International Civil Aviation Organization

THE SEVENTH WORKING GROUP MEETING OF ATN IMPLEMENTATION COORDINATION GROUP OF APANPIRG (ATNICG WG/7)

Bangkok, Thailand, 29 January 2010

Agenda Item: Review Regional ATN Implementation Strategy

Strategy for Implementation of ATN in the Asia/Pacific Region

(Presented by Australia, China, India, Fiji, Hong Kong, Japan, Singapore and United States)

SUMMARY

This paper presents the proposed revision to the Strategy for Implementation of Aeronautical Telecommunication Network (ATN) in the Asia/Pacific Region that was further updated in the ATNICG WG/6 for consideration by the meeting. The proposed revision was to accommodate the developments that have taken place in the environment subsequent to adoption of the Strategy by APANPIRG/17.

1. **INTRODUCTION**

1.1   The 1st edition of the Strategy for implementation of ATN in the Asia/Pacific Region was developed by the Seventh Meeting of the ATN Transition Task Force (ATNTTF/7) to assist the Asia/Pacific States on ground-to-ground ATN implementation. It was adopted by APANPIRG/16 under Conclusion 16/29. It was also recognized that the strategy needs to be reviewed from time to time in light of developments and as required; amendments developed should be processed for review and adoption by APANPIRG.

1.2   The first amendment to the Strategy was proposed at ATNICG/1 meeting, in consideration of the progress in ACP's development work of the SARPs for IPS and the need to ensure harmonization of procedures and protocols. The amended Strategy permits the deployment of a network approach for the provision of dual stack (OSI and IPS) protocols and was adopted by APANPIRG/17 under Conclusion 17/21 (see Appendix 1). Subsequently, it was identified this Strategy should be reviewed for introduction of new developments such as ATN over IPS implementation in the Asia/Pacific Region. The Strategy was thus revised to include this new requirement by the Third Meeting of ATNICG. The recommended revised strategy was presented to APANPIRG/19 through CNSMET SG/12 (see Appendix 2).

2. **DISCUSSION**

2.1   In order to develop a common Strategy for the implementation of ATN in the region, the group sees the need to review the Strategy once again so as to merge the ATN over IPS implementation strategy with the ATN implementation strategy. A new version of the strategy (see Appendix 3), based on change proposals that were developed at the ATNICG/4 meeting and comments received subsequently, was developed at the ATNICG WG/6 meeting held in Hua Hin, Thailand in Sep 2009. The Strategy was modified in a way to more clearly differentiate the general Strategy from the specific requirements of States to implement the Strategy.

2.2   As a result, the updated Strategy for Implementation of the ATN in the Asia/Pacific Region has three sections: Considerations for the Strategy; a Description of the General Strategy; and State Requirements to Implement the Strategy:

a. The considerations for the Strategy includes the need for digital data communications, the availability of ICAO specification for ATN/OSI and ATN/IPS, the availability of supporting documentation, AFTN and AMHS terminal support, trials and demonstrations that have already been conducted, and the availability of equipment for ATN/OSI and ATN/IPS.

b. The general strategy for implementation of ATN in ASIA/PAC is to initially deploy a backbone network of ATN/OSI routers and MTAs as the basic infrastructure. The ATN/OSI routers will start with X.25 connections to one another but gradually migrate to IP. This however will not be over the Public Internet. Non-backbone MTAs may connect to backbone MTAs using either ATN/OSI or ATN/IPS. Backbone MTAs may likewise connect to MTAs in other regions using either ATN/OSI or ATN/IPS. The strategy does not require all states to implement MTA but rather permits the States to simply have Terminals which connect to MTAs in other states. These connections may be via the Public Internet provided appropriate security provisions are in place. The longer term strategy of the region is to convert all AFTN systems to AMHS, and eventually transition completely to ATN/IPS for AMHS.

c. The Strategy for Implementation of the ATN in the Asia/Pacific Region contains specific implementation requirements for the States. All implementations must be in compliance with ICAO standards and APANPIRG documents. Specific requirements for backbone systems, non-backbone systems to interconnect are identified as are requirements for connections to other regions. States are also required to work co-operatively to implement the ATN expeditiously and ensure system inter-operability, and provide appropriate training to the personnel for ATN implementation.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to consider the updated ATN implementation strategy proposed by ATNICG WG/6 and make comments/changes as required. Subject to the consensus/agreement of the meeting, the updated Strategy will be recommended for adoption by APANPIRG at ATNICG/5.

<div align="right">**APPENDIX 1**</div>

**STRATEGY FOR IMPLEMENTATION OF THE AERONAUTICAL
TELECOMMUNICATION NETWORK (ATN) IN THE ASIA/PAC REGION[1]**

Considering that:

a) the requirement for a robust ground-to-ground Aeronautical Telecommunication Network (ATN) to meet growing need for a digital data communications to support the Air Traffic Management Operational Concept;

b) the availability of ICAO SARPs and Technical Manuals for implementation of ATN;

c) the awareness generated in States for replacement of the present AFTN with digital data network by conducting various seminars and meetings;

d) the availability of several guidance materials, interface control documents (ICDs) required to assist States to ensure harmonization of procedures and protocol to assure inter-operability within the region;

e) the agreement in EUR region and North American region to provide gateways to support ATN protocol suites implemented in adjacent region;

f) the feasibility of introducing SARPs compliment air-ground application in a secured network without prolonged delay;

g) work in progress in ACP of IPS SARPs development for ground-to-ground communications and study undertaken on the feasibility of air-ground IPS;

h) the need to migrate to Binary Universal form of representation of meteorological data (BUFR) coded OPMET messages; the emerging need to use lower case letters in NOTAM messages;

i) the trial and demonstrations conducted by several States in the ASIA/PAC region for implementation of ATN/AMHS and actions taken by States for introduction of ATN/AMHS; and

j) availability of equipment and readiness of vendors to support provisions of equipment for both OSI/IPS ground-to-ground and OSI air-ground communications.

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[1] Version adopted by APANPIRG/17 under its Conclusion 17/21

THE GENERAL STRATEGY FOR THE IMPLEMENTATION OF THE ATN INFRASTRUCTURE AND ASSOCIATED ATN APPLICATIONS IN THE ASIA/PAC REGION SHOULD BE AS FOLLOWS:

a) implementation be in full compliance with Annex 10 SARPs, PANS, ICDs and guidance materials adopted by APANPIRG;

b) in the ASIA/PAC region ground-to-ground ATN will initially support the implementation of ATS Message Handling System (AMHS) to replace AFTN;

c) strategically deploy backbone ATN routers to provide fault tolerant infrastructure to initially support ground-to-ground applications and eventually support air-ground applications;

d) during the transition phase, some AFTN system may remain in operation. A reasonable time frame should be established for their replacement with AMHS;

e) MTA sites should provide AFTN/AMHS gateways during the transition phase;

f) States should work co-operatively to assist each other on a multinational basis to implement the ATN expeditiously and to ensure system inter-operability;

g) States should organize training of personnel to provide necessary capability to maintain and operate the ground-to-ground ATN infrastructure and applications;

h) upon successful deployment of ground-to-ground ATN infrastructures and applications within the region, States gradually introduce ATN air-ground infrastructures and applications; and

i) Strategically deploy network approach that permits dual stacks protocols (OSI/IPS) operations.

APPENDIX 2

REVISED STRATEGY FOR IMPLEMENTATION OF THE AERONAUTICAL TELECOMMUNICATION NETWORK (ATN) IN THE ASIA/PAC REGION [2]

1. All States having Backbone Boundary Intermediate System (BBIS) in the Asia/Pacific Region should continue to implement ATN/OSI as per the current regional plan (FASID Tables CNS-1B and CNS-1C);

2. For States with Boundary Intermediate System (BIS), deployment of IPS based AMHS and/or inter-State ATN circuits may be considered depending on the impact on the regional ATN network connectivity and redundancy, and the agreement with the adjacent States;

3. For AFS interface to adjacent regions, communication with States with only one connection to the APAC region can use IPS on a bilateral basis. States in adjacent regions that have multiple connections to the APAC region are recommended to continue to support ATN/OSI links;

4. The region should construct an effective regional ATN ground network that supports both OSI and IPS based services. This could be achieved by upgrading inter-State circuits to support IPS as well as OSI communication, and introducing IPS routers alongside BIS routers;

5. Any subsequent new services or AMHS Message Transfer Agent (MTA) should be able to support dual stack to assist future transition to "ICAO compliant" IPS network technology; and

6. The ATNICG task list shall be revised to include development of IPS implementation documentation.

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[2] Version presented to APANPIRG/19

**STRATEGY FOR IMPLEMENTATION OF THE
AERONAUTICAL TELECOMMUNICATION NETWORK (ATN)
IN THE ASIA/PACIFIC REGION**

Considering:

1) the requirement for a robust ground-to-ground Aeronautical Telecommunication Network (ATN) to meet the growing need for digital data communication to support the Air Traffic Management Concept;

2) the availability of ICAO SARPs and technical manuals based on the OSI Protocol Suite (ATN/OSI) and the Internet Protocol Suite (ATN/IPS);

3) the availability of AMHS Transition and Implementation guidance materials required to assist States to ensure harmonization of procedures and protocols and thereby assure inter-operability within the region;

4) the need to support States currently using AFTN terminals for communication with other States, and the need to replace these aging terminals with ATS Message User Agents;

5) that several States in the ASIA/PAC region have conducted trials and demonstrations for implementation of AMHS and have taken actions for introduction of AMHS; and

6) the availability of equipment and readiness of vendors to provide equipment for both ATN/OSI and ATN/IPS ground-to-ground and ATN/OSI air-ground communications.

THE GENERAL STRATEGY FOR THE IMPLEMENTATION OF THE ATN INFRASTRUCTURE AND ASSOCIATED ATN APPLICATIONS IN THE ASIA/PAC REGION IS AS FOLLOWS:

a) strategically deploy a backbone network of ATN/OSI routers and MTAs to provide a reliable infrastructure to initially support ground-to-ground applications and the planned ATN/OSI air-ground applications;

b) gradually migrate ATN/OSI backbone routers from X.25 sub-network connectivity to IP sub-network connectivity using the IP SNDCF feature of ATN/OSI routers;

c) implement IP sub-network connections among backbone and non-backbone routers as a private network, i.e., without connection to the Public Internet;

d) permit non-backbone States to connect to backbone States using either ATN/OSI routers and MTAs, or IP routers and MTAs;

e) permit backbone States with connections to States in other regions to connect using either ATN/OSI routers and MTAs, or IP routers and MTAs on a bilateral basis;

f) permit States with limited AFTN or AMHS connections to other States to connect to MTAs in other States rather than operate their own MTAs;

g) permit States with limited AFTN or AMHS connections to other States to connect terminals to MTAs in other States using the Public Internet but with appropriate security provisions for access control;

h) within a reasonable time frame convert all AFTN systems to AMHS; and,

i) eventually operate AMHS applications only with IP routers and MTAs.

IN ORDER TO ACHIEVE THE ABOVE STRATEGY THE FOLLOWING IS REQUIRED OF STATES IN THE ASIA/PAC REGION:

j) States shall provide implementations in compliance with Annex 10 SARPS and ICAO Manuals, and with the Plans, Policies, and AMHS Transition and Implementation guidance materials adopted by APANPIRG;

k) States having Backbone Boundary Intermediate Systems (BBIS) shall implement MTAs that support both ATN/OSI and ATN/IPS;

l) States having BBIS shall implement ATN/OSI routing with X.25 sub-network capability and optionally with IP sub-network capability for interconnection with other BBIS;

m) States having BBIS that connect to States in other regions shall provide high availability connections (e.g., with redundant physical connections);

n) States having Boundary Intermediate Systems (BIS) shall implement ATN/OSI MTAs, or ATN/IPS MTAs, or dual-stack MTAs;

o) States shall work co-operatively to assist each other on a multinational basis to implement the ATN expeditiously and to ensure system inter-operability; and

p) States shall organize training of personnel to provide necessary capability to maintain and operate the ground-to-ground ATN infrastructure and applications.