



Coordination meeting of the ATN ground-ground and ground-air applications project

Lima, Peru, 19 to 20 May 2010

Agenda Item 1: Review of the ATN CAR/SAM Planning / Implementation Activities

ICAO ATN-related guidance Material Development

(Presented by the ICAO Secretariat)

SUMMARY	
This paper provides a summary on the current status of the guidance material related to the implementation of the ATN and the future works being developed by ICAO on this documentation.	
References:	
<ul style="list-style-type: none">• Doc 9705 Manual of technical provisions for the ATN;• Doc 9880 Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols;• Doc 9896 Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols; and• Fifth ATN /TF meeting (Mexico City, Mexico, 12 to 13 June 2009).	
ICAO strategy objective:	<i>D - Efficiency</i>

1. Introduction

1.1 The Fifth Meeting of the ATN TF (ATN TF/5) was held in Mexico City from June 12 to 13 2009. Since that date several updates and new information has been developed by ICAO for the States guidance and support on the implementation of the Aeronautical telecommunications Network.

Current status of documents 9705 Manual of technical provisions for the ATN and 9880 Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols

1.2 Doc 9880, currently in its an advance unedited version, has replaced the “*Manual of technical provisions for the Aeronautical Telecommunication Network (ATN)*”, Doc 9705 – third edition. These amendments were necessary as a result of ongoing validation, and operational experience gained during implementation of elements of the ATN:

Doc 9880	Doc 9705
Part I Air-ground applications	Sub-Volume II
Part II Ground-ground applications	Sub-Volume III

Doc 9880	Doc 9705
Part III Internet communications service, including upper layer communications service	Sub-Volumes IV and V
Part IV Directory service, security services, systems management, Identifier registration and definitions	Sub-Volumes I, VI, VII, VIII and IX

1.3 Doc 9880 contains the detailed technical specifications for the ATN, based on relevant standards and protocols established by the International Organization for Standardization (ISO) and the Telecommunication Standardization Sector of the International Telecommunication Union (ITU-T) for Open Systems Interconnection (OSI).

Doc 9896 Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols

1.4 This manual, currently available in its 1st edition 2010 version, addresses detailed technical specifications for the ATN. This manual together with the ATN/IPS SARPs are based on standards developed by the Internet Society (ISOC) for the Internet Protocol Suite (IPS) and make reference to the RFCs (Request for Comments) developed by the Internet Society's Internet Engineering Task Force. It contains the provisions for ATSMHS over TCP/IP, specifying an IP version 6 network services.

1.5 The Manual is divided into three main parts. Networking, Applications and Guidance Material:

- a) The Networking Part includes the material compatible with on-going implementations. It includes specifications or appropriate references for the Networking Protocols, provisions for mobility management, provisions for security such as IP-Security and SSL or TLS.
- b) The Part on Applications includes provisions for an IPS implementation of applications which have already been implemented with the ATN/OSI. This includes provisions for AMHS over IPS, by means of RFC2126 or 1006.

The other ATN/OSI application which has been implemented to date is air-ground CPDLC. The necessary provisions on Context Management, Mobility, Security and such, to provide a generic IPS methodology for use by Air-Ground datalinks; has been included.

AIDC/OSI (Doc 9880, Part IIA) is currently not planned for implementation in the ATN/IPS environment. OLDI/FMTP is being considered as an alternative.

- c) The Part on Guidance Material includes implementation guidance in particular on issues such as:
 - Connection oriented or connectionless usage
 - Transport layer addressing
 - Multicast services
 - AS numbering and addressing schemes
 - IP version 4 to IP version 6 migrations and translation
 - Inter-domain routing and Quality of Service Management.

- Voice over IP material has been included by reference to the material developed by EUROCAE Documentation (for example ED 136, ED 137, ED 138)

Future Work on ICAO ATN Guidance Material

1.6 The ATN SARPs updates and development is developed by the ACP Panel under WG-I. The WG-I has finished work on the basic standards however they must now work on guidance material, ie; how to put together and manage a functioning network which meets aviation's needs. Although ICAO Doc 9896 completion sets the foundation for the new generations of ATM based on IPS, there exist several implementations issues that will require follow-on standardization efforts to ensure ATN interoperability between ANSPs and Regions. These should include but may not be limited to:

- a) The acquisition of a very large IPv6 address allocation from ICANN for sub-allocation by ICAO to the ANSP's for use in their individual IPS networks to ensure a consistent global ATN infrastructure.
- b) Network Architecture Design Guidance for the IPS (IPv6) network, including regional addressing assignment, subnet addressing, aircraft addressing, routing infrastructure, routing protocol, network segmentations, regional interconnect designs, etc.
- c) Public Key infrastructure (PKI) and IPSec Implementation guidance to insure that the key fields are formatted and used consistently, which is necessary for the interoperability of authentication and security services between ANSPs and regions.
- d) The definition of a consistent Aircraft and Ground System Naming/Identity for PKI use as the authentication identifier.
- e) The definition of an Aircraft and Ground System IPS Domain Name System structure for both the aircraft and ground systems. This should also include the required design guidance for "ATN Root Name Server" infrastructure to be setup between the ANSPs.
- f) IPS DNS Implementation Guidance for interfacing the "ATN Root Name Servers", for implementing DNSSec both within and between ANSPs, the creation of "service names", and IPv4/IPv6 resolution services.
- g) IPv4 - IPv6 Transition Guidance to ensure that a minimal set of transition services are supported to minimize interoperability problems and to ensure that supported transition services are implemented similarly between ANSPs/regions.

1.7 Regarding VoIP, the ACP is considering other updates for the current provisions in Doc 9896, coming from other industry standards as RTCA from the United States, since the only VoIP standards available on Doc 9896 were from EUROCAE.