**Agenda item 3: SAT Collision Risk Assessments (CRA)**

a) ARMA, CARSAMMA and SATMA Activities

# LHD REPORTS – THE EUR/SAM CORRIDOR (2025) UPDATED

(Presented by LHD Reporting Team – The EUR/SAM Corridor)

| SUMMARY | |
|---|---|
| This Information Paper presents the LHD data reported by the LHD Reporting Team, ARMA and CARSAMMA and used by SATMA in the development of the 2025 Collision Risk Assessment (CRA) for the EUR/SAM Corridor.<br><br>The paper also reflects the extension of the CRA scope to include the entire Dakar Oceanic FIR, including DIII airspace, as discussed during IMG/SOG07. | |
| *Strategic Objectives* | - *Safety* |

## 1. Introduction

1.1 In 2025, SATMA received a total of 25 Large Height Deviation (LHD) reports, submitted either by the LHD Reporting Teams of the States and/or ANSPs concerned. These reports were processed within the framework of the collaborative arrangements established among the Regional Monitoring Agencies (RMAs), namely CARSAMMA and ARMA, supporting the safety oversight activities conducted in the EUR/SAM Corridor.

1.2 During IMG/SOG07, SATMA was requested to extend the CRA scope to include the entire Dakar Oceanic FIR. Accordingly, this paper provides an updated analysis of the 2025 reported deviations, taking into account the additional airspace under the responsibility of Dakar Oceanic, including the DIII sector.

## 2. DISCUSSION

2.1. ICAO Doc 9574 RVSM Implementation Manual specifies that ATC authorities are responsible for reporting Large Height Deviations (LHD) to the responsible Regional Monitoring Agency (RMA). The RMA will use this information to assess the overall risk of RVSM airspace as LHDs are among main contributing factors to the risk of mid-air collision.

2.2. ICAO Doc 10063, Manual on Monitoring the Application of Performance-based Horizontal Separation Minima, defines Large Lateral Deviations (LLD) and Large Longitudinal Errors (LLE). Although these events are not currently used as direct inputs to the EUR/SAM Corridor CRA, awareness and reporting of

such occurrences are being promoted through the Navigation Error Investigation Form developed by SATMA and the LHD Reporting Team.

## 3. ANALYSIS

3.1. LHD Reporting Teams analysed all LHD reports received from States and ANSPs, together with those provided by the relevant RMAs (ARMA and CARSAMMA), to assess the overall safety risk of RVSM operations in the EUR/SAM Corridor.

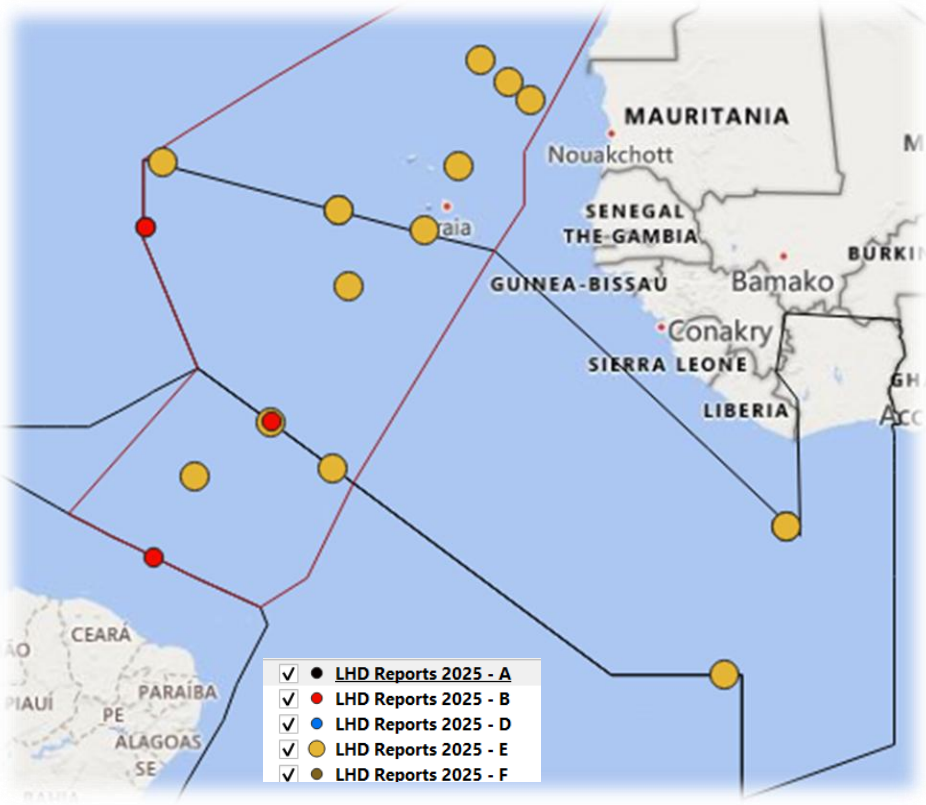
3.2. Six reported deviations were excluded from the assessment as they occurred outside the RVSM airspace within the EUR/SAM Corridor. The analysis indicates a stable safety performance, with no variation observed in the number of reported LHDs.

| AREA | 2025 | % TOTAL | 2024 | VAR % |
|---|---|---|---|---|
| Corridor | 10 | 41.7% | 11 | -10% |
| DCT AREA | 11 | 45.8% | 5 | 55% |
| OUT | 2 | 8.3% | 4 | -100% |
| TOTAL | 23 | - | 20 | 13% |

**Table 1.- Total LHD reports received by SATMA (2025 vs 2024)**
**Table 2.-**

3.3. In the whole of EUR/SAM Corridor there is a strong safety culture based on reporting and providing operational data for the assessment of each occurrence. The effectiveness of this process relies on the active participation of the LHD Reporting Teams and the continued collaboration between SATMA, ARMA and CARSAMMA in collecting, analysing and sharing occurrence data.

3.4. The following picture shows the geographical distribution of the reported LHDs. Although the location of the deviations is not directly relevant to the collision risk assessment, it should be noted that only 58.8% occurred while aircraft were operating on established ATS routes.




**Picture 1.** Localization of LHD deviations in the EUR/SAM Corridor 2025

3.5. Following the analysis of the deviation reports within the assessed airspace, it is concluded that the recorded deviations can be classified in accordance with ICAO definitions and criteria, as outlined below.

| TYPE | 2025 | % | Impact 2025 | 2024 | Impact 2024 |
|---|---|---|---|---|---|
| A | | 0.0% | | | |
| B | 6 | 28.6% | 0 | 2 | 3 FL |
| C | | 0.0% | | | |
| E | 15 | 71.4% | 180 | 15 | 270 |
| F | | | | 1 | |
| TOTAL | 21 | - | 180 | 18 | 270 |

**Table 3.-** Type of deviation analysed by SATMA (2025)

3.6. The most common operational error was E “Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues”, 15 cases (71.4% of the total). This figure is kept although its contribution to risk assessment has been reduced. The main mitigation, of E LHDs, has been ADS-C and CPDLC.

3.7. During the reporting period, six B deviations ("Flight crew climbing/descending without ATC clearance") were recorded. One of these events made a significant contribution to the risk assessment due

to the combination of duration and flight-level occupancy. The main mitigation for B-type LHDs was also ADS-C and CPDLC.

3.8. On the other hand, it can be concluded that their contributing to the risk assessment is the following.

| AFFECTED DEVIATION FIR | YEAR | DURATION (Seg) | DEVIATION (ft) | Number FL (Wrong ) |
|---|---|---|---|---|
| SAT AREA | 2025 | 180 | 2,000 | 0 |
| | 2024 | 270 | 2,000 | 3 |

**Table 4.-** LHD's Contribution to CRA in the EUR/SAM corridor (2025)

## 4.PROPOSAL OF SAFETY PROCEDURES

4.1 The safety recommendations previously presented by LHD Reporting Team remain valid and continue to support the mitigation of navigation-related deviations within the EUR/SAM Corridor. Particular emphasis should be placed on:

- the use of ADS-C and CPDLC, whenever available, to improve situational awareness and facilitate the detection of flight level discrepancies;
- the continued application of SLOP and good operational practices near FIR boundary crossing points;
- timely reporting and investigation of navigation-related occurrences; and
- continued awareness and training initiatives addressing LHD, LLD and LLE events.

4.2 SATMA and the LHD Reporting Team also encourage ANSPs and operators to reinforce training related to CPDLC, PBCS and occurrence reporting in order to further reduce operational deviations.

## 5. NEXT STEPS

5.1 With the planned implementation of PBCS separation minima in portions of the EUR/SAM Corridor from late November 2026, SATMA, in coordination with ARMA, CARSAMMA and the LHD Reporting Team, will progressively extend its occurrence monitoring activities to include Large Lateral Deviations (LLD) and Large Longitudinal Errors (LLE), in addition to the existing monitoring of Large Height Deviations (LHD).

5.2 To support this activity, a Navigation Error Investigation Form has been developed and is presented in the accompanying Working Paper under Agenda Item 3a of this meeting. The form is intended to facilitate the harmonized reporting, investigation and analysis of LHD, LLD and LLE occurrences throughout the EUR/SAM Corridor.

5.3 The collection and analysis of LLD and LLE data will contribute to future Collision Risk Assessments and will support the monitoring of the safe application of performance-based separation minima within the EUR/SAM Corridor.

END