Fifth Meeting of the African Air Navigation Services Providers

(Lomé, Togo, 28 March - 1ˢᵗ April 2022)

Agenda Item 6: Implementation of ICAO Global and Regional Air Navigation Plans (GANP & AFI/ANP) and ANSPs priority areas of cooperation

WP/04/PPT-A: Concept of evolution of TELECOM infrastructures, networks and services

(Note submitted by ASECNA)

RESUME
The purpose of this working note is to outline the needs of a common IP based managed network service across the AFI region to take into account current and future developments of the CNS/ATM system in the AFI region, in accordance with ATN IPS standards and protocols.

REFRENCE(S)	Annexe 10, ASBU, GANP, GASP, Doc 8969 ("Manual for the ATN using IPS Standards and Protocols")

1.   INTRODUCTION

The global aviation system, which is one of the most complex and integrated information and communication technology (ICT) systems in the world, is undergoing a rapid and irreversible digital transformation characterized by the emergence of innovative space technologies and increased data exchange. Digitalization, the virtualization of operational systems and artificial intelligence are at the heart of operational activities, whose mastery of aeronautical Big Data is one of the crucial challenges in the short and medium term. The ATM system is inexorably evolving towards an ecosystem in which the aircraft connected to the CNS/ATM system, is part of a set of interconnected systems that consist of multiple on-board elements, ground systems, and terrestrial and satellite networks and infrastructures managed by ANSPs, telecommunications operators and industry.

To meet changing needs and technologies as well as external constraints and challenges, the AFI region must focus on the implementation of new service environments based on operational and security performance, built around TCP/IP networks and resilient IT

infrastructures, able to integrate, aggregate and synchronize operational data and metadata from various internal or external systems providing the data and metadata that contribute to the CNS/ATM and MET, but also to deliver related services such as the production of reliable statistics on performance levels provided in real time on critical systems in accordance with the requirements of the PBCS (RCP and RSP), but also to provide reliable input data to equally important related systems such as those relating to the invoicing of aeronautical charges, etc.

2   DISCUSSION

The ASBU modules and the future aeronautical services are based on IP protocols and require shared infrastructure. In the AFI region, to date, telecommunications support is essentially based on several low-speed aeronautical telecommunications VSAT networks, operating in the C-band, and interconnected with each other at the baseband level for conventional AFTN/AMHS or ATS/DS coordination links between adjacent centers.

ASECNA has migrated almost all its TCP/IP links for more than a decade and the migration of AFTN/AMHS links to TCP/IP is currently underway with adjacent networks including NAFISAT. In addition to the multifaceted coordination problems, the feedback highlights the growing bandwidth requirements required to convey certain data in XML format such as IWXXM, as an attached file, in accordance with AMHS procedures.

In addition, it is clear that the availability of spectral resources is becoming increasingly scarce. The protection of the aeronautical frequency spectrum is threatened. The exploitation of frequencies in the C-band increasingly coveted by IMT. The problems of cohabitation of aeronautical telecommunications with 5G are almost daily. The deployment of 5G must also make it possible to improve the competitiveness of companies, to develop innovation and meet the needs of the economies of our States, to access ever more efficient mobile services.

In this context of increasing pressure on the said band, it becomes more than crucial to actively support ICAO's position on the crucial points inscribed at the next World Radiocommunication Conference (WRC-23). These points include opposition to any adverse changes to the current regulatory provisions of the ITU Radio Regulations;

However, it is more necessary than ever for air navigation service providers to change the paradigm and make proactive and predictive commitments in the medium and long term, in order to ensure the continuity of aeronautical telecommunication services and taking into account not only the risks but also the opportunities offered by the evolution of operational needs induced by the rapid digital transformation of the CNS/ATM system, in order to evolve the telecommunications networks towards a new hydride but seamless ecosystem based on the deployment of appropriate technologies, in accordance with the requirements of high-speed connectivity, but also of secure management of associated aeronautical databases operating in environments of various inter-domain routing, and thus deliver the required services to users in accordance with the new performance

requirements required by the change of operating environments of CNS/ATM applications, built around the new concept of SWIM (Service Wide Information Management) and new communication and monitoring performance requirements (PBCS) associated with performance-based navigation (PBN). In the absence of certification, compliance with the above-mentioned required performance requirements may be integrated into the peer review mechanisms, in accordance with modalities to be defined.

In addition, to be effective, such a system must be designed in a systemic approach integrating all the related components of services required in terms of operational monitoring of network activities and performance and the overall security and safety threat of the operational information system, as well as the associated governance mechanisms, ultimately harmonizing procedures and working methods on the one hand, but also to share in a circle of trust the relevant information subsequent through periodic bulletins on cybersecurity and performance levels to the agreed minimum requirements. The aim is to set up, within the framework of shared responsibility, an effective operational monitoring mechanism on security and collective security, framed by non-disclosure agreements and memorandums of cooperation between the ANSPs concerned.

3   FOLLOW-UP TO BE GIVEN BY THE MEETING

The meeting is invited to:

1.   Take note of the contents of the present working note and make comments and contributions on the substantive issue raised.

2.   Actively support ICAO's position to oppose any adverse changes to the current regulations of the ITU Radio Regulations for the 3,600-3,800 MHz frequency bands that would negatively impact the operation of aeronautical fixed systems using the frequency in this and adjacent bands.

3.   Support the need for coordinated deployment of IP connectivity of ground-to-ground aeronautical ATN IPS networks, addressing safety issues and capable of supporting a reliable aviation infrastructure, deploying future services based on CNS/ATM and MET data management and governance, and easily interfacing with current or under development ATN IPS networks in other regions.

Conceptual scheme for harmonized exchange of aeronautical, meteorological and flight information for all ATM users and stakeholders in the framework of SWIM