International Civil Aviation Organization

SEVENTH MEETING ON THE IMPROVEMENT OF AIR TRAFFIC SERVICES OVER THE SOUTH ATLANTIC (SAT/17)

(Las Palmas - Canarias, Spain, 18 to 20 April 2012)

Agenda Item2: ***Air traffic management (ATM)***

2.5. Any other ATM business

SATISFIED

(Presented by Spain)

SUMMARY

This working paper contains an introduction to the SATISFIED (SAT Improved uSe of Flight corrIdor for Emissions reDuction) project proposal

1. INTRODUCTION

Spain has presented the SATISFIED project In response to SESAR Joint Undertaking (SJU) call LOT1: Oceanic operations: reduced separations for RNP4 equipped aircraft, optimized Oceanic Entry/Exit transition, oceanic trajectory optimization (horizontal, vertical, longitudinal), optimization of the OCEANIC routes, better use of Meteorological information.

2. BACKGROUND

Past projects as Iflex and the continuing AIRE Framework have shown significant savings in fuel consumption and emissions when flexible routes are allowed in OCEANIC control areas (as in the NAT region), without increasing the workload of the operators (ANSPs and Crew).

Currently in the EUR-SAM corridor a very limited number of random routes are available, that improve the routes for very long haul flights (i.e. Santiago de Chile). However, fixed airways are used which do not allow the optimization of the flight profile as prompted by modern flight plan software and aircraft.

3. OBJECTIVES AND KEY ISSUES

The aim of the SATISFEID project proposal is to assess and trial the feasibility of implementing flexible optimized oceanic routes.

Key issues for the project are the following ones:

- Allow for a minimum of 50 flight trials in the EUR-SAM corridor
- Identify and implement flexible routes which allow flying optimized route segments.

- Illustrate the emissions reduction that can be achieved when a limited set of flights are allowed to fly closer to their Optimal Preferred Trajectory or RBT as compared to the current scenario.
- Identify which coordination actions are required between the SAT's Oceanic centre, aircraft operators, flight crews and ATC for the modification of trajectories and stimulate their coordinated interaction.
- Highlight the needs or limitations encountered in the application of the optimized flexible routes, at a pre-flight trial phase and during the flight trials, deliver a feedback.
- Assess through the deployment of flight trials and post flight assessments, the economical, environmental and operational benefits of suing flexible routes.
- Analyse the involved actors' feedback in order to demonstrate that the forecasted benefits can be obtained without increasing the workload on Controllers or Crew.
- Publish the results and stimulate through dissemination and communication the application/extension of flexible routes to all the EUR-SAM Corridor.

4. SCOPE

The scope of the SATISFIED project is the performance and analysis of flexible route flights through the EUR-SAM corridor. The flight trials will be performed for both flows (Northeast direction and South West). During the first phase of the project the different possibilities of Oceanic Areas in which the solution can be fully operational will be evaluated.

GEOGRAPHICAL AND OCEANIC AIRSPACE SCOPE OF THE TRIALS

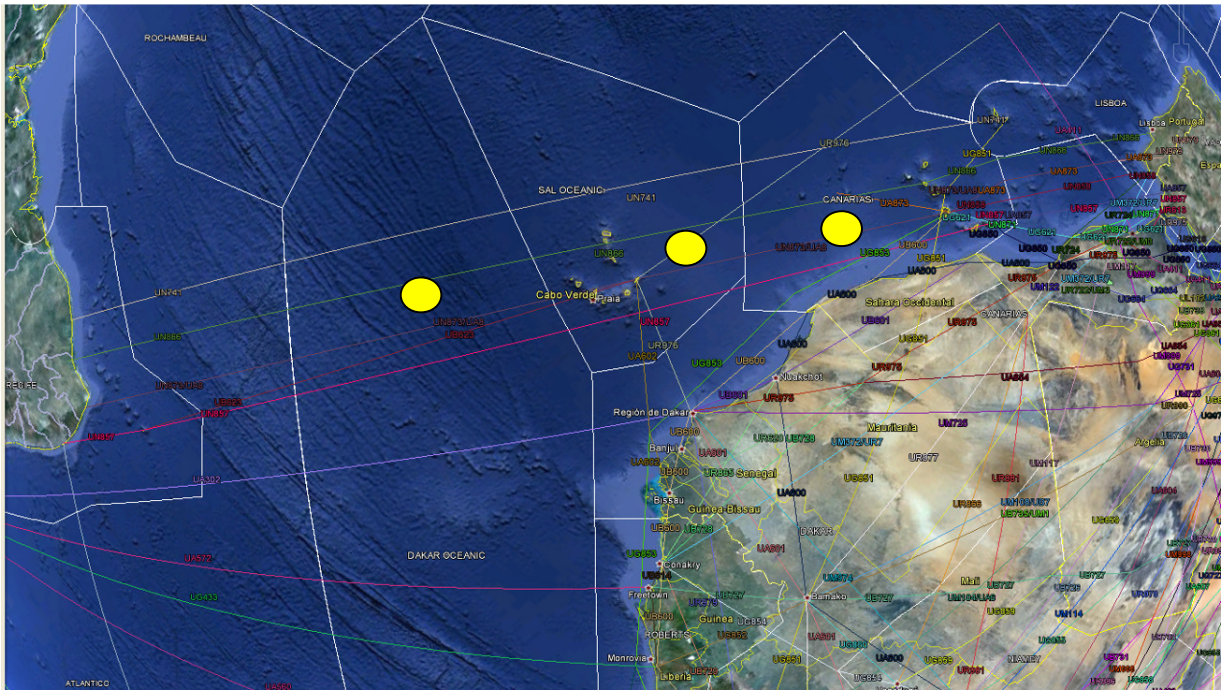

Figure 1 Overview of the EUR-SAM corridor (yellow dot indicate Oceanic Airspaces' concerned)1

1 Image from Google Earth overlaid with AIS/MAP ICAO.

5. PARTICIPANTS IN SATISFIED

3.1 SATISFIED CONSORTIUM

The SAT Improved uSe of Flight corrIdor for Emissions reDuction (SATISFIED) consortium consists of a wide range of respected and highly-experienced companies, each of whom plays a key role in the provision of aviation services in oceanic airspace, which are:

- 1 ANSP (AENA)
- 2 major airlines, (Iberia and Air Europa Líneas Aéreas S.A.U.)
- 1 Civil Aviation Autority (AESA)
- 2 Specialist Aviation Consultancy (INECO and SENASA)

The roles and responsibilities of the consortium members differ between each working package in order to ensure the most appropriate technical expertise for the specific objectives of each WP.

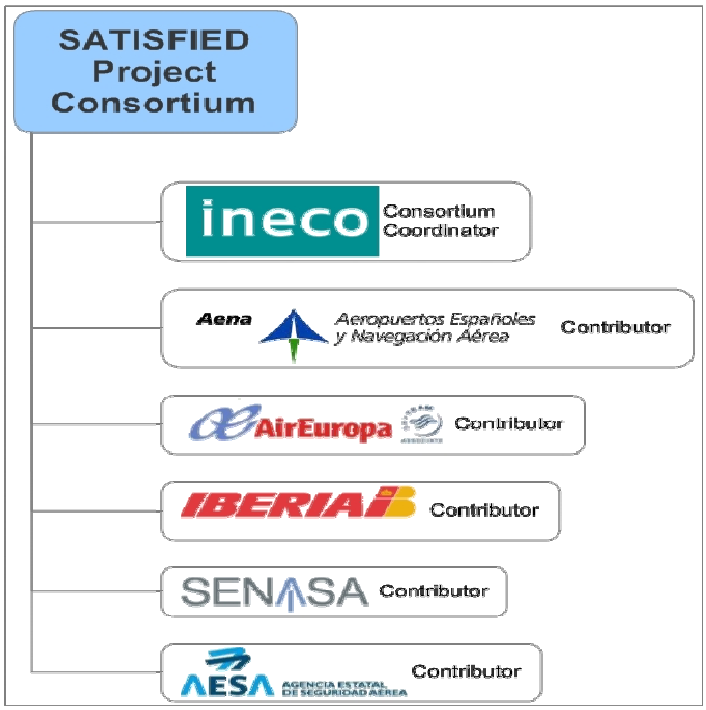

Figure 2 SATISFIED Consortium Members

6. PROJECT PHASES

The project has been divided into two phases:

- Phase 1: DETAILED DEFINITION OF THE PROJECT VALIDATION & COMMUNICATION PLAN

During the first phase of the Project, the proposed demonstration project and related communication plan will be detailed in collaboration with SJU representatives.

- Phase 2: PROJECT VALIDATION and IMPLEMENTATION

During the second phase of the Project, all the activities needed to implement the flight trials, execute them and asses their environmental and economical benefits will be done.

7. PROJECT BREAKDOWN

The project has been broken down into four working packages, as follows:

7.1 WP0: PROJECT MANAGEMENT

The objective of WP0 is to draw up and implement appropriate mechanisms to complete the project on time, with the required quality and making the best possible use of available resources, as well as to maintain the appropriate level of coordination with other related activities.
WP0 is also required to provide and deliver the Final Report to the SJU.

7.2 WP 1: Validation Activities: This work package consists of 3 tasks.

- Validation Plan, which will include:
  - KPIs and calibration indicators;
  - estimation of a baseline for reference;
  - selection of city pairs, time schedule and trials duration;
  - detailed flight trials' procedures and coordination channels;
  - communication and engagement of all the involved actors;
  - definition of data collection process;
  - a full demonstration plan.
- Performance of Trials, which will include:
  - Pre trial Calibration flights;
  - Improvement and tweaking of the possible problems found;
  - Preliminary information channels analysis;
  - Performance of flights;
  - Identification of actual range of trial, limits and mitigation measures;
  - Monitoring of the data collection transfer
  - Monitoring of the feedback transfer from the main actors involved
  - Monitoring of the trials.
- Data Collection and Analysis
  - Collection of the FOQA and Flight Plan data required for the assessment;
  - Sensibility, conformance and quality assurance analysis;
  - Preliminary data processing.
  - Draw learning-curves from flight data performance analysis as inputs for the assessment

7.3 WP 2: Dissemination and Communication: this work package consists of 2 tasks.

- Communication Plan, the main purpose of which is:
  - To raise the awareness of the AIRE programme and its trials.
  - To inform targeted audiences about the context, rationale and mainly the results of the

flight trials.

- To adequately communicate to and engage partners' staff involved in the AIRE programme.
- To adequately communicate to and engage neighboring partners' staff in the AIRE programme.

  Communicate the objectives & activities of the SATISFIED project within and outside the AIRE programme and disseminate the messages in the best way possible to, with and within the stakeholders' organisations.

– WBT (Web Based Training)

The main purpose of which is to elaborate and deliver to the SJU a Web Based Training package describing the project methods. Their contents will include namely the Procedures description (air & ground) to perform the demonstration trials. This package will support the transfer of knowledge across the airlines and Oceanic airspaces', on this type of optimization

7.4 WP 3: Evaluation activities: this work package consists of 2 tasks.

– Flight Data Performance Analysis (FOQA/Flight Plans)
  - Analysis of the performance of the flight trials' (FOQA analysis);
  - Estimation of main indicators (environmental and economical);
  - Statistical evaluation of the results;
  - Check the surrounding conditions of the flight;
  - Analysis of the Flight plan versus actual flight trajectory;
  - Post-flight activities.

– Assessments
  - Operational;
  - Economical;
  - Environmental.

For each assessment the following will be done:

- .. Identification of study detail and expected benefits;
- .. Nº of optimized Routes;
- .. Critical assessment of the actual results towards estimated results;
- .. Measurement of achieved benefits per flight segment;
- .. Measurement of achieved benefits per City Pair segment;
- .. Extrapolation of results to the whole EUR-SAM Corridor;
- .. Extrapolation of the benefits towards the Emissions Trading System (ETS).

8. ACTIONS BY THE MEETING

The SAT17 Meeting is invited to take note of the contents of this working paper.