



*International Civil Aviation Organization*

**FOURTH MEETING OF THE AERONAUTICAL COMMUNICATION SERVICE (ACS) IMPLEMENTATION CO-ORDINATION GROUP OF APANPIRG (ACSICG/4)**

Bangkok, Thailand, 16 - 18 May 2017

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Agenda Item 3: Review and update States' ATN/AMHS Implementation Status and discuss transition and operational Issues:

**AMHS IMPLEMENTATION STATUS OF NEW ZEALAND**

(Presented by Airways New Zealand)

**SUMMARY**

This paper presents a summary of the changes in the AMHS implementation status of New Zealand over the last year.

It also presents an update of other communications- and SWIM-related activities.

**1. INTRODUCTION**

1.1 New Zealand installed and operationally commissioned an AMHS system in 2012.

In 2015 Airways upgraded its whole network infrastructure to an IP-based MPLS network. This enabled many of the X.25 based AFTN connections to be converted to IP-based connections.

Airways provides an EXTERNAL Access (EXTA) Gateway designed to allow States (Pacific Islands) and external companies (e.g. airlines, airports and the NZ MetService) to connect to the New Zealand AFTN/AMHS system. This EXTA gateway is in need of lifecycle replacement.

**2. DISCUSSION**

2.1 IN the past year, conversion of X.25-based AFTN connections to IP-based connections has been ongoing, further reducing the dependency on legacy X.25 technology.

Domestically within New Zealand the only remaining X.25-based connections are to

the Airways ATM systems (Domestic and Oceanic).

Internationally, the remaining X.25-based AFTN connections will either be:

- Replaced directly with AMHS Connections (e.g. in the case of the NZ connection to Australia which will be replaced with an IP-based AMHS connection as part of the CRV pilot implementation), or
- Replaced with IP-based AFTN connections, which in turn will be replaced with IP-based AMHS connections over time.

- 2.2 A project has been initiated to convert the existing X.25 based AFTN connections used by the NZ Domestic and Oceanic ATM systems to IP-based AFTN connections.

IP-based AFTN connections to the ATM systems has been successfully tested in the Airways development environment.

Operational commissioning of IP-based AFTN connections to the ATM systems is scheduled for Q3 2017.

- 2.3 Following successful interoperability testing, an IP-based AMHS connection was commissioned operationally between New Zealand and the USA in June 2016.

This AMHS connection is used to exchange AFTN-based AIDC messages by effectively enclosing the AFTN-based AIDC messages in an AMHS ‘envelope’ for transfer between the two States. Despite the messages passing through an AFTN-to-AMHS gateway at the source and an AMHS-to-AFTN gateway as the destination, there has been no noticeable degradation in the end-to-end transfer times for the AIDC messages.

- 2.4 The Pacific Aeronautical Satellite Network (PASNet) which is a VSAT Aviation Communications network for the Pacific, was established in 2008 with an initial connection to Fuamotu (Tonga).

The World Bank Pacific Aviation Investment Programme (WB PAIP) is funding the extension of VSAT connectivity to a number of Pacific States in order to support voice, ADS-B and in some cases AFTN/AMHS. Phase 1 of this project is currently underway with the following progress with the deployment of VSAT remote stations:

- Faleolo (Samoa) – X.25 circuit replaced with a IP-based VSAT connection in April 2017. The AFTN connection via VSAT is proving to be much more reliable.
- Vava’u (Tonga) – VSAT connection established in early May 2017 (Voice, ADS-B and possible AFTN/AMHS).
- Funafuti (Tuvalu) - VSAT scheduled for installation in June (Voice and ADS-B)
- Tarawa (Kiribati) - VSAT scheduled for installation in August (Voice and ADS-B)
- Kiritimati Island a.k.a. Christmas Island (Kiribati) - VSAT scheduled for installation in August (Voice and ADS-B).

Phase 2 of the WB PAIP VSAT Deployment project is planned to provide connectivity to two or three sites in Vanuatu. No dates have been set for these yet.

The New Zealand Ministry of Foreign Affairs and Trade (MFAT) have provided funding VSAT stations for:

- Rarotonga Cook Islands),
- Aitutaki (Cook Islands), and
- Niue.

WB PAIP/PASO are expected to issue tenders for Vanuatu, Cooks and Niue in Q3/Q4 2017.

A PASNet VSAT connection may be established to Nauru in the future, with separate funding.

Work is underway to commission an IP-based VSAT connection to Fa'a'a (Tahiti) in French Polynesia (waiting on the service provider).

- 2.5 The EXTA gateway mentioned in Section 1.1 is due for lifecycle replacement. It has a number of limitations, e.g.
- Access has been limited to mostly AFTN/AMHS connections.
  - Establishing a new connection requires a significant amount of effort.

The new gateway to be commissioned to replace the EXTA gateway will be designed to allow:

- States and external companies to access a range of Airways operational systems and not just the AFTN/AMHS system.
- A range of protocols to be used for the connections (and not just AFTN/AMHS messaging).
- Easy and more efficient configuration of new connections.

The above design considerations will be an enabler for SWIM implementation, allowing Pacific Island States and companies within New Zealand (e.g. airlines, airports and the NZ MetService) to use the gateway to exchange data with Airways operational systems using not only AFTN/AMHS but also other interfaces such as Web Services.

- 2.6 Currently Airways operate their Domestic ATM system and AFTN/AMHS systems for a single operational centre in Christchurch, with Disaster Recovery systems (in 'hot standby' mode) based in Auckland. The 2010/2011 earthquakes in Christchurch resulted in the realization that it would be unrealistic to expect Christchurch-based staff to relocate to Auckland following a major disaster which prevents ATC and AFTN/AMHS operations from continuing from Christchurch.

Airways plan to transition to a ‘Single System – Two Centres’ mode of operation whereby the ATM system and ATC staff are split between Christchurch and Auckland, i.e. under normal operations both centres will be operational at all times.

Consideration is also being given to operating AFTN/AMHS systems (COM centres) in both centres. With the proposed CRV implementation, there will be separate IP-based connections into Christchurch and Auckland. This should eliminate a total NZ AFTN/AMHS outage even if there is a disaster which causes an outage in one centre, or a partial outage in the MPLS network. With this AFTN/AMHS operating scenario there should always be some level of AFTN/AMHS message exchange possible, both domestically and internationally

- 2.7 The NZ MetService has established a Disaster Recovery (DR) centre in Auckland. This DR centre uses a P3 AMHS connection to the Airways AMHS system. Following a period of interoperability testing the connection was deployed operationally in July 2016.

Plans have not yet been finalized by the MetService for the replacement of their main operational IP-based AFTN connection with an AMHS connection, but this will be scheduled in good time to allow the NZ MetService to comply with the requirements to support IWXXM by 2020.

- 2.8 Airways are collaborating with the NZ MetService to develop a system whereby Airways can request updates of Graphical MET data from the MetService via a RESTful API. This will initially be used to access Graphical SIGMETS, but will be extended over time to access other types of Graphical MET data.

A logical extension of the MetService’s API will be the provision of access to MET data in IWXXM format. This forms part of the SWIM planning being done by the NZ SWIM Working Group under the auspices of the NZ CAA’s ‘New Southern Sky’ initiative.

- 2.9 Airways have developed a smartphone App which is used by General Aviation (GA) pilots to access NOTAM and textual MET data. The App (called IFIS Mobile) supplements the existing Pre-Flight Briefing service provided by the Airways Internet Flight Information Service (IFIS) website. It enables GA pilots to access the latest NOTAM and MET data immediately prior to a flight, provided that they are at a location which has mobile coverage.

The IFIS Mobile App was commissioned operationally at the end of Q3 2016. Currently the App has in excess of 1500 registered users.

A Project has been raised to extend the App’s functionality to provide users with access to:

- Graphical SIGMETS.
- Area Forecasts (ARFORs) – initially as textual reports but to be extended to include Graphical ARFORs once the MetService make these available (Q1/Q2

2018).

- The ability to modify existing VFR/SARWatch Flight plans:
  - Modify the SARTIME (Scheduled date/time for the end of the flight, after which initial Search and Rescue operations are instigated).
  - Query a flight plan (generally to check the SARTIME).
  - Terminate the Flight Plan.

- 2.10 Airways provide a website for Unmanned Aerial Vehicle (UAV) operators in New Zealand. In addition to providing a wide range of UAV-related information, it provides UAV operators with the ability to request Provisional Authorisation for UAV operations in Controlled Airspace.

A RESTful API is being developed which will allow copies of Provisionally Authorised UAV flight plans to be forwarded 30 minutes prior to the scheduled start of the flight to the ATC tower which is associated with the controlled airspace in which the UAV flight is to be operated. This will result in a UAV flight progress strip being generated (either paper-based or as electronic flight strip).

Whilst the UAV operator will still be required to get final telephonic approval to operate the UAV, this will save the ATC staff from manually having to generate the flight strip – thus increasing safety and efficiency.

### **3. ACTION BY THE MEETING**

- 3.1 The meeting is invited to:

- a) Note the information contained in this paper; and
- b) Discuss any relevant matters as appropriate.

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