADANG	E			R	R				X	X
MOUNT HAGEN	NINST			R					X	
NADZAB				R	R				X	X
PORT MORESBY	14L PA1	R	R	R	R	X	X		X	X
	32R PA1	R		R	R	X			X	X
	T			R	R				X	X
	E			R	R				X	X
VANIMO	NINST			R				X		
WEWAK	E			R	R			X	X	

PHILIPPINES

BACOLOD-SILAY	03PA1	R		R	R	I			I	I
	T									
	E									
BASCO	T			R					I	
BUTUAN	T			R	R				I	I
	E									
CABANATUAN	E			R	R				I	I
CAGAYAN DE ORO	E			R	R				I	I
CATICLAN	T			R					I	
CAUAYAN	NPA			R	R				I	I
	T									
	E									
CLARK	02PA1	R		R	R	I			I	I
	20PA1									
	T E									
COTABATO	NPA			R	R				I	I
	T									
	E									
DAVAO	05 PA1	R		R	R	I			I	I
	23 PA1									
	T E									
DUMAGUETE	NPA T				R				I	
ILOILO	02PA1 20PA1	R		R	R	I			I	I

	T E							
JOMALIG	E		R	R			I	I
KALIBO	NPA T E		R	R			I	I
LAOAG	NPA T E		R	R			I	I
LEGASPI	NPA T E		R	R			I	I
LIPA	E			R				I
LUBANG	E		R	R			I	I
MACTAN	04 PA1 22 PA1 T E	R	R	R	I		I	I
MANILA	06 PA1 24 PA1 T E	R	R	R	I		I	I
NAGA	NPA T E		R	R			I	I
PUERTA PRINCESA	NPA T E		R	R			I	I
ROXAS	NPA T E		R	R			I	I
SAN FERNANDO	E			R				I
SAN JOSE	NPA		R	R			I	I
SUBIC	T		R	R			I	I
TACLOBAN	NPA T E		R	R			I	I
TAMBLER	17PA1 T E	R	R	R	I		I	I
TUGUEGARAO	NPA T			R				I

ZAMBOANGA	09PA1	R		R	R	I		I	I
	T								
	E								
<b>REPUBLIC OF KOREA</b>									
ANGYANG	E				R				I
BUSAN	E				R				I
CHEONGJU	24R PA1	R			R	I			I
	24R NPA				R				I
	T				R				I
DAEGU	31L PA1	R			R	I			I
	31L NPA				R				I
	T				R				I
DALSUNG	E				R				I
GANGWON	E			R	R			I	I
GIMHAE	36L NPA			R	R			I	I
	36R PA1	R		R		I		I	
	36L PA1	R		R		I		I	
	36R NPA			R	R			I	I
	T			R	R			I	I
GIMPO	14R PA2	R		R		I		I	
	14L PA1	R	R	R		I	I	I	
	32R PA1	R	R	R		I	I	I	
	32R NPA			R	R			I	I
	32L PA1			R				I	
	32L NPA	R		R	R	I		I	I
	T			R	R			I	I
INCHEON	15R PA3	R		R		I		I	
	15L NPA			R	R			I	I
	33L PA1	R		R		I		I	
	33L NPA			R	R			I	I
	15L PA3	R		R		I		I	
	33R PA3	R		R		I		I	
	33R NPA			R	R			I	I
	T			R	R			I	I
JEJU	06 PA1	R		R		I		I	
	24 PA1	R		R		I		I	
	06 NPA			R				I	
	24 NPA			R	R			I	I
	T			R	R			I	I
	E			R	R			I	I
YANGYANG	33 PA1	R		R		I		I	
	33 NPA			R	R			I	I
	T			R	R			I	I
YANGJU	E			R	R			I	I

<b>SAMOA</b>									
FALEOLO (Faleolo Intl)	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>SINGAPORE</b>									
PAYA LEBAR	NPA				R				I
	T				R				I
SELETAR SINGAPORE (Changi)	NINST								
	02L PA2	R		R		I		I	
	20R PA1	R		R		I		I	
	02C PA1	R		R	R	I		I	I
	20C PA2	R		R	R	I		I	I
	T			R	R			I	I
E			R	R			I	I	
<b>SOLOMON IS.</b>									
HONIARA (Henderson)	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
<b>SRI LANKA</b>									
COLOMBO (Bandaranaike)	04 PA1	R	R	R	R	N	I	I	I
	22 PA1	R	R	R	R	I	I	I	I
	T			R	R			I	I
	E			R	R			I	I
HIGURAKGODA (Mineriya)	25 PA1	R		R	R	N		N	N
	T			R	R			N	N
	E			R	R			N	N
<b>THAILAND</b>									
BANGKOK / Don Mueang INTL	21LPA1	R		R	R	I		I	I
	21RPA2	R		R	R	I		I	I
	03LPA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
BANGKOK / Suvarnabhumi INTL	19LPA2	R		R	R	I		I	I
	19RPA2	R		R	R	I		I	I
	01LPA2	R		R	R	I		I	I
	01RPA2	R		R	R	I		I	I
	T			R	R			I	I
E									
CHIANG MAI / INTL	36PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I
CHIANG RAI / Mae Fah Luang - Chiang Rai INTL	03PA1	R		R	R	I		I	I
	T			R	R			I	I
	E			R	R			I	I

CHUMPHON	24PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
KHON KAEN	NPA			R	R				I	I
	T			R	R				I	I
	E			R	R				I	I
KRABI	32PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
MAE HONG SON	NPA			R	R				I	I
	T			R	R				I	I
	E			R	R				I	I
NAKHON PHANOM	15PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
NAKHON RATCHASIMA	06PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
NAKHON SI THAMMARAT	19PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
NAN	02PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
NARATHIWAT	02PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
PHITSANULOK	32PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
PHUKET / INTL	27PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
PRACHUAP KHIRI KHAN / Hua Hin	NPA			R	R				I	I
	T			R	R				I	I
	E			R	R				I	I
RANONG	02PA1	R		R	R		I		I	I
	T			R	R				I	I
	E			R	R				I	I
RAYONG / U-Tapao Pattaya INTL	18PA1	R	R	R	R		I	I	I	I
	T			R	R				I	I
	E			R	R				I	I
SONGKHLA / Hat Yai INTL	26PA1	R		R	R		I		I	I
	T			R	R				I	I

	E		R	R					
SUKHOTHAI	36PA1	R		R		I			
	T			R					DME collocated with NDB
	E			R					
SURAT THANI	22PA1	R		R	R	I			
	T			R	R				
	E			R	R				
SURAT THANI / Samui	NPA			R	R				
	T			R	R				
	E			R	R				
TAK / Mae Sot	NPA			R	R				
	T			R	R				
	E			R	R				
TRANG	08PA1	R		R	R	I			
	T			R	R				
	E			R	R				
TRAT	NPA			R					
	T			R					DME Collocated with NDB
	E			R					
UBON RATCHATHANI	23PA1	R		R	R	I			
	T			R	R				
	E			R	R				
UDON THANI	30PA1	R		R	R	I			
	T			R	R				
	E			R	R				
<b>TONGA</b>									
FUA'AMOTU	NPA		R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
VAVA'U	NPA								
	T								
	E								
<b>TUVALU</b>									
FUNAFUTI	NPA								
	T								
	E								
<b>UNITED STATES</b>									
HONOLULU	08L PA1	R	R	R	R		X	X	X
	04R PA1	R	R	R	R		X	X	X
	T			R	R			X	X
	E			R	R			X	X
KAHULUI	02 PA1	R		R	R		X		X

	T			R	R			X	X	
	E			R	R			X	X	
<b>VANUATU</b>										
PORT VILA (Bauerfield)	NPA			R	R			X	X	
	T			R	R			X	X	
	E			R	R			X	X	
SANTO (Pekoa)	NPA									
	T									
	E									
<b>VIET NAM</b>										
DA NANG	35R PA1	R	R	R	R	X	X	X	X	
	T			R	R			X	X	
	E			R	R			X	X	
HA NOI (Noi Bai)	11 PA1	R	R	R	R	X	X	X	X	
	T			R	R			X	X	
	E			R	R			X	X	
HO CHI MINH (Tan Son Nhut)	25R PA1	R	R	R	R	X	X	X	X	
	T			R	R			X	X	
	E			R	R			X	X	
<b>WALLIS AND FUTUNA IS. (France)</b>										
WALLIS (Hihifo)	NPA		R	R	R		I	I	I	02/15
	T			R	R			I	I	02/15
	E			R	R			I	I	02/15

**Table CNS II-7**

**SURVEILLANCE**

EXPLANATION OF THE TABLE

*Column*

- 1      ATS Units to consider are ACC units and Approach units responsible for International airports and alternate aerodromes, International airports and alternate aerodromes.
- 2      The category may be: R, S, T or AD. Categories R,S, T are defined in the Seamless ATM plan. AD means Aerodrome.
- 3      Indicate Yes if part(s) of the airspace referred to in Column 2 is (are) not covered by surveillance listed in column 6, and in column remarks when such gaps are planned to be bridged
- 4      Indicate Yes or No.  
  
          Indicate No in case of standalone displays of ATS surveillance data (should not be used operationally)
- 5      Indicate Yes or No
- 6      List all types of surveillance used:  
  
          PSR  
          SSRmS  
          SSRmAC  
          ADS-B  
          ADS-C  
          MLAT  
          WAM  
          PRM
- 7      According to the definition in Doc 9830 Appendix B
- 8      Remarks

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ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
<b>AFGHANISTAN</b>							
<b>AUSTRALIA</b>							
<b>International Airports</b>							
<b>Adelaide</b>	<b>C</b>						Adelaide, Summertown
TCU			YES	YES	PSR+SSRmS+SSRmAC		
APP			YES	YES	PSR+SSRmS+SSRmAC		
TWR			YES	YES	PSR+SSRmS+SSRmAC		
<b>Cairns</b>	<b>C</b>						Redden Creek, Hanns Tableland
TCU			YES	YES	PSR+SSRmS+SSRmAC		
APP			YES	YES	PSR+SSRmS+SSRmAC		
TWR			YES	YES	PSR+SSRmS+SSRmAC		
<b>Brisbane</b>	<b>C</b>						Mt Hardgrave, Brisbane, Mt Sommerville
EC			YES	YES	PSR+SSRmAC+SSRmS+ADS-B		
APP			YES	YES	PSR+SSRmAC+SSRmS+		
ACC			YES	YES	PSR+SSRmAC+SSRmS+ADS-B		
TWR			YES	YES	PSR+SSRmAC+SSRmS+ADS-B	2	
<b>Gold Coast</b>	<b>C</b>				PSR+SSRmAC+SSRmS+A-SMGCS+SMR		Mt Sommerville, Mt Hardgrave
APP			YES	YES	PSR+SSRmS+SSRmAC		
TWR			YES	YES	PSR+SSRmS+SSRmAC		
<b>Melbourne</b>	<b>C</b>						Gelliebrand Hill, Mt Macedon
EC			YES	YES	PSR+SSRmAC+SSRmS+ADS-B+		
APP			YES	YES	PSR+SSRmAC+SSRmS		
ACC			YES	YES	PSR+SSRmAC+SSRmS+ADS-B		
TWR			YES	YES	PSR+SSRmAC+SSRmS+ADS-B+A-SMGCS+SMR	2	
<b>Perth</b>	<b>C</b>						Perth, Kalamunda, Eclipse Hill
TCU			YES	YES	PSR+SSRmAC+SSRmS		
APP			YES	YES	PSR+SSRmAC+SSRmS		
TWR			YES	YES	PSR+SSRmAC+SSRmS+A-SMGCS+SMR	2	
<b>Sydney</b>	<b>C</b>						Sydney, Mt Boyce, Cecil Park
TCU			YES	YES	PSR+SSRmS+SSRmAC+WAM+MLAT		
APP			YES	YES	PSR+SSRmS+SSRmAC+WAM+MLAT		
TWR			YES	YES	PSR+SSRmS+SSRmAC+A-SMGCS+WAM+MLAT+SMR	2	
<b>Darwin</b>	<b>C</b>						Darwin, Knuckeyes Lagoon
APP			YES	YES	PSR+SSRmS+SSRmAC		
TWR			YES	YES	PSR+SSRmS+SSRmAC		
<b>Hobart</b>	<b>D</b>						Hobart
APP			YES	YES	WAM+ADS-B		
TWR			YES	YES	WAM+ADS-B		
<b>Karratha</b>	<b>D</b>						Karratha
APP			YES	YES	ADS-B		
TWR			YES	YES	ADS-B		
<b>Alternate aerodromes</b>							
<b>Alice Springs</b>	<b>D</b>						Alice Springs

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
APP			YES	YES	ADS-B		
TWR			YES	YES	ADS-B		
<b>Avalon</b>	<b>D</b>						Gellibrand Hill, Mt Macedon
APP			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
TWR			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
<b>Canberra</b>	<b>C</b>						Mt Majura, Mt Bobbara
APP			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
TWR			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
<b>Coffs Harbour</b>	<b>D</b>						The Round Mountain, Point Lookout
APP			YES	YES	SSRm(S)+SSRm(A/C)+ADS-B		
TWR			YES	YES	SSRm(S)+SSRm(A/C)+ADS-B		
<b>Kalgoorlie</b>	<b>G</b>	Over aerodrome	YES	YES	-		
<b>Launceston</b>	<b>D</b>						Launceston
APP			YES	YES	WAM+ ADS-B		
TWR			YES	YES	WAM+ ADS-B		
<b>Learmonth</b>	<b>G</b>		YES	YES	ADS-B		Learmonth
<b>Port Hedland</b>	<b>G</b>	Over aerodrome	YES	YES	-		
<b>Rock Hampton</b>	<b>D</b>						Mt Alma
APP			YES	YES	SSRm(S)+SSRm(A/C)		
TWR			YES	YES	SSRm(S)+SSRm(A/C)		
<b>Tindal</b>	<b>C</b>						Tindal
APP			YES	YES	PSR+SSRm(A/C)		
TWR			YES	YES	PSR+SSRm(A/C)		
<b>Townsville</b>	<b>C</b>						Townsville, Tabletop
APP			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
TWR			YES	YES	PSR+ SSRm(S)+SSRm(A/C)		
<b>Other aerodromes</b>							
Broome	D		YES	YES	ADS-B		Broome
Albury	D		YES	YES	Higher level SSR coverage		Mt Bobbara
Tamworth	D		YES	YES	?		The Round Mountain
Mackay	D		YES	YES	SSRm(A/C)		Swampy Ridge
Hamilton Island	D		YES	YES	SSRm(A/C)		Swampy Ridge
<b>BANGLADESH</b>							
Dhaka APP					SSRmAC		
<b>BHUTAN</b>							
<b>BRUNEI DARUSALAM</b>							
Brunei APP					PSR + SSRmAC		

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
<b>CAMBODIA</b>					SSRmAC		
<b>CHINA</b> Beijing ACC Beijing APP Beijing TWR  Tianjin APP Tianjin TWR  Shijiazhuang APP Shijiazhuang TWR  Taiyuan ACC Taiyuan APP Taiyuan TWR  Hohhot ACC Hohhot APP Hohhot TWR  Guangzhou ACC Guangzhou APP Guangzhou TWR  Shenzhen APP Shenzhen TWR  Zhuhai ACC Zhuhai APP Zhuhai TWR  Sanya ACC Sanya APP Sanya TWR  Haikou ACC Haikou APP Haikou TWR  Changsha ACC Changsha APP Changsha TWR  Enshi TWR					PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC  SSRmAC  SSRmAC  PSR + SSRmAC PSR + SSRmAC  SSRmAC  SSRmAC  PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC  SSRmAC		
Wuhan ACC Wuhan APP Wuhan TWR					PSR + SSRmAC  PSR + SSRmAC		

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1	2	3	4	5	6	7	8
Zhengzhou ACC Zhengzhou APP Zhengzhou TWR					PSR + SSRmAC		
Guilin ACC Guilin APP Guilin TWR					PSR + SSRmAC		
Nanning ACC Nanning TWR					SSRmAC SSRmAC		
Zhanjiang ACC Zhanjiang APP Zhanjiang TWR					SSRmAC SSRmAC		
Shantou ACC Shantou APP Shantou TWR					PSR + SSRmAC PSR + SSRmAC		
Kunming ACC Kunming APP Kunming TWR					PSR + SSRmAC + AC PSR + SSRmAC		
Chengdu ACC Chengdu APP Chengdu TWR					PSR + SSRmAC + ADS-C PSR + SSRmAC		
Guiyang ACC Guiyang APP Guiyang TWR					PSR + SSRmAC PSR + SSRmAC		
Chongqing ACC Chongqing APP Chongqing TWR					PSR + SSRmAC PSR + SSRmAC		
Shanghai ACC Shanghai APP Shanghai TWR					PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC		

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1	2	3	4	5	6	7	8
Jinan ACC Jinan APP Jinan TWR					SSRmAC		
Qingdao ACC Qingdao APP Qingdao TWR					SSRmAC		
Hefei ACC Hefei APP Hefei TWR					PSR + SSRmAC		
Nanjing ACC Nanjing APP Nanjing TWR					PSR + SSRmAC		
Lianyungang ACC Lianyungang APP Lianyungang TWR					SSRmAC		
Xuzhou TWR					SSRmAC		
Hangzhou ACC Hangzhou APP Hangzhou TWR					PSR + SSRmAC		
Nanchang ACC Nanchang APP Nanchang TWR					PSR + SSRmAC		
Fuzhou ACC Fuzhou APP Fuzhou TWR					PSR + SSRmAC		
Wenzou TWR					SSRmAC		
Xiamen ACC Xiamen APP Xiamen TWR					PSR + SSRmAC		
Shenyang ACC Shenyang APP Shenyang TWR					PSR + SSRmAC		

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
Dalian ACC Dalian APP Dalian TWR  Harbin ACC Harbin APP Harbin TWR  Xi'an ACC Xi'an APP Xi'an TWR  Lanzhou ACC Lanzhou APP Lanzhou TWR  Urumqi ACC Urumqi APP Urumqi TWR					PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC  SSRmAC + AC  SSRmAC  PSR + SSRmAC + AC  PSR + SSRmAC		
<b>HONG KONG, CHINA</b> Hong Kong ACC Hong Kong APP Hong Kong TWR	S T AD		Yes	Yes	PSR + SSRmAC + ADS-B PSR + SSRmAC PSR + SSRmAC + MLAT	2	SMR, A-SMGCS
<b>MACAO, CHINA</b> Macao TWR					SSRmAC		
<b>COOK ISLANDS</b>							
<b>DPR KOREA</b> <b>Pyongyang</b> Pyongyang ACC Pyongyang APP Pyongyang TWR					SSRmAC PSR + SSRmAC		PAR
<b>FIJI</b> Naid ACC Nadi APP					ADS-B + ADS-C ADS-B		
<b>FRENCH POLYNESIA</b> Tahiti ACC Tahiti APP Tahiti TWR					SSRmAC + ADS-B + ADS-C SSRmAC		

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
<b>INDIA</b>							
Chennai ACC Chennai APP Chennai TWR					PSR + ADS-C PSR + ADS-C PSR + ADS-C		MI MI A-SMGCS
Delhi ACC Delhi APP Delhi TWR					PSR + ADS-C PSR + ADS-C PSR + ADS-C		MI MI A-SMGCS
Kolkata ACC Kolkata APP Kolkata TWR					PSR + ADS-C PSR + ADS-C PSR + ADS-C		MI MI A-SMGCS
Mumbai ACC Mumbai APP Mumbai TWR					PSR + ADS-C PSR + ADS-C PSR + ADS-C		MI MI A-SMGCS
Bangalore APP Bangalore TWR					PSR PSR		MI MI
Shamshabad ACC Shamshabad APP Shamshabad TWR					PSR PSR PSR		MI MI MI
<b>INDONESIA</b>							
Jakarta ACC Jakarta APP					PSR + SSRmAC + ADS-B PSR + SSRmAC + ADS-B		ADS-B Trial ADS-C Trial, A-SMGCS
Medan ACC Medan APP					PSR + SSRmAC + ADS-B PSR + ADS-B		
Tanjung Pinang APP					SSRmAC		
Pontianak APP					ADS-B		
Pekanbaru APP					PSR + SSRmAC + ADS-B		
Palembang APP					PSR + SSRmAC + ADS-B		
Ujung Pandang ACC Ujung Pandang APP					PSR + SSRmAC + ADS-B PSR + SSRmAC + ADS-B		ADS-C Trial, A-SMGCS
Banjarmasin APP					SSRmAC + ADS-B		
Balikpapan APP					PSR + SSRmAC + ADS-B		
Yogyakarta APP					PSR		
Surabaya APP					PSR		A-SMGCS

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1	2	3	4	5	6	7	8
Bali ACC Bali APP					ADS-B		A-SMGCS
Biak APP					SSRmAC + ADS-B		
Jayapura ACC Jayapura APP					PSR PSR		
Kupang ACC Kupang APP					ADS-B ADS-B		
Tarakan ACC					PSR + ADS-B		
Batam ACC Batam APP					SSRmS SSRmS + ADS-B		
Sorong ACC					SSRmS + ADS-B		
<b>JAPAN</b> Fukuoka ATMC					ADS-C		
Narita APP Narita TWR					PSR + SSRmAC + SSRmS MLAT, PSRMLAT		SMR
Haneda TWR					MLAT		SMR
Chubu APP Chubu TWR					PSR + SSRmAC + SSRmS MLAT		SMR
Osaka APP Osaka TWR					PSR + SSRmAC + SSRmS MLAT		SMR
Kansai APP Kansai TWR					PSR + SSRmAC + SSRmS MLAT		SMR
Fukuoka ACC Fukuoka APP Fukuoka TWR					PSR + SSRmAC + SSRmS PSR + SSRmAC + SSRmS MLAT		SMR
Naha ACC Naha APP Naha TWR					PSR + SSRmAC + SSRmS PSR + SSRmAC + SSRmS MLAT		SMR
Hakodate APP					PSR + SSRmAC		
Sendai APP					PSR + SSRmAC		
Tokyo ACC Tokyo APP					PSR + SSRmAC + SSRmS PSR + SSRmAC + SSRmS		



ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
Niigata APP					PSR + SSRmAC		
Chubu APP					PSR + SSRmAC + SSRmS		
Hiroshima APP					PSR + SSRmAC		
Takamatsu APP					PSR + SSRmAC		
Kochi APP					PSR + SSRmAC		
Matsuyama TWR					SSRmAC		
Kitakyusyu TWR					SSRmAC		
Nagasaki APP					PSR + SSRmAC		
Oita APP					PSR + SSRmAC		
Kumamoto APP					PSR + SSRmAC		
Miyazaki APP					PSR + SSRmAC		
Kagoshima APP					PSR + SSRmAC		
Shimajiri APP					PSR + SSRmAC		
Ishigaki APP					PSR + SSRmAC		
Sapporo ACC					PSR + SSRmAC + SSRmS		
<b>KIRIBATI</b>							
<b>LAO PDR</b> Vientiane ACC Vientiane APP					SSRmAC + SSRmS PSR		

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
<b>MALAYSIA</b> Langkawi APP  Kuala Lumpur ACC Lumpur APP  Johor Bharu APP  Kota Bharu APP  K. Kinabalu ACC K. Kinabalu APP  Kuching ACC Kuching APP Kuching TWR  Miri APP					PSR + SSRmAC  PSR + SSRmAC + SSRmS PSR + SSRmAC + ADS-C  PSR + SSRmS  PSR + SSRmS  PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC		
<b>MALDIVES</b>							
<b>MARSHALL ISLANDS</b>							
<b>MICRONESIA (FEDERATED STATE OF)</b>							
<b>MONGOLIA</b> Ulaanbaatar ACC Ulaanbaatar APP					ADS-C ADS-C		
<b>MYANMAR</b> Yangon ACC Yangon APP  Mandalay APP					SSRmAC + SSRmS + ADS-C SSRmAC + SSRmS + ADS-C  PSR + SSRmAC + SSRmS		
<b>NAURU</b>							
<b>NEPAL</b> Kathmandu APP					PSR + SSRmAC		
<b>NEW CALEDONIA</b> Tontouta ACC Tontouta APP	A, D G	Yes	Yes	Not applicable	ADS-B	Not applicable	ADS-B Tier 3 implemented, Tier 2 in progress
<b>NEW ZEALAND</b> Christchurch ACC Christchurch TWR					PSR + SSRmAC + SSRmS		

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1	2	3	4	5	6	7	8
Auckland ACC Auckland TWR  Wellington TWR  Queenstown TWR					SSRMAC + SSRmS		Auckland A-SMGCS has no SMR  Wide Area MDS planned for Queenstown in 2010
<b>PAKISTAN</b> Karachi ACC Karachi APP Karachi TWR  Lahore ACC Lahore APP Lahore TWR  Islamabad APP Islamabad TWR			Yes  Yes  Yes	Yes  Yes  No	PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC	Nil  Nil  Nil	
<b>PAPUA NEW GUINEA</b> Jacksons APP  Moresby ACC					PSR + SSRmAC  PSR + SSRmAC		
<b>PHILIPPINES</b> Manila ATM Center Manila ACC Manila APP  Clark APP  Mactan APP  Kalibo/Caticlan APP  Bacolod APP  Davao APP					SSRMAC + SSRmS + ADS-B SSRMAC + SSRmS PSR + SSRmAC + SSRmS  PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC + SSRmS  PSR + SSRmAC + SSRmS  PSR + SSRmAC + SSRmS		Planned implementation on Dec. 16      Planned implementation on Dec. 16  Planned implementation on Dec. 16  Planned implementation on Dec. 16

ATS Units Served	Category of airspace	Surveillance Gaps	Integration of Surveillance Information into ATC Situation Display	Multi-Surveillance Data Processing Capability	Surveillance Used	Level of A-SMGCS Implemented	Remarks
1	2	3	4	5	6	7	8
<b>REPUBLIC OF KOREA</b> Jeju APP Jeju TWR  CheongjuTWR  Seoul ACC Seoul APP Incheon TWR  Yangyang TWR  Gimhae APP Gimhae TWR  Daegu APP  Jungwon APP  Gimpo ACC Gimpo APP Gimpo TWR					PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC  PSR + SSRmAC PSR + SSRmAC PSR + SSRmAC		SMR  SMR, A-SMGCS      SMR SMR SMR, A-SMGCS
<b>SINGAPORE</b> Singapore ACC Singapore APP Singapore TWR					PSR + SSRmS + ADS-B + ADS-C PSR + SSRmS+SSRmAC	2	SMR, A-SMGCS
<b>SOLOMON ISLANDS</b>							
<b>SRI LANKA</b> Colombo ACC Colombo APP					SSRmAC + ADS-B + ADS-C PSR		ADS-C Trial
<b>THAILAND</b> Bangkok ACC Bangkok APP Bangkok TWR SVB TWR  Chiang Mai APP Chiang Mai TWR  Hat Yai APP Hat Yai TWR					PSR + SSRmAC + SSRmS PSR + SSRmAC + SSRmS  SSRmAC  SSRmAC + SSRmS	2	SMR, MLAT, A-SMGCS
Phuket APP Phuket TWR  Phitsanulok APP					SSRmAC + SSRmS  PSR		

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1	2	3	4	5	6	7	8
Phitsanulok TWR Hua Hin APP Hua Hin TWR U Taphao					PSR  SSRmAC		
<b>TONGA</b>					ADS-B		
<b>UNITED STATES</b> Alaska ACC  Hilo, Hawaii ACC Hilo, Hawaii APP Hilo, Hawaii TWR  Honolulu, Hawaii ACC Honolulu, Hawaii APP Honolulu, Hawaii TWR  Kahului, Hawaii APP Kahului, Hawaii TWR  Kokee, Hawaii ACC  Lihue, Hawaii APP Lihue, Hawaii TWR  Mount Kaala, Hawaii ACC  Pahoa, Hawaii ACC  Kunianiau, Hawaii ACC  Guam ACC  Mount Santa Rosa, Guam ACC Mount Santa Rosa, Guam APP Mount Santa Rosa, Guam TWR  Kona, Hawaii ACC					ADS-B + ADS-C  SSRmAC PSR  SSRmS PSR  PSR + SSRmAC  PSR  PSR + SSRmAC  PSR + SSRmAC  SSRmAC  SSRmAC  PSR + SSRmAC  PSR + SSRmS PSR + SSRmAC  SSRmAC		
<b>VANUATU</b>							
<b>VIET NAM</b> Hanoi ACC  Noibai APP Noibai TWR					PSR + SSRmAC + ADS-B  SSRmAC		SMR, A-SMGCS

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1	2	3	4	5	6	7	8
Ho Chi Minh ACC Danang APP Hanoi ACC Tansan Nhat APP Tansan Nhat TWR					PSR + SSRmAC + ADS-B +ADS-C  PSR  PSR		SMR, A-SMGCS