International Civil Aviation Organization

FOURTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP OF APANPIRG (CNS/MET SG/14)

Jakarta, Indonesia, 19 – 22 July 2010

Agenda Item 3: **Aeronautical Fixed Service**

2) discuss other AFS related Issues

CLARIFICATION OF DOC 9896 INTERNET PROTOCOL SUITE IPV6

(Presented by the United States of America)

SUMMARY

The ATNICG/5 discussed the implementation issues related to transition from ATN/OSI to ATN/IPS environment as specified in ICAO Doc 9896 Internet Protocol Suite Technical Manual. It concluded the following issues need to be clarified before a regional implementation plan can be developed: publication of ICAO Doc 9896, Edition 2; IPv6 address block assignment; VoIP performance; and status of industry Request for Comment (RFC) referred in ICAO Doc 9896. The ATNICG/5 recommendation by its members to have its chairman report to APANPIRG/21 through CNS/MET SG/14 requesting a more thorough clarification from ICAO Air Navigation Commission Panel.

This paper relates to:

Strategic Objectives:
D. Efficiency – Enhance the efficiency of aviation operations

Global Plan Initiative:
GPI – 22 Communication infrastructure

1.0 Introduction

1.1 The ATN Standard and Recommended Practices (SARP) were developed in 1990s and were published as ICAO Doc 9705, Edition2.

1.2 The ICAO Doc 9705, Edition 3 was published in early 2000s and has been adopted by APANPIRG for implementation in the region. All major hub States in the region have completed procurement of the equipment and are in the process of interfacing with one another.

1.3 The ICAO Doc 9880 ATN/OSI Technical Manual was developed and published in 2008 to supersede ICAO Doc 9705, Edition 3. However, the material in ICAO Doc 9705, edition 3 has not been completely transferred.

1.4 The first edition of ICAO Doc 9896 ATN/IPS which contains three parts: (1) Technical Manual, (2) Application, and (3) Guidance Material and was published in 2008.

1.5 The second edition of the ICAO Doc. 9896 was scheduled to be published by May 2010 per report of the Third ICAO Aeronautical Telecommunication Panel Working Group held in Montreal, Canada from 18-22 January 2010 [What is the status of this?].

2.0 Discussion

2.1 The ATNICG/5 reviewed the report from the third ACP WG of the Whole held in January 2010 which discussed the implementation issues imbedded in ICAO Doc 9705, ICAO Doc 9880 and ICAO Doc 9896.

2.2 The ATNICG has been able to support the transition from ICAO Doc 9705 to ICAO Doc 9880 with the exception of using the IPV6 addresses. The ICAO Doc 9896 is developed using reference to Industry RFCs has posed a challenge to track and interpret the stated specific requirements.

2.3 The ATNICG/5 has proposed the following issues to be reviewed and provide further clarification to support the transition to IPS environment:

2.3.1 ICAO Doc 9896 ATN/IPS Technical Manual, Applications and Guidance Material

a. The availability of Edition2 has been announced for May 2010 by the ACP WG W but has not been published. This causes member States and industry to defer their planning to support IPS environment.

b. The Guidance Material of ICAO Doc. 9896 has not been developed. This document is critical to address the compatibility between referred RFCs and existing ATS applications and networks. The unavailability of Guidance Material would have potential of network incompatibility between regions.

2.3.1.1 Recommendation:

2.3.1.1.1 ATNICG/5 recommends the following:

a. Provide a firm publication date for ICAO Doc. 9896, Edition 2 before implementation issues can be addressed.

b. Publish the Guidance Material of ICAO Doc. 9896 to provide guidance to sustain existing service while transitioning to an IPS environment. The regular tracking and verification of referred RFCs need to be performed and reported.

2.3.2 The use of VoIP in ICAO Doc 9896

a. The voice service is used between adjacent FIRs to coordinate air traffic activity. It is not considered a network designed for communication among States outside adjacent FIRs.

b. The voice service is required between adjacent FIRs where voice service cannot be re-routed, therefore dedicated circuits/channels are required. This means a voice compression technique is required to save on bandwidth and to provide acceptable QoS to users.

c. The voice service performance is depended on the available transmission media between adjacent FIRs (e.g., satellite service in South American and Caribbean, Alaska, and Pacific). This means the compression rate and QoS are different than landline or undersea cable circuits.

d. The conversion between existing analog based voice signaling (e.g., DTMF, Automatic Ring Down) to VoIP should also be considered.

2.3.2.1 Recommendation:

2.3.2.1.1 ATNICG/5 recommends the ICAO to consider the use of VoIP as a local issue. The ICAO Doc 9896 should specify encouraging the use of VoIP but not the technical data such as compression rate, QoS, or the use of the IP network.

2.3.3 The reference of RFC s in ICAO Doc 9896.

a. The reference of many RFCs in the document without identifying specific paragraphs would result in different interpretation of the requirements and options. This may well cause incompatibility and wasteful use of funds.

b. The RFCs can be changed or superseded by industry without notice. This would result in un-verified requirements or options.

c. The RFCs are developed and implemented by industry. Some RFCs are proposed but not implemented. This would lead to a great deal of confusion.

d. The ICAO Doc 9896 refers only to RFCs. This would require States to develop Product Specifications without reference to ICAO Doc 9896. The States would have to verify each of referred RFCs for its technical parameters and options as well as its availability. This is a time consuming process.

2.3.3.1 Recommendation:

2.3.3.1.1 ATNICG/5 recommends Asia/Pacific Region concentrate its activities to implement ATN/IPS based on ICAO Doc 9880 and ICAO Doc 9705, Edition 3.

2.3.4 Regional IPv6 address block assignment

a. The ICAO Doc 9880 and ICAO Doc 9896 recommend the use of IPv6 address.

b. States are required to obtain IPv6 address assignment from either Local Internet Registry (LIR) or Internet Assigned Number Authority (IANA). This requires States to enter into contract to LIR, with recurring payment, to secure IPv6 address assignments.

c. States who have obtained IPv6 address assignment from LIR are required to make recurring payments or face losing the assigned IPv6 address. This may cause the network to become inoperable.

d. States in the region should create an entity to obtain IPv6 address to ensure the same prefix is assigned to all States in that region.

e. EuroControl has obtained a block of IPv6 address assignments for the European Region.

f. States in the region using an IPv4 address for its private network do not pay for its address assignment.

2.3.4.1 Recommendation:

2.3.4.1.1 The ATNICG/5 recommends that ICAO Air Navigation Commission coordinates with EuroControl for sharing IPv6 address assignment to all regions. This will ensure future global network protocol compatibility.

3. Action required by the Meeting

3.1 The meeting is requested to review the four recommendations indicated in section 2 above and forward them to APANPIRG for appropriate action.

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Acronyms

ACP	Aeronautical Communication Panel
AIDC	Air Traffic Service (ATS) Inter-facility Communications Data
AFTN	Aeronautical Fixed Telecommunication Network
AFS	Aeronautical Fixed Services
AMHS	Air Traffic Service Message Handling System
APANPIRG	Asia Pacific Air Navigation Planning and Implementation Regional Group
ATN	Aeronautical Telecommunication Network
ATNICG	Aeronautical Telecommunication Network Implementation Coordination Group
ATNP	Aeronautical Telecommunication Panel
ATS	Air Traffic Service
DTMF	Dual-Tone Multi-Frequency
FIR	Flight Information Region
FMTP	Flight Management Transfer Protocol
HTML	Hyper Text Mark-up Language
IANA	Internet Assigned Number Authority
ICAO	International Civil Aviation Organization
IP	Internet Protocol
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
IPS	Internet Protocol Suite
LIR	Local Internet Registry
OSI	Open System Interface
QoS	Quality of Service
RFC	Request For Comment
VoIP	Voice-over-Internet protocol
XML	Extensible Markup Language