



ASSEMBLY — 39TH SESSION

TECHNICAL COMMISSION

Agenda Item 37: Other issues to be considered by the Technical Commission

NATIONAL AEROSPACE SURVEILLANCE AND CONTROL SYSTEM

(Presented by Argentina)

EXECUTIVE SUMMARY

In 2004 the “National Aerospace Surveillance and Control System” (SINVICA) is created in Argentina. Its main objective is to supply a radar system that allows to comply with the tasks related to the aerospace defense and provide efficient air traffic service, in order to:

- a) contribute to preserve the vital interests of the Nation;
- b) control irregular or illicit traffic;
- c) comply with existing international commitments in the field;
- d) increase aerospace safety nationwide;
- e) optimize the use of air routes and terminal areas, thus reducing flight delays;
- f) provide real-time meteorological and aeronautical information;
- g) achieve greater operational skills, with the consequent cost reduction for users; and
- h) provide assistance to aircraft which are lost or in emergency situations.

The development and manufacture of radars in Argentina has been conducted by the company INVAP S.E. To date, the company has manufactured and installed TWENTY TWO (22) Secondary Monopulse Radars (RSMA) and SIX (6) Primary Radars (RPA). It has also manufactured SIX (6) Weather Radars (RMA), of which THREE (3) have already been installed.

The aim of this Information Paper is to provide the international aviation community with information on the development, manufacture and installation of radars in Argentina, for civil and commercial air traffic control.

<i>Strategic Objectives:</i>	This paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	Not applicable.
<i>References:</i>	Annex 10, Volume IV – <i>Aeronautical Telecommunications</i> Annex 14, Volume I – <i>Aerodromes</i>

¹ English and Spanish versions provided by Argentina.

1. INTRODUCTION

1.1 The National Aerospace Surveillance and Control System (SINVICA), which was created in 2004 by Presidential Decree 1407/04, was a national strategy of radar coverage that promoted the development, manufacture and installation of TWENTY TWO (22) Secondary Monopulse Radars (RSMA) to control civil and commercial air traffic. The radar coverage today reaches 95% of the air routes.

1.2 In the year 2005 secondary radars coverage in Argentina only relied on FIVE (5) radars located in the following airports: Ezeiza, Mar del Plata, Mendoza, Córdoba and Paraná. Such radar coverage is shown in the following picture:...

Situación 2005



1.3 By means of this Decree, which promoted technology sovereignty in the long term, our country also began producing its own primary radars in a joint work with the Air Force, the company “Fabricaciones Militares” and the company INVAP S.E. The beginning of the radar coverage plan also contemplated the development and manufacture of an Argentine prototype of a secondary monopulse radar that complied with ICAO SARPs. At present these radars are operated by the Civil Aviation Authority (ANAC).

2. ARGENTINE SECONDARY MONOPULSE RADAR (RSMA)

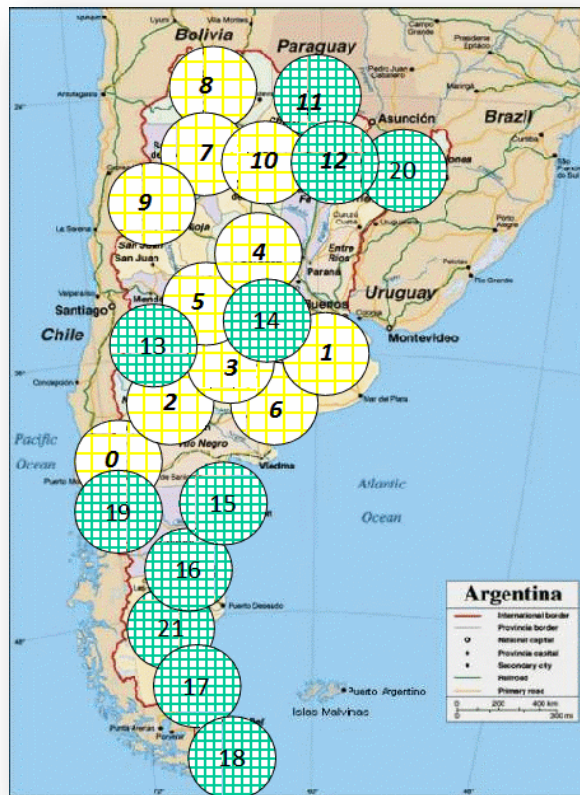
2.1 The Secondary Monopulse Radar (RSMA) prototype was approved in November 2007, at San Carlos de Bariloche International Airport (SAZS), task that was carried out with the collaboration of ICAO inspectors.

2.2 The first series of RSMA, consisting of 11 sets, was installed between 2008 and 2011.

2.3 The second 11-set-series of RSMA was installed between 2011 and 2013.

2.4 The RSMA complies with ICAO SARPs stated in Annex 10, as well as with all documentation published by the Organization regarding secondary radars for air traffic control. This radar thereby operates in the five interrogation/answer modes: 1, 2, 3/A, C, and S “all call” mode interlaced with up to three of such modes.

2.5 The picture below shows secondary radars location (first and second series):



3. ARGENTINE PRIMARY RADAR (RPA)

3.1 The main function of this technology is to capture data of the situation and movement of the air activity within its coverage. This type of radar allows the following tasks: detection, surveillance,

identification and control within the airspace. RPA design articulates the latest developments in the sector to reach high reliability and long-term logistic support competence.

3.2 The RPA is built with electronic scanning technologies in its active antenna (phased array flat antenna), fully solid state circuits and digital signal processing. The antenna, with electrical pointing transmission and reception, provides a coverage that adapts to the ground, thus optimizing the exploration process. The contract for the development of 3D Primary radars was signed in the year 2007, and it was approved in November 2013.

3.3 FOUR (4) Primary radars were installed as part of the “North Shield”, enabling the control of air traffic all along the northern border of Argentina.

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3.6 The following picture shows the location of the Primary radars (RPA) that have already been installed in the national territory and those that are to be installed:



4. ARGENTINA WEATHER RADAR (RMA)

4.1 The contract for the development and manufacture of a Weather Radar (C-band Polarimetric Doppler Radar) was signed in 2011.

4.2 The Weather Radar prototype installed at San Carlos de Bariloche International Airport (SAZS) began operating in 2014.

4.3 In the year 2015 the first radar of the 11-set-series was installed in the City of Córdoba.

4.4 To date, a total of SIX (6) Weather Radars (RMA) have been manufactured, THREE (3) of which have already been installed in the following airports: RMA0 Prototype in Bariloche, the first of the RMA1 Series in Córdoba and the second one of the RMA2 Series in Ezeiza.





5. CONCLUSION

5.1 The joint work between the State, the various agencies that work to ensure air traffic safety in the national territory, and INVAP S.E., has allowed the development of a national technology in order to achieve the objectives.

5.2 To date, as mentioned herein, the company INVAP S.E.:

- a) has manufactured and installed 22 Secondary Monopulse Radars (RSMA);
- b) has manufactured and installed 6 Primary Radars (RPA); and
- c) has manufactured 6 Weather Radars (RMA), of which 3 have already been installed.

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