



**Agenda**

**Item 2: Report of activities of the GESEA and Subgroups**

**THE IMPLEMENTATION OF THE CONCEPT OF  
VERTICAL SECTORIZATION IN BRAZIL**

(Presented by Brazil)

**Summary**

The purpose of this working paper is to present a summary of the implementation of the concept of vertical sectorization in Brazilian airspace, the status of this process and the next steps envisaged.

**References**

- Summary of GESEA/3 Plenary

**1 Background**

1.1 With the development of aviation as the main means of transport in the country, it became necessary to create the conditions to receive more aircraft in the airspace, maintaining high levels of safety in these operations. Therefore, to increase the ATC capacity of the airspace and absorb these new demands, the Department of Airspace Control (DECEA), through the Airspace Planning Study Group (GEPEA), coordinated the implementation of the concept of Vertical Sectorization in the Flight Information Region (FIR) of Brasilia (SBBS)

1.2 The project is an undertaking of the Subdepartment of Operations (SDOP), through GEPEA, a permanent forum, created with the aim of discussing opportunities for improvement in the organization and management of Brazilian airspace, through studies conducted by specific working groups.

**2 Analysis**

2.1 The planning and execution of tasks for the implementation of the concept of vertical sectorization in the FIR Brasilia (SBBS) involved several stages, from technologies, human resources and operational testing.

2.2 Designed to be applied by all Brazilian FIRs, vertical sectorization aims to generate greater fluidity and reduce the complexity of airspace sectors, without negatively affecting operational safety. In this way, more flights will pass through the same portion of the airspace, monitored by different controllers, depending on their altitude, thus allowing a considerable increase in the capacity of their airspace.

2.3 How was this new concept planned at the FIR Brasilia? Overlapping ATC sectors were created, with different vertical boundaries: the lower sectors (LOWER SECTORS) and the upper sectors (UPPER SECTORS). In the case of the airspace of the FIR Brasilia, the lower sector goes from the ground at an altitude of 35,000 feet, while the upper sector comprises an altitude of 36,000 feet or more. The concept of vertical sectorization was applied to these sectors at times of greatest aircraft movement, that is, at times when demand is high and flow needs to be managed.

2.4 Thus, when a significant increase in the number of flights is perceived – either by the ATC supervisor or by the local or national flow manager (of the Air Navigation Management Center – CGNA) – the representatives of the ATC units can suggest the division of vertical sectors, thus increasing the capacity to absorb demand.

2.5 Permanently, aircraft are monitored by air traffic controllers, who carry out the transfer and coordination between the ATC sectors, offering a service within the international standards of quality and efficiency, in accordance with the standards of the International Civil Aviation Organization (ICAO).

2.6 With the implementation of vertical sectorization, air traffic control gains flexibility and airspace users can maintain shorter trajectories, in addition to avoiding, in the best possible way, any adverse situation, such as infrastructure degradation or severe weather.

### 3 Real-time training and simulation

3.1 To enable the implementation of vertical sectorization in the Brasilia FIR (SBBS), air traffic controllers from the Rio Region (R-RJ) of the Brasilia Area Control Center (ACC-BS), located in the First Integrated Air Defense and Air Traffic Control Center (CINDACTA I), participated in the training through real-time simulation.

3.2 The sectorization project was developed with the aim of increasing the capacity of the sectors in the Rio Region, in line with the demand for the new circulation of the São Paulo Terminal (SBXP). Instead of creating new lateral sectors, it was thought to create vertical sectors with division of levels, based on the legal provisions of ICAO and examples of what happens in other countries such as the Netherlands, Portugal and the United States of America.

3.3 The training included all ACC-BS Rio Region staff, totaling 58 air traffic controllers, who underwent a load of at least 20 hours of simulation exercises. ACC-BS and CGNA professionals were responsible for identifying operational needs and priorities and planning the simulated exercises and monitoring the execution of theoretical and practical instruction.

3.4 The training included simulated scenarios that have as general objectives: the use of surveillance services, conflict detection and resolution, traffic flow analysis, sequencing, information and flight alert services, appropriate use of Portuguese and English phraseology, saturation of the sectors and setting of the new UPPER and LOWER sectors.

3.5 With the implementation of vertical sectorization, there will be a significant increase in the capacity of the ATC sectors, which will provide greater safety and fluidity in air traffic. These metrics were tested and analyzed by Total Airspace and Airport Modeler (TAAM), CGNA's accelerated time simulation tool. The project effectively articulated the technical and operational areas, making the concept possible.

3.6 Therefore, the implementation of the Vertical Sectorization concept in Brazil has already provided a significant increase in the capacity of ATC sectors with large air traffic movement, thus reducing the number of ATFM measures for the Rio Region Sectors of the ACC Brasilia. A significant reduction in

the operational complexity of the Centre's daily life is also expected, increasingly contributing to the reduction of fuel consumption and CO2 emissions into the atmosphere. The next implementations are planned for the FIR Recife (SBRE), FIR Amazônica (SBAZ) y FIR Curitiba (SBCW).

3. **Suggested Actions**

3.1 States participating in the Meeting are invited to:

- a) Take note of the information provided in this paper; and
- b) disseminate its vertical sectorization initiatives for the knowledge of the countries of the SAM Region.

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