INTERNATIONAL CIVIL AVIATION ORGANIZATION
Fourth Meeting of AFI Region Directors General of Civil Aviation (DGCA/4)
(Matsapha, Manzini, Swaziland, 8-9 November 2010)

Agenda item   4:   Air Navigation

4.2 Regional Strategies for Communications, Navigation and Surveillance (CNS) Infrastructure

PROPOSAL FOR THE IMPLEMENTATION OF COMPREHENSIVE
AFI REGIONAL CNS/ATM INFRASTRUCTURE AND SERVICES

(Presented by SITA)

SUMMARY
As an air transport community owned organisation (including the majority of airlines) SITA fully supports ICAO's initiative to expedite the implementation of sustainable and reliable air navigation service and infrastructure improvements in the AFI region. This working Paper highlights specific technological areas in which SITA could facilitate the realisation of improvements in the AFI region. These include the leveraging of SITA's experience in adopting the Pan-European Network Services (PENS) to AFI wide data communications network services and the deployment of ICAO defined CNS/ATM applications such as Centralised AIS data base and common AMHS/AFTN switch in AFI where required to overcome identified safety and efficiency deficiencies.

1.   **INTRODUCTION**

1.1   Established over 60 years ago by a group of eleven airlines as a not-for-profit organisation to deliver ground/ground data communications services SITA rapidly evolved to become a global organisation. Today with over 600 members from the air transport community including airlines, airports, aerospace and Global Distribution Systems (GDS) providers SITA's strategic direction is driven by this vast membership from the air transport community; a key element of which is to facilitate and support the deployment of reliable and sustainable air navigation infrastructure throughout the world.

(5 pages)

1.2   SITA has actively supported and contributed towards the standardisation, validation and implementation of ICAO recognised CNS/ATM technology. Today SITA provides VHF and satellite air/ground data link communications services to over 180 airlines and 60 Air Navigation Service Providers. Air/ground data traffic trend analysis demonstrate that data link communications in support of air traffic management are increasing on an average of 10% per annum confirming the value and benefits of this technology to airlines and air navigation service providers alike.

1.3   Following the introduction of SITA's VHF air/ground data communications service in 1984 and Satellite data communications service in 1991 the industry has witnessed exponential growth in the expansion and use of this service by the majority of the world's airlines for Airline Operational Communication (AOC) purposes.   Today SITA operates over 1,200 VHF data radios across the globe and delivers the satellite service via two Ground Earth Stations that provide access to INMARSAT geostationary satellites; the combined service is used on a daily basis by over 6,000 aircraft. Since the early 1990's a number of air navigation service providers pioneered the use of this service for the delivery of air navigation services including Digital-ATIS, Departure Clearances, ADS-Contract and Controller Pilot Data Link Communications (the latter two more commonly referred to as "FANS 1/A" in the industry).   Since then the deployment of these services has also grown exponentially as air navigation service providers and equipped airlines benefit from the performance of delivery (as compared to voice) and clarity of communications. Today SITA operates over 50 VHF Ground stations and provides blanket SATCOM coverage across the African region.

1.4   In addition to SATCOM data link SITA delivers a SATCOM Voice service that has the potential to deliver significant safety benefits in the AFI region given the lack of VHF R/T in some areas and performance issues associated with HF voice communications. SITA is willing to work with ICAO to maximise the delivery of efficiency and safety benefits for air navigation that can be accrued through the use of digital air/ground communications.

1.5   Recognising the values of collaboration in enhancing safety in AFI, SITA has been working with ICAO/ACIP to assist in the data collection and development of training database for harmonization of Aviation Training Institutes in AFI.

1.6   With the emergence of the Internet Protocol (IP) as the de-facto international standard and recently adopted by the ICAO Aeronautical Communications Panel, SITA encourages air navigation service providers to migrate to this cost-effective technology for the international and domestic data communications with the rapid obsolescence of legacy technology such as X.25 and low speed AFTN connections. Today, SITA provides the critical Eurocontrol Central Flow Management Unit (CFMU) application with over 100 IP connections across Europe to enable the exchange of flow management data between the participating air navigation service providers and the CFMU. SITA's selection by Eurocontrol to design, implement and manage an IP enabled Pan European Network Service (PENS) to support the exchange of multiple application data including flight plans, radar data, NOTAMS, flow management etc. on a regional basis is an example that other regions should emulate.   Such connectivity will enable the implementation of advanced concepts such as System Wide Information Management (SWIM) and Collaborative Decision Making (CDM) which involve the hosting and sharing of relevant stakeholder information (airlines, airports, ATC) in centralised databases so as to maximize information sharing and therefore enable the optimal use of available capacity.

2.   **BACKGROUND**

2.1   In AFI region, implementations of communications, navigation, and surveillance (CNS) systems and applications are continuing peace-meal but the pace is very slow compared with other ICAO regions.

2.2   The scattered and fragmented approach is likely to delay regional compliance, introduce harmonization and inter-operability issues and lead to uneconomical implementations.

2.3   APIRG 16 (Conclusion 16/31) had clearly stated the need for collective approach in the management of CNS/ATM system elements.

2.4   Conclusion 5/18 of ALLPIRG/5 states that "work towards integrated regional/interregional digital communication networks with a single (centralized) operational control and preferably based on the Internet Protocol (IP)" should be considered.

3.   **DISCUSSION**

3.1   Today SITA delivers reliable data communications services across the African continent to support airline requirements and has ensured IP service availability across the continent. Given that sustainable and reliable telecommunications is an essential pre-requisite to the delivery of safe and efficient air navigation services, SITA is willing to work with ICAO to identify areas where SITA's capabilities can resolve deficiencies identified in the existing communications infrastructure.

3.2   SITA also delivers PENS, a managed Internet Protocol based regional communications backbone service that will enable the 38 ANSPs of the EUROCONTROL Member States to exchange operational ATC voice and data communications in a seamless and integrated manner. This service will provide an alternative to the ad-hoc bi-lateral communications that are largely in place today between the ANSPs resulting in increased service levels and reduced overall costs. It will serve both today's needs for inter-ANSP information exchange and those envisioned by SESAR - the Single European Sky Air Traffic Management (ATM) Research Programme - under its System Wide Information Management initiative thus laying a key foundation for the Single European Sky with its goals of increasing capacity, improving safety, reducing aviation's environmental impact and cutting ATM costs by 50%. PENS will additionally replace the individual IP network services that have been providing services to EUROCONTROL's Central Flow Management Unit (CFMU) and European Aeronautical Information Service Database (EAD) centralized applications thus delivering further economies of scale given the number of common points where both CFMU and EAD services are delivered. SITA is willing to work with ICAO in expanding this concept and experience to AFI wide integrated ATM network that will enable the realization of a common AFI AMHS switch and Centralized AIS database in order to resolve identified communication deficiencies and interoperability issues.

3.3   Based on feedback that SITA has received from many air navigation service providers from around the world, including many in the AFI region, the ICAO recommendation to migrate from AFTN To AMHS has resulted in many questions given the inherent complexity to specify, procure, install and maintain AMHS equipment especially when the operational and cost/benefits are not clear. As an established service provider with significant experience in messaging services for the airline community (including the transmission and conversion of flight plans from SITA to ICAO formats) SITA is well positioned to deploy an AFI wide common AMHS service which would obviate the need and burden on air navigation service providers to make intensive individual capital investments for AMHS equipment

leaving them with the simple requirement to operate user terminals whilst still complying with ICAO recommendations. SITA is willing to work with ICAO to develop cost-effective solutions for enhancing the migration from AFTN to AMHS.

3.4 Today, the temporality, accuracy and integrity of Aeronautical Information do not meet future Navigation system requirements. Moreover, the current ATM system is based upon isolated information islands: civil and military AIS, MET, ATFM (Air Traffic Flow Management). This implies a series of transaction points at which aeronautical information integrity is potentially reduced: the same information is manually re-entered a number of times in discrete systems.

SITA recognises an effort to realise the AFI CAD initiative is underway under the close supervision of ICAO. Migrating from the current distributed AIS environment to a centralized AIS database is a necessary pre-cursor for migration to AIM that will ensure uniqueness of aeronautical information throughout the ATM/CNS system. AIM is a new function of ATM/CNS that broadens the current scope of Aeronautical Information. It ensures its quality, integrity and timeliness through the use of fully digitized interoperable systems and enables dynamic context based retrieval/delivery of Aeronautical Information. Being at the heart of the aviation Information and Communication Technology, SITA is well positioned to assist APIRG and ANSPs in realizing a central AIS database with a view to migrate to a common AIM environment. SITA is willing to work with ICAO in achieving the above in a reliable and cost effective manner.
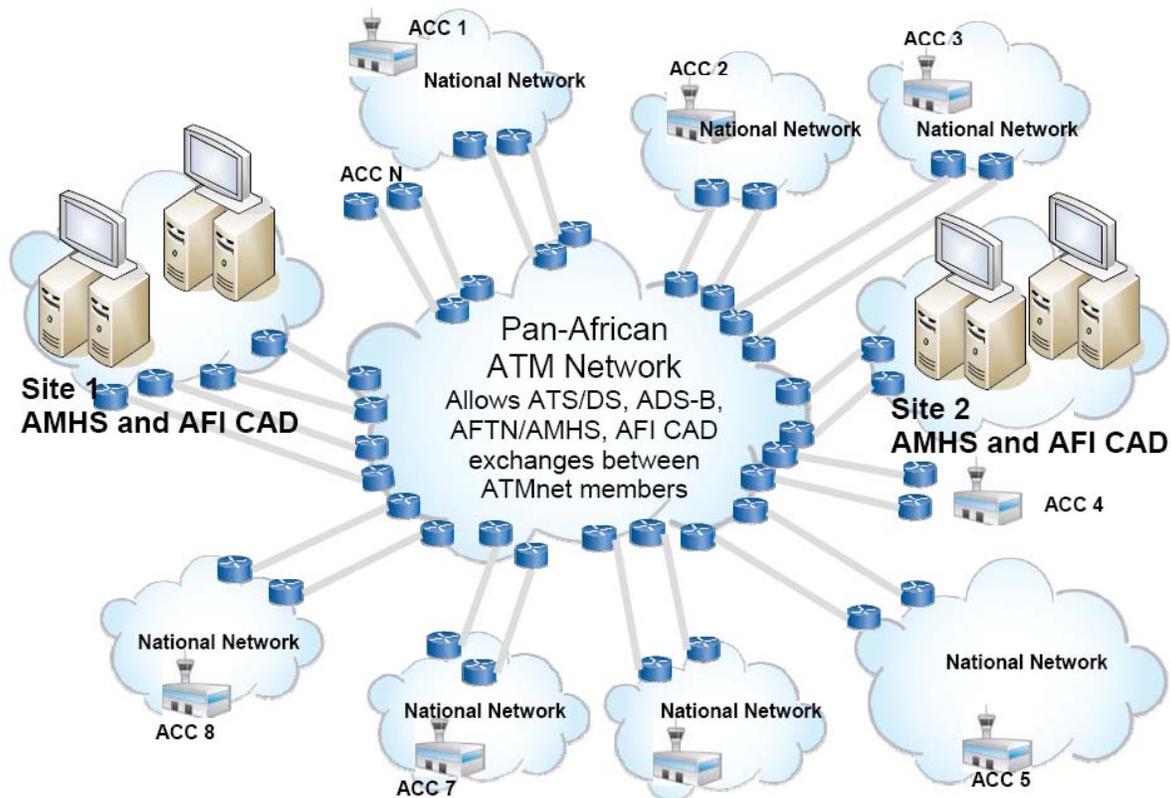

Fig. SITA's vision for a Pan-African ATM network supporting common AMHS switch and AFICAD

4.   **CONCLUSION**

4.1   In general it is important to note:

a)   harmonized implementation of complex CNS/ATM technology across regions such as Africa in a cost effective and accelerated manner can only be achieved through a collaborative effort;

b)   the value of States collaborating with international service providers that have the capability to facilitate harmonized implementation of complex CNS/ATM technology across regions such as Africa in a more cost effective and accelerated manner cannot be underestimated;

c)   identifying suitable solutions, overseeing their implementation and on-going management requires the creation of a technical bureau;

d)   the initial funding of the required CNS/ATM solutions may require support from development partners; and

e)   that SITA is willing to support in the realization of the efforts done so far by APIRG and its various sub-groups in achieving the targets set in the ICAO Global Air Navigation Plan.

5.   **ACTION BY THE MEETING**

5.1   The meeting is invited to:

a.   comment on the proposed regional implementation strategy; and

b.   request APIRG to consider and develop this initiative further, in consultation with the industry.

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