



International Civil Aviation Organization

Fourth ATN Transition Task Force Meeting

Mumbai, 8-12 April 2002

Agenda Item 3: Review ATN technical documents and transition issues

**CHECKLIST FOR IMPLEMENTATION OF GROUND/GROUND
NETWORK INFRASTRUCTURE**

(Presented by Japan)

SUMMARY

This paper presents the draft Checklist for review by the meeting.

1. Introduction

1.1 Implementation of ATN infrastructure is a complicated issue and the implementation procedure needs to be developed to provide necessary guidance to States.

2. Discussion

2.1 In order to provide assistance to States in implementation of ATN related infrastructure in the region, based on the experience gained in conducting trials and demonstrations with neighbouring States, the draft checklist for implementation of ground/ground ATN Network Infrastructure has been prepared and provided in at the attachment.

3. Action by the Meeting

3.1 The meeting is expected to:

- 1) review the checklist provided in Attachment;
- 2) propose changes as required; and
- 3) consider adoption of the checklist for use by States.

Draft Checklist for Implementation of Ground/Ground ATN Network Infrastructure¹
Phase I: Initial Network Deployment for Ground/Ground Applications

No.	Items to check	References	Remarks
1.	Establish ATN Implementation Team (AIT). Designation of Programme/Project Manager and required staff. Secure funding support.		AIT membership may include representatives from: - CAA/ATS Service provider(s); - Operations and engineering units; - Industry; - Airlines; - Aeronautical communication service provider(s); - Telecommunication service providers
2.	State Plan. Develop a phase plan with target date for the implementation of ATN infrastructure based on the regional planning documents and the ATN Standards and Recommended Practices (SARPs) and Guidance Material. Secure budget to support: - Trials/demonstrations, - Phased implementation, - Human resources and training.	ANNEX 10 Vol. III - Doc. 9705-AN/956 <i>Manual of Technical Provisions for the ATN</i>; - Doc. 9739-AN/961 <i>Comprehensive Aeronautical Telecommunication Network Manual</i>; Table CNS –1B of ASIA/PAC FASID ASIA/PAC Region ATN Transition Plan.	Edition 2 of Doc. 9705.

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3.	Determine network architecture, policy. Consider factors such as: (a) Redundancy (no single point of failure); (b) Status and position within the regional ATN network; (c) Number and type of intra-State facilities to be connected (ATS, AOC, <i>etc.</i>); (d) Site geographical locations; (e) Security, availability, integrity (Quality of Service) requirements (depending on application type); (f) Projected circuit loadings <i>vs.</i> capacity of existing circuits; (g) Router loading; which will determine: - network topology, type and media, - network infrastructure requirements, - intra-State routing domains (AOC, ATS <i>etc.</i>) and routing policies	Interface Control Documents (ICDs) for ATN End Systems. Asia/Pacific Regional ICD: ATN Ground-Ground BIS Router. Asia/Pacific ATN Routing Architecture Plan. Asia/Pacific ATN Addressing Plan Table CNS –1B of ASIA/PAC FASID ASIA/PAC Region ATN Transition Plan.	(a) May require multiple routers at each network node and divers connectivity between nodes. (b) Backbone sites have greater requirements for availability and throughput. (c) Will AOCs be permitted access to the ATN backbone through ATS routers? (d) Affects network topology, choice of subnetwork, physical communications medium/media. (e) QoS and Security issues influence use of communications service provider, public network/leased line <i>vs.</i> dedicated private connection, <i>etc.</i> (f) Determine bandwidth requirement, including growth capacity (g) Avoid “choke points” that place excessive load on a single node. Local network deployment may use ATN BIS, ATN IS or OSI IS routers. Choice of router type depends on cost, capability, suitability for application requirements (aeronautical grade <i>vs.</i> commercial communications grade) <i>etc.</i> Commercial network simulation packages can help analysis of network performance under normal and abnormal conditions
	Develop ATN address allocation plan. Designate responsible agent for administering address allocation and registration of addresses with ICAO.		
4.	Equipment Acquisition and Evaluation. Conduct laboratory tests with proposed BIS, IS and ES to ensure connectivity and performance. Begin deployment at different network sites as tests proceed, and pre-operational testing.	ICDs.	Equipment Protocol Implementation Conformance Statements (PICS) can help evaluation of equipment compatibility and can assist in creating ICDs. Verify network performance: throughput, effects of failures <i>etc.</i>

5.	Inter-State ATN router inter-connection. Coordination with States concerned for agreement on implementation of inter/intra regional connections including technical interface, routing policy and target dates. The following aspects should be considered: - Applications to be supported. - Capability to support air/ground applications. - Use of existing circuits. - Connectivity and integrity. - Security. - Alternate routing capability. - System reliability. - QoS. - Capacity and predicted load demand.	Asia/Pacific Region ATN Transition Plan. Asia/Pacific ATN Routing Architecture Plan. Asia/Pacific ATN Addressing Plan Asia/Pacific Regional BIS Router ICD. Applicable ES ICDs.	For AMHS, there is no need to provide two separate physical lines to support existing AFTN service and to introduce new AMHS circuit, as both requirements can be satisfied using one physical link given adequate capacity and QoS.
6.	AMHS inter-connection. - Provide AMHS/AFTN gateway while transitioning between AFTN and AMHS; - Follow the ASIA/PAC AMHS naming convention, detail arrangements for AMHS naming plan for MF-Addressing and XF-Addressing Scheme; - Register all PRMDs with ICAO Regional Office; - Conduct close coordination with States concerned. - Establish date for phasing out of AFTN connections, once sufficient route diversity has been established in ATN network.	- PRMD value shall be selected as prescribed in Doc. 9705.	Inter- and intra-regional connections should be based on bilateral agreements and in compliance with AMHS SARPs, technical specification and ICD.

List of Abbreviations:

AFTN	Aeronautical Fixed Telecommunication Network
AMHS (ATSMHS)	ATS Message Handling System
ATN	Aeronautical Telecommunication Network
ATS	Air Traffic Service
BIS	Boundary Intermediate System
ES	End System
FASID	
ICD	Interface Control Document
IS	Intermediate System
PICS	Protocol Implementation Conformance Statements
SARPs	Standards and Recommended Practices

List of References:

[1]	ICAO Annex 10 Volume III, DOC. 9705-AN/956 <i>Manual of Technical Provisions for the Aeronautical Telecommunications Network</i>	Edition 2
[2]	ICAO Annex 10 Volume III, DOC. 9739-AN/961 <i>Comprehensive Aeronautical Telecommunication Network Manual</i>	
[3]	Asia/Pacific Regional Interface Control Document (ICD): ATN Ground-Ground Boundary Intermediate System (BIS) Router	Draft rev. 1.1 (not yet approved)
[4]	Asia/Pacific FASID	
[5]	Asia/Pacific Region ATN Transition Plan.	
[6]	Asia/Pacific ATN Addressing Plan	
[7]	ATN Routing Policy for Asia/Pacific Region.	Draft (not yet approved)
[8]	Asia/Pacific ATN Routing Architecture Plan.	
[9]	AMHS ICD in Asia/Pacific Region	Final Draft (To be approved at Mumbai ATNTTF)

¹ This document comprises a checklist for the deployment of an ATN Ground Network to support initial ground-ground ATN applications, notably ATSMHS/AMHS, based on the Standards and Recommended Practices (SARPs) specified by Edition 2 of ICAO Doc. 9705-AN/956.