



**EIGHTEENTH MEETING ON THE IMPROVEMENT OF AIR TRAFFIC SERVICES  
OVER THE SOUTH ATLANTIC**

**(Dakar, Senegal, 17 to 19 July, 2013)**

**Agenda Item 2: Air Traffic Management (ATM)**

**2.2. SATMA report on Traffic Statistics, Safety procedures and operational procedures in the EUR/SAM corridor.**

**“EUR/SAM Corridor Traffic Data for Risk Assessment”**

(Presented by SATMA)

**SUMMARY**

This WP presents a new data criteria for RVSM/RNP10 safety assessment in EUR/SAM corridor to apply the collision risk model to available information, and a proposal of actions to be taken.

**1. BACKGROUND**

SATMA, as monitoring Agency, was committed by SAT group to conduct studies and the required assessments to analyse the conditions for the safe application of RVSM-and RNP10 in EUR/SAM Corridor. The EUR/SAM corridor became an RVSM-RNP10 area in January 2002 after an initial Safety Assessment.

It became mandatory to perform and present periodically an RVSM RNP-10 Post-implementation Analysis about the situation in the EUR/SAM Corridor in order to ensure that critical parameters stay between safe figures and that required Target Level of Safety keeps bellow allowed figures.

Following RMA functions established by ICAO, SATMA has been performing the required periodical Risk Assessment for the Region since RVSM/RNP10 was implemented in the EUR/SAM corridor, under the following criteria.

- a. Two quantitative risk assessments are carried out. The lateral collision risk and the vertical collision risk. The vertical collision risk assessment is split into two parts. The first part considers the risk due to technical causes, whilst the second one considers the risk due to all causes.
- b. The scenario analyzed is the current route network, composed of four nearly parallel north-south routes, (UN-741, UN-866, UN-873 and UN-857), being the two easternmost bidirectional and the other two, unidirectional.
- c. Apart from the traffic on the crossing published routes in the Corridor in SAL, Dakar and Recife (UR-976/UA-602, UL-435 and UL-695/UL-375), traffic that crosses the Corridor using non published routes that carry more than 50 aircraft per year are also considered.
- d. Minimum lateral separation between routes is 110NM for routes UN-741/UN-866, 90NM for routes UN-866/UN-873 and 50NM for routes UN-873/UN-857. Routes UN-741 and UN-866 are unidirectional, with traffic in odd and even flight levels (Southbound traffic on route UN-741 and Northbound traffic on route UN-866).
- e. On the other hand, routes UN-873 and UN-857 are bidirectional. The flight level allocation scheme in these last two routes is the following:
  1. Southbound flight levels: FL300, FL320, FL340, FL360, FL380 and FL400.
  2. Northbound flight levels: FL290, FL310, FL330, FL350, FL370, FL390 and FL410
- f. The risk is evaluated in 6 different locations along the Corridor and an estimation of the collision risk for the next 10 years is calculated, assuming a traffic growth rate per year.

## **DATA SET REQUIREMENTS**

The CRM model approved by ICAO to perform Safety Assessment in RVSM areas is strongly based on Traffic Data and on LHD deviations. So, it is important that this basic Data Set, regarding Deviations and Traffic, is reported properly and on time as a requirement to perform the Risk Assessment.

The following tables show a summary of information received by SATMA since last SAT meeting

Month	SAL Oceanic UIR				Dakar Oceanic UIR				Atlântico-Recife FIR/UIR			
	Traffic		Deviations		Traffic		Deviations		Traffic		Deviations	
	Routes	Crossing	Lateral	Vertical	Routes	Crossing	Lateral	Vertical	Routes	Crossing	Lateral	Vertical
Ene-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Report of "No deviation" received	Report of "No deviation" received
Feb-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Report of "No deviation" received	Report of "No deviation" received
Mar-11	Not available	Not available	Available	Available	Not available	Not available	Not available	Available	Available	Available	Report of "No deviation" received	Report of "No deviation" received
Abr-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Not available	Not available
May-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Available	Available
Jun-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Available	Available
Jul-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Not available	Available
Ago-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Not available	Available
Sep-11	Not available	Not available	Available	Available	Not available	Not available	Not available	Available	Not available	Available	Available	Available
Oct-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Available	Not available	Available
Nov-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Not available	Not available	Available
Dic-11	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available	Available	Not available	Not available	Available

**LEGEND:** Not available      Available      Report of "No deviation" received

Month	SAL Oceanic UIR				Dakar Oceanic UIR				Atlântico-Recife FIR/UIR			
	Traffic		Deviations		Traffic		Deviations		Traffic		Deviations	
	Routes	Crossing	Lateral	Vertical	Routes	Crossing	Lateral	Vertical	Routes	Crossing	Lateral	Vertical
Ene-12	Available	Available	Not available	Available	(*)	(*)	Not available	Available	Available	Available	Not available	Available
Feb-12	Available	Available	Not available	Available	(*)	(*)	Not available	Available	Available	Available	Not available	Available
Mar-12	Available	Available	Not available	(**)	(*)	(*)	Not available	Available	Available	Available	Not available	Report of "No deviation" received
Abr-12	Not available	Not available	Not available	Report of "No deviation" received	(*)	(*)	Not available	Report of "No deviation" received	Available	Available	Available	Report of "No deviation" received
May-12	Available	Available	Not available	Available	(*)	(*)	Not available	Available	Available	Available	Available	Report of "No deviation" received
Jun-12	Available	Available	Not available	Report of "No deviation" received	(*)	(*)	Not available	Available	Available	Available	Not available	Report of "No deviation" received
Jul-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available
Ago-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Report of "No deviation" received
Sep-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Report of "No deviation" received
Oct-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available
Nov-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Available
Dic-12	Not available	Not available	Not available	(**)	Not available	Not available	Not available	Available	Not available	Not available	Not available	Report of "No deviation" received

**LEGEND:** Not available      Available      Report of "No deviation" received

(\*) Data received late for SAT18 assessment (April 2013) and with invalid format  
(\*\*) Data received late for SAT18 assessment (April 2013)

It is remarkable that in the data provided sometimes there is not information of all the needed waypoints and, in some other cases, the information is incoherent. As a result, trajectories and information at required waypoints (i.e., time and FL) have to be assumed, considering the most logical routes and speeds for the extrapolation. On the other hand, the lack of data implies an exponential workload as estimations, hypothesis and data extrapolation are to be done to fit with the model. The more lack of data the more work to do and less confidence in the results. Along SAT meetings SATMA has claimed and urged States to provide information needed to feed the model:

*Conclusion SAT16/05: Data for risk assessment*

*That apart from LHD/LD monthly report, States provide SATMA with data regarding 2010/2011 traffic following, if possible, the DATA models of document “DATA NEEDED FOR EUR/SAM MONITORING AND ASESSEMENTS” published in SATMA website*

*Decision SAT17/01: EURSAM corridor Collision Risk Assessment*

*That SAT States provide SATMA with the air traffic data for the first half of 2011 by end of June 2012, and the data for the second half of 2011 as soon as possible*

Moreover, emails are sent regularly to remind States about this point in order that the schedule may be accomplished. Regrettably, taking into account the lack of information and the delay in data delivery (just a few months before this SAT meeting), the presentation of Safety Assessment report has to be postponed till data from States is delivered to SATMA. In that sense, it is important to remember that DATA models to send the information were included in the document “DATA NEEDED FOR EUR/SAM MONITORING AND ASESSEMENTS” published in SATMA website ([www.satmasat.com](http://www.satmasat.com)) since SAT14. Despite this document being available, different traffic sample data formats have been used in the past to provide information by each State. As a result, tools had to be developed by SATMA to process the information. Therefore, for future assessments, it will not be necessary for states to use the format indicated in that document, but it will be necessary to maintain the format used by each of them for previous assessments<sup>1</sup>.

## **PROPOSAL NEW CRITERIA**

At this point, and taking into account past experience, a review about data and information request becomes necessary. It is essential to introduce some proposals to facilitate and ensure future studies, always keeping into ICAO recommendations.

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<sup>1</sup> As an example, data format for data received from Dakar for the January-June 2012 was different from the format normally used by Dakar and it was difficult to interpret in order to obtain the relevant data for the assessment.

First proposal is to perform the periodical CRM assuming a shorter period (three or four months) but including deviation reports of the whole year. This would result in a limited Safety Assessment as not all data of the whole EUR/SAM Corridor would be included. In summary, SATMA would perform the monitoring of LHDs throughout the year, whereas would perform the collision risk assessment only for the first three months of each year. An approval to proceed this way, is required from the group and the Secretariat

Anyway, here is a summary of *ICAO Document 9574 -AN/934 :Appendix A. "Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive"*,

*A Risk assessment consists of two elements: risk estimation and risk evaluation. Risk estimation refers to the process of determining the expected level of risk that will result from the activity or proposal under consideration. Risk evaluation refers to the process of deciding whether such a level of risk is acceptable.*

*A formal definition of risk requires specification of the units in which it will be measured. For the purpose of collision risk assessment, the units adopted here are fatal accidents per aircraft flight hour .*

*The Risk estimation method consists of using a CRM, which expresses the risk of a mid-air collision in an airspace in terms of a number of quantifiable parameters. The risk evaluation method consists of determining that level of risk which is deemed acceptable, termed the target level of safety (TLS). It is against the TLS that the estimated risk can be compared, providing a quantitative basis for judging the safety of operations in an airspace.*

*The risk of collision to be modelled is that due to the loss of procedural vertical separation between aircraft flying above FL 290 in a given portion of an airspace. One collision between two aircraft is counted as the occurrence of two accidents. The risk of collision depends both on the total number and types of aircraft flying in the system.*

This would reduce the amount of information to be demanded to States and the workload for SATMA in this particular issue.

The number of LHD/LD reported though 2012 has reduced drastically. Some procedures should be emplaced to clarify if it is a real reduction of them or just a relaxation in notification.

## **2. ACTION BY THE MEETING**

The Meeting is invited to:

Take note of the information provided about Safety Assessment in EUR/SAM Corridor Encourage secretariat and the meeting to collaborate with SATMA to make a decision about new criteria for Data Set to star initial studies in 2013, avoiding 2011 and 2012 lack of data

- a) Formulate a conclusion so States send to SATMA January , February and March of 2013 Traffic Data regarding Risk Aessment before August 2013