



International Civil Aviation Organization

**Fifth Meeting of Aeronautical Telecommunication Network (ATN)
Transition Task Force of APANPIRG**

Phuket, Thailand, 9 – 13 June 2003

Agenda Item5: Review the development of guidance material for the use of IP as a Sub Network for the ATN.

Status on the Guidance Material for IP as a Sub Network for the ATN

(Presented by the Rapporteur of the ATNTTF Ad Hoc Working Group)

SUMMARY

This Working Paper presents the outcome of the ATNTTF Ad Hoc Working Group deliberations in the development of guidance material for the Internet Protocol (IP) to be used as a Sub Network for the ATN.

1. Introduction

This paper outlines the concerns raised by the ATNTTF Ad Hoc Working Group in determining the best course of action in carrying out this activity.

2. Background

At the fourth ATNTTF meeting the task force assigned a task to develop guidance material that will provide information that will allow the protocol TCP/IP to be used as a sub network to the ATN. This task was assigned to the ATNTTF Ad Hoc Working Group to develop the guidance material.

3. Discussion

During the ATNTTF Ad Hoc Working Group sixth meeting it was noted that the IP protocol was raised at the 4th meeting of the Joint Working Group of the ATNP. At that meeting the ATNP developed Flimsy 2 Rev. B (approved): Guidance provided by ATNP on "AMHS over TCP/IP". This document outlines the panel's position and is attached as Appendix A to this working paper. In essence the paper outlines that the ATNP believes that the use of the TCP/IP protocol is a local/regional matter and will only provide guidance where necessary as it monitors related developments in this matter.

However with the disbandment of the ATNP and its activities now assigned to the Aeronautical Communications Panel (ACP), it is the ATNTTF Ad Hoc Working Group decision that before the Asia Pacific region begins to work through this issue, that the region waits to see whether or not the ACP Working Group N will provide further directions and guidance material in the use of the TCP/IP protocol and whether it should include it as part of the ATN Internet Communication Services.

It would appear that in other regions such as Europe which has indicated a greater desire to use the protocol that pressure will be applied for the ICAO ATN SARPs to develop the appropriate information to allow use of the TCP/IP protocol stack.

4. Recommendation

Due to the uncertainty on whether or not the TCP/IP protocol will be addressed on a global scale or whether it will remain a local and or regional issue, the ATNTTF Ad Hoc Working Group recommends that the ATNTTF placed on hold any further work in developing its own guidance material until further information is forth coming from the ACP Working Group N.

It is also recommended that if administrations within the Asia Pacific region wish to pursue the implementation of the TCP/IP subnet as part of the ATN, they should be able to do so through bilateral agreements on the understanding that they may be required to make changes to their subnets if and when the TCP/IP subnet is developed as part of the ATN SARPs.

5. Action by the Meeting

The meeting is requested to note the concern of the ATNTTF Ad Hoc Working Group in actioning this task.

The meeting is requested to discuss these concerns and to determine the best course of action in whether the task should be deferred until further direction is forth coming from the ACP Working Group N.

Appendix A: Flimsy 2 Rev. B (approved): Guidance provided by ATNP on "AMHS over TCP/IP"

It has been observed that some States or even Regions are implementing or planning to implement AMHS systems making use of lower communication layers that are not conformant to the ATN Internet Communication Services (ICS). Such AMHS systems conform to Doc 9705, Sub-Volume III, Chapter 1, with the exception of the clauses related to interfacing with ATN ICS. The most frequent occurrence of such non-compliant systems is related to AMHS systems making use of TCP/IP lower layers through a RFC1006 interface ("AMHS over TCP/IP").

Due to the store-and-forward nature of the AMHS, this can be done without compromising the end-to-end interoperability at the AMHS application layer with SARPs-compliant AMHS implementations, but at the cost of some dual-stack systems¹ for lower layers. Strict conformance to Doc 9705, Sub-Volume III, Chapter 1 is required, with the only exception of clause 3.1.2.2.1.2 ("Use of Transport Service"), to ensure such end-to-end interoperability.

The reasons invoked by States adopting such local policies include the following:

- The need for an immediate or short-term transition from existing ground networks, and in particular from X.25 networks that are reaching obsolescence;
- The use of a common ground network infrastructure shared with other ground applications, such as radar data distribution or inter-centre communications (such as OLDI in Europe), such infrastructure being sometimes already in operation.

It should be noted that in all known cases, the IP network used or planned to be used is a network infrastructure in which switching equipment and links are dedicated to ATS communications, building a so-called "private" IP network.

It is recognized that other transition strategies can also be developed, that make use of the proposed IP SND CF to enable IP sub-networks to be used as ATN sub-networks, in a fully SARPs-compliant ATN ICS architecture. However such an architecture is not discussed in the present document.

Despite the fact that the implementation of "AMHS over TCP/IP" can meet, as described above, the specific objectives of a State on a local or regional basis, the attention of implementers should be drawn to the fact that the implementation of two different architectures has the following drawbacks:

- It limits "any-to-any" communication between AMHS systems on a global basis that could be needed in specific cases, e.g. for performance requirements;
- it requires the implementation by some States of "dual-stack" AMHS systems, to gateway between AMHS systems using the ATN ICS and AMHS systems using TCP/IP. This may reduce performance and availability;
- The cost of such gateway facilities is expected to be borne by States implementing non SARPs-compliant AMHS systems.

In view of the elements above, the following guidance is offered by the ATN Panel on the use of "AMHS over TCP/IP":

1. "AMHS over TCP/IP" implementations should not be presented as fully SARPs-compliant ATN implementations.

¹ Such dual-stack systems are beyond the baseline ATN architecture which is specified by ICAO.

2. Non-SARPs-compliant "AMHS over TCP/IP" implementations are seen as a "local solution" within a State or Region. Inter-State or inter-Regional connections between such systems using TCP/IP should be subject to bilateral/regional agreements.
3. States or Regions that implement "AMHS over TCP/IP" systems within their domains are responsible for taking those necessary measures to ensure interoperability with SARPs-compliant implementations in other States or Regions.
4. Appropriate security measures should be taken when using an IP network, irrespective of whether AMHS uses TCP/IP directly or via the IP SNDCE.

The ATNP will continue to monitor related developments and will provide further guidance as appropriate.