International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
SIXTEENTH MEETING OF THE CAR/SAM REGIONAL PLANNING AND IMPLEMENTATION GROUP (GREPECAS/16)
Punta Cana, Dominican Republic, 28 March – 1 April 2011

Agenda Item 3: Performance framework for Regional Air Navigation Planning and Implementation

3.1 Global, inter-regional and intra-regional activities concerning air navigation systems in the CAR/SAM Regions

INTEGRATED SYSTEM FOR AIR MOVEMENT MANAGEMENT (SIGMA)

(Note presented by Brazil)

SUMMARY

This information paper presents the new features planned for the evolution of SYNCROMAX, which will be called SIGMA (Integrated Air Movement Management System), and the estimated schedule for its implementation within the Air Navigation Management Center (CGNA).

1. Introduction

1.1 In 1998 there were four centers in the world for Air Traffic Flow Management (ATFM), located in the USA, Europe, Asia and South Africa. At that time, with the continued growth of flights in South America, the need for an ATFM center for the region became apparent, especially for the Brazilian airspace.

1.2 The Directorate of Electronics and Flight Protection (DEPV), current Department of Airspace Control (DECEA), in accordance with the technical and operational information provided by EUROCONTROL (CFMU) and the FAA (ATCSCC), then started the application of traffic flow management techniques in the Brazilian airspace.

1.3 This initiative allowed for meeting the flow management needs which were already outlined, and were later confirmed by the significant increase in Brazilian air traffic demands, which are still present today.

1.4 The supply scope of the initial phase of the ATFM Program considered the need to store information about the actual air traffic demands versus airport capacity, air navigation aids and air traffic control in Brazil, before designing a permanent solution to the problem.

1.5 To this end, during 32 months, the following activities were carried out: Concept of Operations, detailing of the System Requirements Specification, System Design, External Interface Specification, Software Specification, Software Design, Development of ATFM Prototype, Operational Validation (proof of concept), Setup Control and Quality Management and Training.

1.6 From that ATFM prototype, which became known as SYNCROMAX, DECEA acquired sufficient knowledge to specify and contract with Atech, a Brazilian company, the incremental development of an air traffic flow management system for operational use at the Brazilian Air Navigation Management Center (CGNA), operating in São José dos Campos.

1.7 The CGNA, which moved to Rio de Janeiro in 2006, where it could provide better quality service for the users of the Brazilian airspace, now operationally uses SYNCROMAX, the incremental development of which continues in line with the implementation of new CNS/ATM concept in the Contracting States of the International Civil Aviation Organization (JCAO).

1.8 It is noteworthy that SYNCROMAX is a system that fully meets the current flow management system requirements; however, an evolution process is needed for the new features and increased performance, in function of the new technologies developed and the continuing need to increase airspace capacity.

2. Evolution to SIGMA

2.1 Currently in SYNCROMAX, much information is entered manually by Users, generating a very intense workload. Therefore, the Integrated System for Air Movement Management (SIGMA) was designed to represent an evolution from SYNCROMAX, being fully integrated to the systems that provide flow management data.

2.2 SIGMA provides the centralization of flight plan processing and the implementation of new subsystems to CDM (Collaborative Decision), SLOT Center, Capacity Calculation, Ground Delays (GDP) and Air Situation Management (GSA), among others.

2.3 Among the new features to be incorporated with the entry into operation of SIGMA, the following can be highlighted:

- Initial flight plan processing will be centralized;
- Slot Allocation;
- Automation of the acquisition of meteorological data;
- Monitoring of air operations;
- Simulation capabilities for testing alternative scenarios;
- Management of conditioned airspaces (EAC);
- Automatic processing of AIS data; and
- Automatic handling of proposed permits for carrying out regular commercial aviation operations (HOTRAN).

2.4 To maintain CGNA’s operability, a backup Center will be created, to be located in São José dos Campos - SP, which will assume the functions of the main Center in case of hindrances that affect its continuous operation, as shown below, which also illustrates SIGMA external subsystems and interfaces.

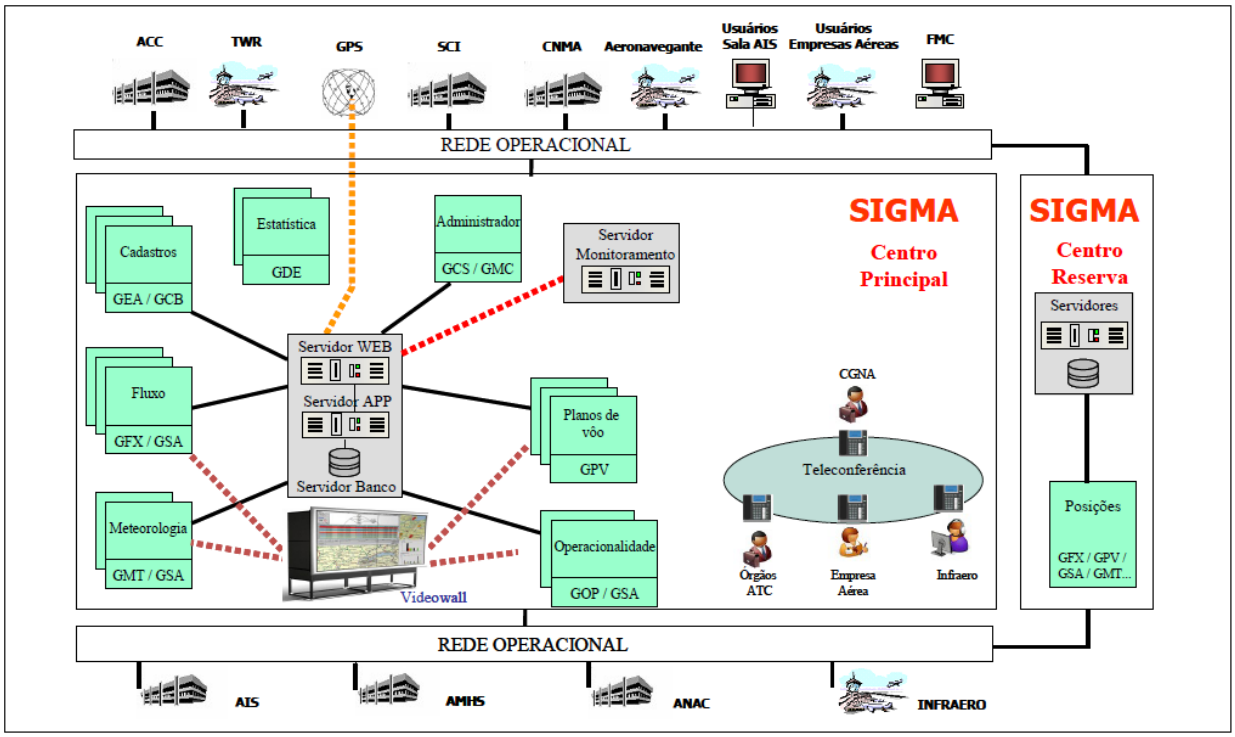

Figure 1 - SIGMA External Subsystems and Interfaces

3. SIGMA Implementation Schedule

3.1 The functionalities related to air traffic flow management activities will be implemented by April 2011.

3.2 Features related to the centralization of flight plan data and complementation of the Main Center will be implemented by February 2012

3.3 The functionalities directed to system contingency (Backup Center), which are related to the flight plan centralization and air traffic flow management will be implemented by July 2012.

4. Conclusion

4.1 The Air Traffic Flow Management System (SYNCROMAX), which was developed from the embryonic ATFM Prototype, meets the current requirements of CGNA's flow management system.

4.2 Due to increased air traffic demand and the new CNS/ATM concepts, DECEA is in an advanced process for deploying a new system entirely developed in Brazil to be called SIGMA (Integrated System for Air Movement Management).

4.3 The expected implementation of SIGMA, with all the new features, is planned for July 2012, and completion of this project will make this System a very important tool for the exercising the air traffic flow management activity in Brazil.

– END –