



ICAO

International Civil Aviation Organization  
North American, Central American and Caribbean Office

WORKING PAPER

GTE/24 — WP/07  
16/07/24

**CAR/SAM Planning and Implementation Regional Group (GREPECAS)  
Twenty Fourth Scrutiny Working Group Meeting (GTE/24)  
Mexico City, Mexico, 5 to 9 August 2024**

- Agenda Item 3:**           **Review of the Results of Large Height Deviation (LHD) and the Collision Risk Model (CRM) Analysis**  
3.5       Lessons learned by CAR/SAM States to reduce the number of LHDs.

**GUIDE ON CLASSIFICATION, ANALYSIS AND MITIGATION OF HUMAN ERROR**

(Presented by Dominican Republic)

<b>EXECUTIVE SUMMARY</b>	
This Working Paper presents a proposal from the Dominican Republic on a guide for the classification, analysis and mitigation of human error, related to LHD events.	
<b>Action:</b>	Suggested Actions are described in Section 6
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li><li>• Air Navigation Capacity and Efficiency</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• Guidance Manual for Points of Contact (PoC) accredited to CARSAMMA. Second edition. 2021.</li></ul>

**1. Introduction**

1.1           The main objective of the GTE is the mitigation of events associated with Large Height Deviations (LHDs), however, there is no mechanism to specifically identify the errors associated with these events. It is also important to highlight that according to the analyses carried out by the Monitoring Agency for the Caribbean and South America (CARSAMMA), human error represents more than 90% of the errors that cause LHDs.

1.2           This is why we believe it is a priority to establish some parameters that allow states to identify in the simplest way the points on which they must work to mitigate their occurrence. Considering the above, we propose to establish a Guide that includes the main determining factors in human error, as well as mitigation measures associated with it.

1.3           Likewise, we understand that, due to the confidentiality of the states, it is fair that each one uses this guide taking as reference those items that are reflected in their personal information, with the sole intention of mitigating the occurrence of errors.

## **2. Methodology**

2.1 Voice and radar data recordings were used to identify errors made.

2.2 Brainstorming was carried out on possible reasons that interfere with the mitigation of the events.

2.3 Feedback was carried out on events within the FIR in the period 2020-2024 in order to identify some trends.

## **3. Results**

3.1 After analysing the sample taken, a tabulation of the most common errors was made, resulting in the following:

- Lack of coordination of aircraft that will cross while climbing.
- Language barrier.
- No review of coordinated flight level changes.
- Coordination carried out, but not entered in the system or in the flight progress strips.
- Lack of prioritization of estimates.
- Coordination of erroneous data regarding the flight.
- Background noise.
- Conversations unrelated to coordination.
- Exhaustion.
- Use of electronic devices unrelated to functions.
- Personnel under constant questioning by the supervisor.
- Prolonged time in the coordination position during hours with a high workload.
- Not paying attention to the read back.
- Accumulation of work.
- Inappropriate phraseology.
- Handover with pending coordination.
- Excessive time between the receipt of an estimate and its provision to the next FIR.
- Lack of verification with the ATC and/or pilot about the requested level.
- Lack of data standardization and the correct order to pass the estimates.
- Lack of data standardization and the correct order to collate the estimates.
- Incorrect modulation.
- Prolonged calls with excessive coordination.
- Multiplicity of functions.
- The ATC executive receives estimates.
- Improper use of the headset.

#### 4. Mitigation measures

4.1 After identifying the main errors, it is necessary to work specifically on each of their causes, in order to mitigate the events associated with them.

Cause	Mitigation
Lack of coordination of aircraft that will cross while climbing	Inquiry the crew about the level at which they can cross the TCP and validate compliance with the climb instruction prior to crossing the TCP. Coordinations must be made based on this information and reviewed in the event that it is not met
Language barrier	It must be verified that personnel comply with the minimum requirements established by ICAO and by each of the states
Non review of coordinated flight level changes	The ATC must not make changes to the aircraft's flight levels if it is not within the margins established in the letters of agreement regarding the prior TCP reviews
Coordinations carried out, but not entered in the system or in the flight progress sheet	The coordination made must be reflected in such a way that the ATC can identify any discrepancies
Lack of prioritization of estimates	The transferring unit must carry out the coordination taking into account the estimated time at which these aircraft will cross the TCP
Coordination of erroneous data regarding the flight	It is necessary to validate the data related to the flight before making the necessary coordination
Background noise	It is necessary to maintain an adequate environment for the transfer/reception of estimates
Conversations unrelated to coordination	Avoid personal conversations in coordination
Exhaustion	Verify that the personnel are in optimal conditions to perform their duties
Use of electronic devices unrelated to functions	Create protocols to prohibit/limit the use of these
Personnel under constant questioning by the supervisor	Allow concentration to be maintained on coordination calls and use the appropriate moment for questioning. If necessary, relieve the questioned person from the position to create the necessary space
Extended time in the coordination position during hours with a high workload	Rotate staff between positions of greater/lesser workload
Not paying attention to the read back	Standardize the data required for the snack and maintain concentration to verify its validity
Accumulation of work	Transfer estimates and perform other assigned duties in a timely manner
Inappropriate phraseology	Use the appropriate words, as stipulated in the coordination. An example of this is approving an estimate using the word "Approved" and not "Received"
Handover with pending coordination	It is necessary that, at the time of handover, the smallest amount of pending estimates to be transferred be delivered as possible
Excessive time between receipt of an estimate and provision of it to the next FIR	Estimates, if there's no other priority, must be transferred immediately they are received
Lack of verification with the ATC and/or pilot about the requested level	Level requests must be validated with the flight crew and ATC planning before being transferred to the transferring/accepting unit
Lack of data standardization and the correct order to pass the estimates	The data necessary for the transfer of estimates must be established, such as aircraft identification, time in the TCP, level, SSR code and any other data relevant to the accepting agency
Lack of data standardization and the correct order to collate the estimates	The data necessary for the transfer of estimates must be established, such as aircraft identification, time in the TCP, level, SSR code and any other data relevant to the transferring/accepting unit

Cause	Mitigation
Incorrect modulation	The speed, tone, rhythm and pronunciation must be adequate to avoid misinterpretations in coordination
Prolonged calls with excessive coordination	Accumulation of estimates and overloading calls should be avoided to avoid confusion and/or exhaustion. This type of practice also influences the inability to take estimates from another agency
Multiplicity of functions	It is necessary that coordination functions be exercised without coinciding in space and time with others that do not allow the necessary attention to be paid
The ATC executive receives estimates	In the case where the Control/Planning/Coordination functions are independent, it is necessary that the estimates be transferred and/or received by the position that has said function assigned
Improper use of the headset	It is important to emphasize the correct use of headsets, including the proper position of the microphone for transmitting

## 5. Conclusions

5.1 Each State has its particularities that involve human error, however, it is necessary to identify the trends that exist and address the issue in such a way that the occurrence of deviations can be mitigated.

## 6. Suggested Actions

6.1 The Meeting is invited to:

- a) take into consideration the information provided in this Study Note and the mitigation actions suggested by the Santo Domingo FIR;
- b) recommend that each state continue with the identification of human errors associated with LHDs events;
- c) suggest that the GTE establish a Guide/Manual aimed at human error and its mitigation measures;
- d) promote that States establish mitigation measures in accordance with the errors identified in their FIR and the measures established in the established Manual/Guide;
- e) suggest to the GTE to adopt this Guide/Manual as part of the procedures related to the mitigation of LHDs events; and
- f) take any additional action deemed necessary