International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
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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

ADVANCED SYSTEM OF INFORMATION MANAGEMENT FOR AIR TRAFFIC AND REPORTS OF OPERATIONAL INTEREST (SAGITARIO)

(Note presented by Brazil)

SUMMARY

This information paper presents the Automated ATC System SAGITARIO (Advanced System of Information Management for Air Traffic and Reports of Operational Interest), which will be implemented in the Brazilian ATC units in replacement of the X-4000 System.

1. Introduction

1.1 In 1988, Brazil began developing an automated ATC system with national technology, based on the experience accumulated since the '70s, using the MITRA System (Thomson), culminating with the entry into operation of the X-4000 System in the Rio de Janeiro Approach Control (APP), in 1993.

1.2 The system has evolved, incorporating new operational demands, based on requirements set by the Air Traffic Controllers, as well as technology transferred from the United States, through the design of the Amazon Surveillance System (SIVAM) since 1998, enabling the deployment in Manaus, as of 2002, of a new automated ATC system, which has contributed to the evolution of all the other X-4000 Data Processing and Visualization Systems (STVD) of the Area Control Centers (ACC) and APP currently in operation in Brazil.

1.3 In 2008, incorporating concepts from EUROCONTROL, a new generation of STVD with national technology started to be developed by the domestic industry: SAGITARIO (Advanced System of Information Management for Air Traffic and Reports of Operational Interest)

2. Evolution to SAGITARIO

2.1. With the imminent advent of new technologies applicable to civil aviation, Brazil has been incorporating into its automated ATC systems the capacity to process new available surveillance means, amongst them the Automatic Dependent Surveillance – Contract (ADS-C) and the Automatic Dependent Surveillance – Broadcast (ADS-B). SAGITARIO is ready to process data from these new surveillance systems.

2.2 The level of integration between automated centers has increased, creating the need to incorporate into SAGITARIO the data exchange protocol from ATS surveillance (ASTERIX categories 62 and 63) as well as the coordination protocols between the ATC units: On-Line Data Interchange (OLDI) and ATS Interfacility Data Communications (AIDC).

2.3 The Control Tower management systems were integrated into the ACC and APP SAGITARIO versions, increasing the flow of operational information and the coordination between these control agencies.

2.4 SAGITARIO is completely integrated to SIGMA (Integrated System for Air Movement Management), scheduled to operate at the CGNA – Air Navigation Management Center, allowing an adequate compatibilization between demand and capacity.

2.5 Inspired by concepts embodied in the systems operating in Europe, coupled with the knowledge of the Brazilian operational needs, the SAGITARIO HMI (Human Machine Interface) makes more than 90% of the features employed in the air traffic activity available at the click of the mouse.

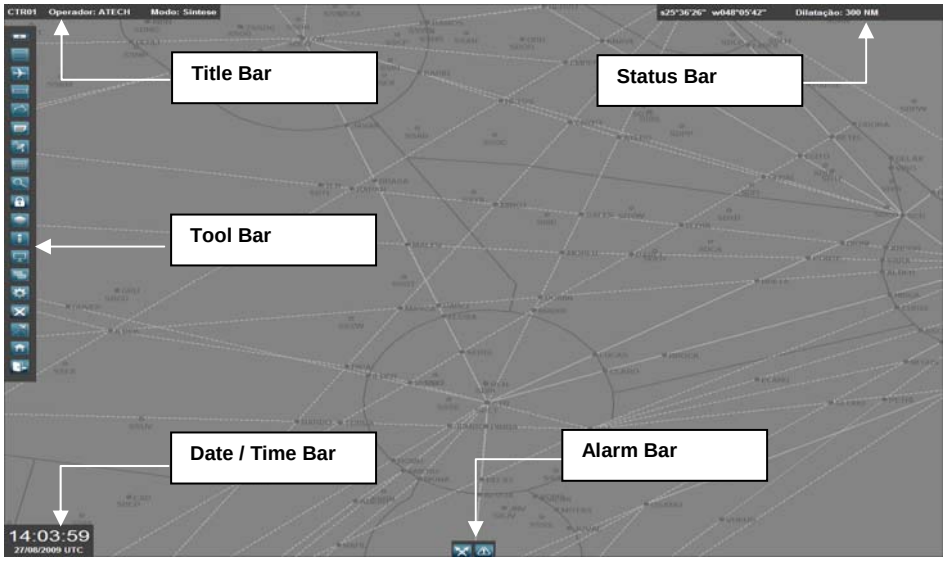

Fig. 1 – SAGITARIO Human Machine Interface (HMI)

2.6 Throughout the development of SAGITARIO, German technology was transferred, through DFS - Deutsche Flugsicherung GmbH, which provided its Multi-Sensor Tracker (MST) and the Arrival Manager (AMAN) to the Brazilian Government.

2.7 The MST allows integration of information from multiple ATS surveillance sensors in a synthesis with greater accuracy, reliability and smoothness for air traffic controllers.

2.8 The Arrival Manager (AMAN) is a management tool for arrival movements used in supporting approaches to the Frankfurt airport, in Germany, which is one of the five busiest airports in Europe, and fully incorporated into SAGITARIO.

2.9 Always seeking to increase safety in the use of the Brazilian airspace, SAGITARIO also incorporates new safety tools that allow the controller to have advanced warnings of medium term conflict detection (MTCD), which are graphically presented, and it enables conflict resolution to be done by means of visual route editing tools, ensuring simplicity of use and efficacy in the air traffic control activities.

2.10 The architecture of SAGITARIO significantly increased system availability, integrating concepts of parallel processing chains for Backup, Training and Assessment (BTA), helping to maintain the operability of the system, even in the event of scheduled maintenance and system upgrades.

2.11 With the introduction of SAGITARIO, the concept of an IP network for ATS surveillance sensors becomes possible, enabling a reduction in the costs of maintaining telecommunications networks, by eliminating the need for dedicated lines for each sensor, and creating the necessary conditions for the ATS surveillance data to be received by the largest number of control sectors, thus ensuring greater flexibility in the configuration of airspace. In addition, SAGITARIO incorporates AMHS (Aeronautical Message Handling System) communications technology, allowing increasing integration with neighboring countries.

2.13 Weather information also received attention in the development of SAGITARIO, allowing AIREP (aircraft report) messages provided by the aircraft to be handled.

3. Implementation Schedule

3.1 The first version of SAGITARIO went into operation in October 2010 in the Curitiba ACC, and the upgrade of other continental ACC (Amazon, Brasília and Recife) is expected to start operations by July 2012.

3.2 The entry into operation of SAGITARIO is also envisaged in two of the most important APP in Brazil - APP-BR (Brasília-DF) and APP-SP (São Paulo) - until October 2012.

4. Conclusion

4.1 SAGITARIO is the result of a long search for technological independence, featuring an integrated ATC automation tool that covers virtually all phases of flight coordination.

4.2 SAGITARIO opens the scope of choices for the full range of surveillance sensors, giving Brazil the ability to select the technology that more adequately meets the operational needs of airspace users of the airspace under its jurisdiction, as well as optimizes resources used in the operation and maintenance of automated systems, by employing the IP network concept.

4.3 SAGITARIO incorporates new concepts and tools that will optimize the provision of ATS services, of which the following stand out: new HMI, ease of integration with adjacent ATC units (national and international), increased system operational availability and use of arrival management system (AMAM).

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