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North American, Central American and Caribbean Office

INFORMATION PAPER

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CAR/SAM Planning and Implementation Regional Group (GREPECAS) Twenty Second Scrutiny Working Group Meeting (GTE/22)

Mexico City, Mexico, 26 to 30 September 2022

Agenda Item 3: **Review of the results of Large Height Deviation (LHD) analysis**
3.6 Report on the progress made by States on LHD management

MITIGATING RISKS ASSOCIATED WITH LARGE HEIGHT DEVIATIONS USING DATA DRIVEN DECISION TECHNIQUES

(Presented by Trinidad and Tobago)

EXECUTIVE SUMMARY	
This Information Paper showcases the adoption of a Dashboard by the Air Traffic Services and Air Navigation Services (ATS & ANS) Safety Department of the Trinidad and Tobago Air Navigation Services provider (ANSP) as a visual progress report and data driven decision platform in the mitigation of the risks associated with the occurrence of Large Height Deviations (LHDs).	
Strategic Objectives:	• Safety
References:	• Doc 9574, Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive.

1. Introduction

1.1 A dashboard provides a data summary to the viewer at a glance. It is the consolidation of all the data findings and communicates different perceptive stories to the viewer.

1.2 In LHD Analysis, a dashboard serves as a visual progress report and a check-and-balance aid either as mental reinforcement for Safety or as an information resource platform for data driven decision-making.

2. Methodology

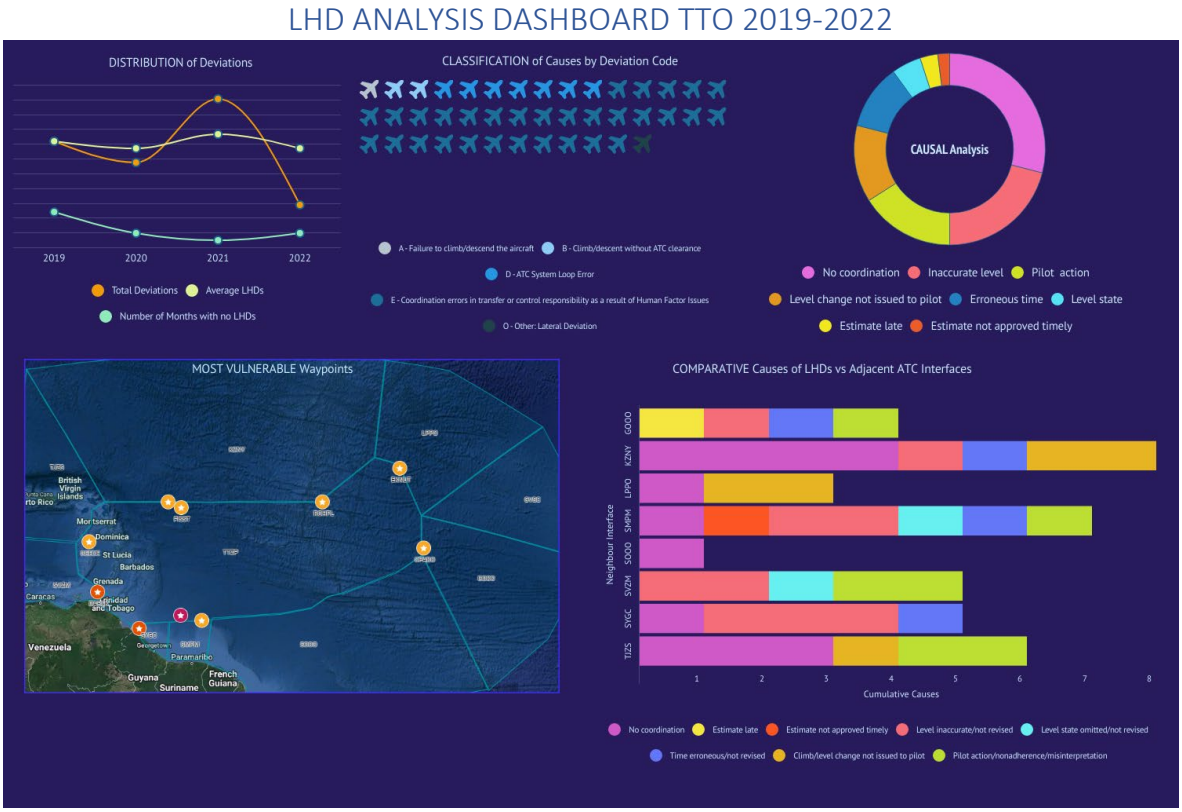
2.1 The data collection starts from March 2019, which is significant for the ANSP. This period coincides with the full transition to an upgraded ATM System and not just COVID-19 Pandemic restrictions to international travel by the government.

2.2 Sources of data include the Incidence/Occurrence reports that Air Traffic Controllers submit in addition to the monthly mandatory reports that the ATS & ANS Safety Unit verifies and sends to CARSAMMA via a spreadsheet and more recently, the WebF4 e-LHD Form.

2.3 The Dashboard is updated monthly. The updates coincide with the deadline for submission for monthly submission of LHD reports on the 15th of the succeeding month. Follow this link for a live interface https://prezi.com/i/c2jipwjluw6f/

2.4 Data is collected and analyzed for descriptive features such as trends in LHD distribution and the most vulnerable Waypoints. The investigative aspects focus on comparative and causal analyses of the risks and prioritizing the adjacent ATC interfaces that require urgent collaborative dialogue about mitigation strategies. The Dashboard will feature a predictive analysis or forecast of LHDs when the data set and period are sufficiently large.

3. Results



4. Discussion

4.1 The trends of the decrease in deviations over time and the corresponding number of increasing months without LHDs are positive aspects for the ANSP.

4.2 However, 79% of the scenarios are attributed to risks associated with the Human Factor aspects in ATC operations or category E of the LHD code classification scheme. Causal analysis of data collected from additional reports reveal that the dominant Human Factors are the non-coordination of estimates and the inaccuracy of the levels.

4.3 The next phase of the causal analysis is to collect data that explains these two human factor scenarios as well as the zero occurrence of LHDs in some months.

4.4 The most vulnerable Waypoints are those where at least 2 Deviations took place. TRAPP is the centre of 5 LHDs while DAREK is the central point of 3 Deviations. The normal response is to meet with the adjacent units where these transfer points are located, discuss and then discuss some more about what can be done or what both parties think should be done both at home and by the adjacent sectors and then if deemed necessary draft a formal understanding.

4.5 However usage of the data platform as an information resource points toward the adjacent ATC interfaces who can gain the most comparatively from adopting specific mitigation strategies in collaboration with Piarco.

4.6 For example, the sector in the South West, SMPM has the most vulnerable Waypoint TRAPP and one other with a combined total of at least 7 LHDs. Yet, comparative analysis points toward the northern sector, KZNY as having the most risk. That sector, has 3 vulnerable transfer control points with a combined total of at least 6 LHDs.

4.7 Both TTZP and KZNY could reduce the risks associated with LHDs by 44% if they either review the coordination process and issuance of Level changes to aircraft at the transfer points of the Continental airspace or reinforce their standardization. A further option is to revamp the transfer processes via technological upgrade with either implementing Air Traffic Services Inter-facility Data Communication (AIDC) or the planned route optimization scheme,

4.8 Likewise, with the SMPM ATC interface, focus will be on creating Safety Nets to ensure that the levels are either accurate/revised timely in the face of challenges from the lack of effective communication tools in the Piarco Flight Information Region.

4.9 In the interim, the Dashboard acts as a visual cue or check-and-balance indicator while the risk mitigation strategies are effected. The data presents visually perceptive stories unique to the viewer but the end goal remains ultimately the same: mental reinforcement of the need to practise Safety in operations.

5. Conclusion

5.1 The Dashboard is an example of using data driven decision techniques in the risk mitigation of LHDs. It provides a consolidation of the data findings in one space. Visual features both describe the trends in distribution and comparatively highlight the risks that require immediate attention. This data visualization platform is also a versatile tool by presenting visually perceptive data stories that act either as mental check-and-balance cues or as information resources for communicative decision-making platforms between adjacent ATC interfaces.

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