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

IMPLEMENTATION OF THE SOUTH-ATLANTIC INTEROPERABILITY INITIATIVE TO REDUCE EMISSION (SAIRE)

(Presented by Brazil)

SUMMARY

This paper presents Brazil and the SESAR Joint Undertaking interest to establish a South-Atlantic Interoperability Initiative to Reduce Emissions (SAIRE) to accelerate the implementation of environmentally friendly procedures on the Europe - South America (EUR/SAM) oceanic routing areas by performing integrated flight trials validating solutions for the reduction of CO_2 emissions. If materialized, this initiative will be established through a partnership programme similar to existing AIRE (NAT region) and ASPIRE (Asia/Pacific region). This paper also provides some background information on these routes and identifies some potential improvement areas that can be carried out under the SAIRE scope. The meeting is invited to take note of the information presented in this paper with a view to have a decision at the next SAT/FIT meeting.

1. INTRODUCTION

1.1 The SESAR Joint Undertaking (Single European Sky ATM Research Joint Undertaking) is an European Community body in charge of all the development activities in Europe to deliver the new generation of Air Traffic Management systems and procedures under the Single European Sky framework. SESAR has set very ambitious goals in the short and medium term - including the reduction of the environmental impact per flight by 10% and the SJU is working decisively with its partners and the ATM community to attain this goal.

1.2 The joint EU/US initiative AIRE (Atlantic Interoperability Initiative to Reduce Emissions) started in 2007 as a programme designed to reduce emissions through the implementation of joint projects and exchange of best practices. Since 2008, the SESAR Joint Undertaking is responsible for its

management from a European perspective. The participants include ANSPs, airports, airlines and manufacturers from Europe, Canada, the United States, and Africa. Combined EU/US efforts have resulted in thousands of flight trials to date in real life operations.

1.3 During CAEP/8, February 2010, Spain, on behalf the European CAEP members and the EU already presented the European interest in expanding the experience and benefits from ongoing initiatives such as AIRE to other regions such as the Europe - South America oceanic areas. The initiative was supported and CAEP acknowledged the need for collaboration and establishment of synergies between different countries and authorities to improve aviation efficiency and reduce fuel burn hence CO_2 emissions.

1.4 In May 2010, initial discussions took place between the EC and Brazil to improve the mutual technical and operational cooperation on ATM matters. In August 2010, a Letter of Understanding was signed by Brazilian ATM Authority and the SESAR Joint Undertaking, agreeing in particular on the relevance of implementing an AIRE-like partnership focusing on optimizing traffic flows between the Europe - South America (EUR/SAM).

2. Background: AIRE PARTNERSHIP

2.1 AIRE aims to improve energy efficiency and lower aircraft noise through the development and implementation of environmentally friendly procedures for all phases of flight.

2.2 In 2009 under the framework of the European part of AIRE, approximately 1,150 demonstration trials for ‘green’ surface, terminal and oceanic procedures took place in five locations, involving 18 partners. Additionally, two full ‘green’ gate-to-gate flights, from Paris Charles de Gaulle (CDG) to Miami, took place in April 2010, which resulted in substantial gains.

2.3 CO_2 savings per flight ranged from 90 to 1250kg and the accumulated savings during trials equivalent to 400 tons of CO2. Another positive aspect was the human dimension - the projects boosted crew and controller motivation and enabled cooperative decision making.

2.4 In January 2010, a new call for tender was launched by the SESAR Joint Undertaking to co-finance the expansion of AIRE in 2010 and 2011. AIRE presently comprises on the European side alone 18 projects involving 40 airlines, 5 airport operators, 11 air navigation service providers and around 10 industry partners including the United States, Canada and Morocco. The projects are focused on operational implementation. Technical solutions presently being validated include inter-alia:

a) Lateral, vertical and longitudinal Oceanic optimizations;

b) Shorter flight trajectories through “free route” airspace;

c) Implementation of ADS-B surveillance on North Atlantic operations;

d) Implementation of Reduced Longitudinal Separation minimum in the NAT region based upon an increased position reporting rate and positional accuracy

e) CDOs (CDAs) in Amsterdam, Brussels, Cologne, Madrid, New York, Paris, Gothenburg, Prague, Pointe- a-Pitre, Toulouse, and Zurich;

f) Development of RNP AR and RNAV procedures in Sweden;

g) Enhanced surface management systems (pre departure sequencing system / Departure Manager);

h) Issue of Target-Off Block time (TOBT), calculation of variable taxi out time and issue of Target-Start-up Arrival Time (TSAT);

2.5 More than 5000 flights are expected to take place, with expected savings on the range of 12.000 tons of CO_2. A great effort will be placed in disseminating the results and experience by dedicated brochures and the organisation of workshops.

3. Current situation: South-Atlantic routes

3.1 Commercial aviation in the South Atlantic (EUR/SAM) airspace is characterized primarily by modern jet passenger and freight aircraft flying distances on average longer than 4000 nautical miles and with durations of eight hours or more.

3.2 The FIRs involved in the EUR/SAM routes are: Canarias, Casablanca, SAL Oceanic, Dakar Oceanic, Santa Maria, Recife, Piarco and Rochambeau. The use of CPDLC (*Controller Pilot Data Link Communications*) and ADS-C (*Automatic Dependant Surveillance*) is not yet available within the whole EUR/SAM corridor.

3.3 Air traffic flow is constricted in the upper airspace to four airways (West to East: UN-741, UN-866, UN-873 and UN- 857) except in an additional RANDOM route 50 NM West of UN-741 currently used on flights between e.g. Madrid and Santiago de Chile.

3.4 Data from AENA (Spanish ATM and Airports organization) show that traffic in the EUR/SAM Corridor increased by 31,8% in the period 2004-2008. AENA also estimated a high increase (over 60%) of traffic in those routes in the mid-term (2010-2015).

4. Possible improvements in South-Atlantic Airspace AND RELATED BENEFITS

4.1 Potential benefits of improving Europe - South America (EUR/SAM) traffic could be identified in all areas (surface, terminal area and en-route/oceanic) and could deliver results in the short term. By means of example, validation projects could be proposed in relation to the following improvement areas/solutions:

a) Oceanic trajectory optimization (horizontal, vertical, longitudinal);
b) Reduced separations for RNP 4 equipped aircrafts (lateral, longitudinal);
c) Optimized Oceanic Entry/Exit transition;
d) Better use of Meteorological information;
e) Continuous Descent Approaches (CDA) procedures;
f) Continuous Climb procedures;
g) Optimized departure routings;
h) Collaborative decision support systems that increase aircraft taxi time predictability allowing airlines to capitalize on use of fuel saving procedures such as reduced engine taxi out.

5. ACTION BY THE GREPECAS

5.1 The GREPECAS is invited to:

a) note the information presented in this paper with a view to have a decision at the next SAT/FIT meeting;

b) acknowledge the need for collaboration and establishment of synergies between different countries and authorities to improve aviation efficiency; and

c) continue to consider environmental issues in the planning and implementation of regional air navigation systems including the development of new routes, design of terminal procedures and ground movements.

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