International Civil Aviation Organization

AN-Conf/13-WP/85
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**WORKING PAPER**

# THIRTEENTH AIR NAVIGATION CONFERENCE

**Montréal, Canada, 9 to 19 October 2018**

**COMMITTEE A**

**Agenda Item 3: Enhancing the global air navigation system**
**3.1: System-wide information management (SWIM)**

## REGIONAL SYSTEM-WIDE INFORMATION MANAGEMENT (SWIM) DEMONSTRATIONS

(Presented by Brazil)

**EXECUTIVE SUMMARY**

This paper presents a proposal for the realization of regional SWIM demonstrations in support to the updating of regional and national implementation plans and in complement to the ongoing SWIM developments as described in AN-Conf/13-WP/4.

**Action:** The Conference is invited to agree to the recommendation in paragraph 3.3.

## 1. INTRODUCTION

1.1 As highlighted in the *Global Air Traffic Management Operational Concept* (GATMOC, Doc 9854), the air traffic management (ATM) community will depend on information management, shared on a system-wide basis, to make informed collaborative decisions for the best business and operational outcomes.

1.2 The *Global Air Navigation Plan* (GANP, Doc 9750) states that system-wide information management (SWIM) is an essential enabler for ATM applications, providing an appropriate infrastructure and ensuring the availability of the information needed by the applications run by the members of the ATM community. Guided by GANP, the regional and national planning processes should be aligned and used to identify those aviation system block updates (ASBU) modules which best provide solutions to the operational needs identified.

1.3 With the support of States, through the Information Management Panel (IMP), ICAO is working on the necessary provision related to SWIM, including the definition of the Standards and Recommended Practices (SARPs), along with guidance material, as described in AN-Conf/13-WP/4.

## 2. DISCUSSION

2.1 In theoretical terms, the SWIM concept has been adequately developed, through the work done by IMP. In practical terms, the IMP has also been working to provide guidance material to support the SWIM implementation by the States.

2.2 The implementation of a concept as complex and disruptive as SWIM, in both technological and managerial terms, requires high investment of resources and therefore must be properly evaluated and planned to ensure the achievement of expected objectives and benefits.

2.3 The development of regional plans for air navigation systems, on the basis of GANP, is undertaken by ICAO six planning and implementation regional groups (PIRGs), which are as follows: APANPIRG (ASIA/PAC Air Navigation Planning and Implementation Regional Group), APIRG (Africa-Indian Ocean Planning and Implementation Regional Group), EANPG (European Air Navigation Planning Group), GREPECAS (CAR/SAM Planning and Implementation Regional Group), MIDANPIRG (Middle East Air Navigation Planning and Implementation Regional Group) and NATSPG (North Atlantic Systems Planning Group).

2.4 It is emphasised in the GANP that the "deployments on a global, regional and sub-regional basis and ultimately at State level should be considered as an integral part of the global and regional planning process through PIRGs". The activities carried out within PIRGs are essential to support the development of national plans by the States, as shown in Figure 1.

2.5 Using GREPECAS as an example, it is possible to observe that its current programs are consistent with ASBU Block 0, in spite of the fact a more forward-looking approach could be adopted to support the results to be achieved through them and to provide States with the necessary strategic information to be considered when planning their resources with the proper priorities for the coming years.

2.6 In this sense, SWIM regional demonstrations could be part of PIRGs projects, so they would have proper support from ICAO and the States, which is useful to fulfil PIRGs' purpose to update regional implementation plans in support to national plans.

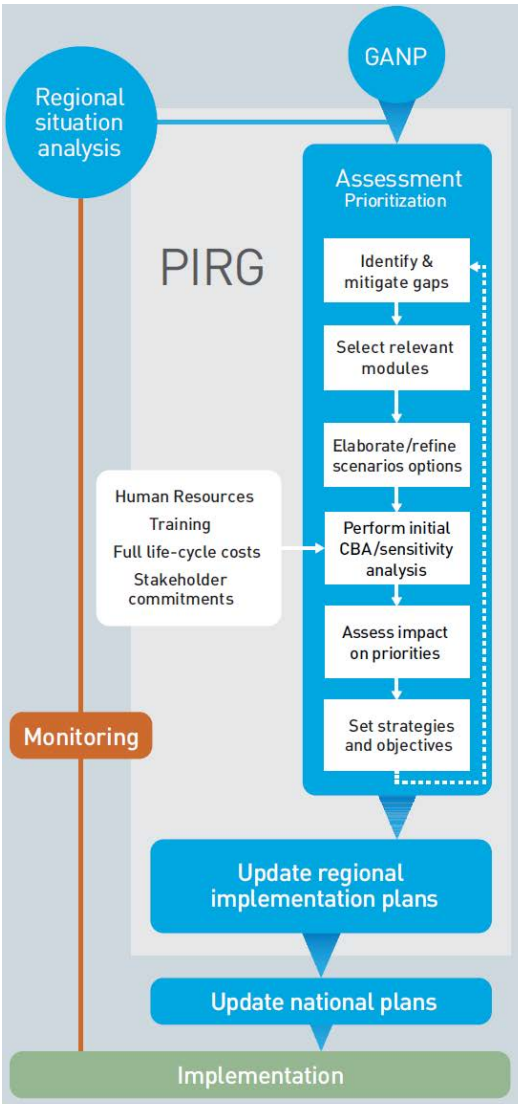


Figure 1: Regional Planning (Source: GANP, Doc 9750)

2.7 It is well known that SWIM global demonstrations held by the Federal Aviation Administration (FAA) and Single European Sky ATM Research (SESAR) programme were important to consolidate the SWIM concept and to provide inputs to SWIM-related documentation. Similar exercises, adopting regional use case scenarios, could be helpful for the States to better understand the concept and to identify on a more concrete basis the benefits of investing resources in SWIM, so they are able to

establish the implementation strategy that best fits the characteristics of local ATM system as well as national and regional interests.

2.8 In this sense, Brazil carried out a first SWIM demonstration, during the II Workshop on Cyber Security for the CNS/ATM and SWIM, held in November 2017. The main objective was to simulate in a practical way the service-oriented architecture (SOA) on which SWIM is based, showing the benefits that can come from its adoption. The Department of Airspace Control (DECEA) professionals were present, as well as representatives from industry, academia, service providers and users of the Brazilian ATM system. In addition to its technical objectives, the demonstration provided an environment conducive to collaboration between DECEA and the national ATM community for issues related to SWIM. Given the SWIM characteristics by definition, close cooperation among the various stakeholders is considered an essential factor for the consistent implementation of SWIM.

2.9 If the realization of global and local demonstrations has shown its role to support the implementation of SWIM, it is natural to conclude that the same exercise, carried out regionally, has the potential to add value to the development of SWIM within this scope. It is also an opportunity for the States within the same region to identify areas where they can cooperate with each other, whether exchanging expertise, sharing assets, or otherwise.

2.10 Regional SWIM demonstrations may comprise specific regional needs. According to the Brazilian experience, the following are examples of scenarios that can be tested and validated in regional SWIM demonstrations:

2.10.1 SWIM Registry

— Information interoperability through SWIM independent national registries; and

— Adoption of a regional common SWIM registry.

2.10.2 Cyber Security

— Core services and infrastructure framework needed to demonstrate SWIM cyber-resilience; and

— Cyber threats and vulnerabilities mapping and treatment.

2.10.3 Domain specific services

— Services lifecycle; and

— Provision and consumption of aeronautical information service (AIS) and meteorological (MET) services through SWIM infrastructure.

2.10.4 Interdomain services

— Composing services to address specific consumers’ needs through SWIM.

2.10.5 Governance

— Regional agreements on SWIM-related regulatory policies; and

— Civil-military cooperation.

2.10.6 Transition to SWIM

— Solutions for transitioning to SWIM (mixed environment).

## 3. CONCLUSION

3.1 It is important that the ongoing work on the development of provisions related to SWIM, as stated in AN-Conf/13-WP/4, continue to be done and supported by States.

3.2 Similarly, it is also important to ensure the harmonization of the understanding of SWIM concept and principles among members of the aviation community. In this case, in addition to the promotion of events on SWIM, as recommended in AN-Conf/13-WP/4, the realization of regional SWIM demonstrations, proposed in this working paper, is seen as a more concrete means to support regional and national SWIM implementation plans.

3.3 Considering the information above, the Conference is invited to agree to the following recommendation:

That the Conference request the ICAO Regional Offices to support the realization of regional system-wide information management (SWIM) demonstrations, through respective projects of the Planning and Implementation Regional Groups (PIRGs).

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