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

WORKING PAPER

GTE/22 — WP/05
02/09/22

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
3.4 Identification of trends

IDENTIFICATION OF TRENDS

(Presented by CARSAMMA)

EXECUTIVE SUMMARY

This Paper presents a summary of the trends of some of the Large Height Deviations (LHD) received by CARSAMMA, such as when the aircraft passes the TCP still in ascent or descent, when the aircraft calls at a different point from the coordinated, when the ATS does not check the flight level, point or time of transfer, and the transferring body does not perceive the error, including changes in the estimated time, errors related to transfer failures caused by technical issues of the equipment.

Action:	Suggested actions are included in Section 3.
Strategic Objectives:	• Safety
References:	• Doc 9574, Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive. • Doc 9937, Operating Procedures and Practices for Regional Monitoring Agencies in Relation to the Use of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive. • 2021 Large Altitude Deviations (LHD) Reports

1. Background

1.1 The CAR/SAM Regional Planning and Implementation Group (GREPECAS) delegated to the Caribbean and South American Monitoring Agency (CARSAMMA) the function of receiving, analyzing and codifying the LHDs, presenting them to the GTE, holding teleconferences to validate them, to that information is obtained from these for risk calculations, qualitative (SMS/SGSO) and quantitative (CRM) methods.

1.2 The objective of this work is to bring more information to the experts so that the 2021 LHD reports received by CARSAMMA are observed and analyzed, to prevent that similar situations are repeated, mainly in the specified points, and that the FIR experts involved take the pertinent mitigating actions.

2. Analysis

2.1 Some LHD reports for 2021, first semester and second semester (underlined), had as a coordination failure the final parameter at an intermediate level to the coordinated one, that is, the traffic was still ascending or descending when it called.

2.2. Table 1 shows all the LHD reports that fall into this type of situation, the traffic is coordinated at one level and calls ascending or descending.

Reports 2021	Reporting FIR	FIR that makes the fault	Position	FL
65	LIMA	LA PAZ	ELAKO	FL340 ↗ FL380
84	CURAZAO	BARRANQUILLA	SELAN	FL295 ↗ FL330
121	PIARCO	PARAMARIBO	TRAPP	FL349 ↗ FL400
154	PIARCO	MAIQUETIA	DAREK	FL310 ↗ FL330
166	PANAMA	CENTRAL AMERICA	BUFEO	FL350 ↗ FL370
315	BOGOTA	GUAYAQUIL	ENSOL	FL310 ↗ FL320
342	CURAZAO	ST. DOMINGO	POKAK	FL360 ↗ FL370

Table 1 - Reports of LHD whose transfers are made with a level and calling in ascending or descending

2.3 As observed in Table 1, the FIRs that most reported this failure in 2021 were: Curaçao and Piarco (2 times each). It can also be seen that the pair of Lima x La Paz FIRs, the pair of Curaçao x Barranquilla FIRs and the pair of Curaçao and Santo Domingo FIRs point to coordination failures in both 2020 and 2021.

2.4 Some 2021 LHD reports had the final parameter as a coordination failure, a point different from the coordinated one, that is, the aircraft comes on an airway, changes airway or deviates from the route and that is not reviewed (coordinated again) with the adjacent FIR.

2.5 Table 2 shows all the LHD reports that fit into this type of situation, the traffic is coordinated at one point and calls at another.

Reports 2021	Reporting FIR	FIR that makes the fault	Coordinated Position	Position that the AC calls
35	GUAYAQUIL	BOGOTA	UGUPI	30 NM “NW” UGUPI
59	GUAYAQUIL	BOGOTA	UGUPI	ENSOL
123	LIMA	LA PAZ	DOBNI	VOR JUL
137	BOGOTA	PANAMA	ILTUR	TOKUT
147	GUAYAQUIL	BOGOTA	UGUPI	ANRAX
184	GUAYAQUIL	BOGOTA	ANRAX	UGUPI
189	GUAYAQUIL	BOGOTA	UGUPI	ANRAX
210	GUAYAQUIL	BOGOTA	ANRAX	LIXAS

222	LA PAZ	AMAZONICA	RCO (Rio Branco)	AKVOR
303	PANAMA	CENTRAL AMERICA	BOLDO	PAPIN
320	BOGOTA	GUAYAQUIL	UGUPI	ENSOL
344	MAIQUETIA	BARRANQUILLA	ENPUT	AKNIL
359	GUAYAQUIL	BOGOTA	PLG (Puerto Leguizamo)	31 NM "N" BOKAN
366	AMAZONICA	BOGOTA	ABIDE	BRACO
369	AMAZONICA	BOGOTA	LET (Leticia)	BRACO
450	LIMA	GUAYAQUIL	VAKUD	MOXOM
474	CURAZAO	BARRANQUILLA	OROSA	SELAN
507	SAN JUAN	PIARCO	KEEKA	OPAUL

Table 2 - Reports of LHD whose transfers are made at one point and call at another

2.6 As shown in Table 2, the FIR that reported the most in 2021 was: FIR Guayaquil (7 times) and the most reported FIR was: FIR Bogotá (9 times). The coordinated point that suffered the most change was: UGUPI. If you can also observe that the FIR pair that commits this type of failure the most is: Bogotá x Guayaquil (8 times) and these coordination failures already occurred in 2020.

2.7 Some LHD reports had as a coordination failure the understanding parameter of the flight level, flight number, fix or time, that is, the coordination is done, however the verification is incorrect and the transferring body is not aware of the failure. In the first half of 2021 and in the second half (underlined) we had this type of failure.

2.8 Table 3 shows all the LHD reports that fall into this type of situation, the traffic is coordinated at a flight level and is recorded incorrectly by the adjacent FIR. The flight number, the landline or the time, may also have their annotations made in error, and if so, it was the reason for the LHD report.

Reports 2021	Reporting FIR	FIR that makes the fault	Time, TCP or FL Coordinated	Time, TCP or FL annotated
21	BARRANQUILLA	KINGSTON	FL 310	FL 370
142	ST. DOMINGO	CURAZAO	FL 370	FL 330
146	ST. DOMINGO	PORT AU PRINCE	FL 410	FL 310
498	KINGSTON	BARRANQUILLA	FL 430	FL 360
517	KINGSTON	BARRANQUILLA	FL 320	FL 360

2.9 As can be seen in Table 3, in 2021 we have cases in which some FIR is not aware of what the ATCO of the adjacent FIR is reading back. The Kingston FIR makes the correct transfer on 2 occasions, but does not realize that the read back from the Barranquilla FIR ATCO is incorrect. It can also be seen that the FIR pair that commits this type of fault the most is: Barranquilla x Kingston (3 times).

2.10 Some LHD reports of 2021, first semester and second semester (underlined), had as a coordination failure the parameter related to technical issues of the equipment used for the transfer, (AMHS = ATS MESSAGE HANDLING SYSTEM or AIDC = ATS INTER-FACILITY DATA COMMUNICATION) that is, the traffic calls at a flight level different from the coordinated one or it was not coordinated. This characterizes the code "F" and all the reports below were thus coded due to the description of the LHD report or because they are already coded as "F" by the reporting FIR.

2.11 Table 4 shows all the LHD reports that fall into this type of situation, use of the AIDC or AMHS incorrectly causing automatic coordination failures.

Reports 2021	Reporting FIR	FIR that makes the fault	Position
4	GUAYAQUIL	BOGOTA	UGUPI
6	BOGOTA	PANAMA	ILTUR
7	BOGOTA	PANAMA	KAKOL
8	BOGOTA	GUAYAQUIL	ENSOL
12	GUAYAQUIL	CENTRAL AMERICA	LIXAS
19	GUAYAQUIL	BOGOTA	UGUPI
23	GUAYAQUIL	BOGOTA	UGUPI
25	GUAYAQUIL	BOGOTA	UGUPI
27	GUAYAQUIL	BOGOTA	ENSOL
32	GUAYAQUIL	BOGOTA	BOKAN
35	GUAYAQUIL	BOGOTA	UGUPI
36	GUAYAQUIL	BOGOTA	UGUPI
38	GUAYAQUIL	BOGOTA	UGUPI
39	GUAYAQUIL	LIMA	AMERO
46	GUAYAQUIL	BOGOTA	UGUPI
47	GUAYAQUIL	BOGOTA	BOKAN
49	GUAYAQUIL	BOGOTA	BOKAN
50	BOGOTA	GUAYAQUIL	UGUPI
51	GUAYAQUIL	BOGOTA	UGUPI
52	GUAYAQUIL	BOGOTA	UGUPI
53	GUAYAQUIL	LIMA	VAKUD
55	GUAYAQUIL	BOGOTA	ANRAX
56	GUAYAQUIL	LIMA	VAKUD
59	GUAYAQUIL	BOGOTA	ENSOL
60	GUAYAQUIL	BOGOTA	PULTU
62	GUAYAQUIL	BOGOTA	UGUPI
64	GUAYAQUIL	BOGOTA	UGUPI
66	GUAYAQUIL	BOGOTA	AKTAB
67	GUAYAQUIL	BOGOTA	UGUPI
68	GUAYAQUIL	BOGOTA	UGUPI
69	GUAYAQUIL	BOGOTA	UGUPI
72	BOGOTA	GUAYAQUIL	ENSOL
74	GUAYAQUIL	BOGOTA	UGUPI
81	GUAYAQUIL	BOGOTA	BOKAN
86	GUAYAQUIL	LIMA	AMERO
94	CENTRAL AMERICA	GUAYAQUIL	LIXAS
96	GUAYAQUIL	BOGOTA	UGUPI
99	GUAYAQUIL	BOGOTA	UGUPI
101	GUAYAQUIL	BOGOTA	UGUPI
103	LIMA	GUAYAQUIL	VAKUD
104	GUAYAQUIL	BOGOTA	BOKAN
105	GUAYAQUIL	LIMA	VAKUD

112	GUAYAQUIL	LIMA	VAKUD
115	GUAYAQUIL	BOGOTA	UGUPI
122	GUAYAQUIL	BOGOTA	UGUPI
124	GUAYAQUIL	BOGOTA	PULTU
126	GUAYAQUIL	BOGOTA	UGUPI
127	LIMA	GUAYAQUIL	LOBOT
131	GUAYAQUIL	BOGOTA	UGUPI
132	GUAYAQUIL	BOGOTA	UGUPI
137	BOGOTA	PANAMA	TOKUT
153	PANAMA	BOGOTA	TOKUT
155	GUAYAQUIL	BOGOTA	UGUPI
156	PANAMA	BOGOTA	ILTUR
157	PANAMA	BOGOTA	DAKMO
158	BOGOTA	LIMA	ROLUS
164	GUAYAQUIL	BOGOTA	UGUPI
170	GUAYAQUIL	BOGOTA	PULTU
176	GUAYAQUIL	BOGOTA	PULTU
177	GUAYAQUIL	BOGOTA	UGUPI
181	LIMA	BOGOTA	ILMUX
182	GUAYAQUIL	BOGOTA	UGUPI
183	GUAYAQUIL	BOGOTA	BOKAN
187	LIMA	BOGOTA	ILMUX
188	GUAYAQUIL	BOGOTA	UGUPI
200	GUAYAQUIL	BOGOTA	UGUPI
205	BOGOTA	GUAYAQUIL	UGUPI
210	GUAYAQUIL	BOGOTA	LIXAS
211	GUAYAQUIL	BOGOTA	PULTU
212	GUAYAQUIL	BOGOTA	UGUPI
230	GUAYAQUIL	BOGOTA	BOKAN
231	GUAYAQUIL	BOGOTA	ENSOL
239	PANAMA	CENTRAL AMERICA	PELRA
250	GUAYAQUIL	BOGOTA	UGUPI
251	PANAMA	BOGOTA	TOKUT
253	PANAMA	BOGOTA	ARORO
256	PANAMA	BARRANQUILLA	BOGAL
266	GUAYAQUIL	BOGOTA	UGUPI
267	PANAMA	BOGOTA	BUXOS
268	MERIDA	CENTRAL AMERICA	ASOKU
273	BOGOTA	LIMA	PLG
274	GUAYAQUIL	BOGOTA	ENSOL
275	GUAYAQUIL	LIMA	ARNEL
277	PANAMA	BOGOTA	BUXOS
283	PANAMA	BARRANQUILLA	BOGAL
288	GUAYAQUIL	BOGOTA	UGUPI
289	GUAYAQUIL	BOGOTA	UGUPI
291	GUAYAQUIL	BOGOTA	BOKAN
295	GUAYAQUIL	BOGOTA	PULTU

298	PANAMA	BOGOTA	BUXOS
299	BOGOTA	LIMA	PLG
302	GUAYAQUIL	BOGOTA	UGUPI
314	GUAYAQUIL	BOGOTA	BOKAN
316	CENTRAL AMERICA	PANAMA	ISEBA
322	GUAYAQUIL	BOGOTA	UGUPI
326	GUAYAQUIL	BOGOTA	UGUPI
331	GUAYAQUIL	BOGOTA	BOKAN
339	GUAYAQUIL	BOGOTA	ANRAX
345	GUAYAQUIL	BOGOTA	UGUPI
346	GUAYAQUIL	BOGOTA	UGUPI
350	GUAYAQUIL	BOGOTA	UGUPI
354	GUAYAQUIL	BOGOTA	PULTU
368	GUAYAQUIL	BOGOTA	UGUPI
373	GUAYAQUIL	LIMA	ARNEL
378	CENTRAL AMERICA	GUAYAQUIL	LOGAL
379	GUAYAQUIL	BOGOTA	UGUPI
385	MERIDA	CENTRAL AMERICA	VIDNO
386	GUAYAQUIL	BOGOTA	UGUPI
388	GUAYAQUIL	BOGOTA	BOKAN
401	CENTRAL AMERICA	MERIDA	KATIS
403	PANAMA	BOGOTA	ASEPI
413	GUAYAQUIL	BOGOTA	BOKAN
414	CENTRAL AMERICA	GUAYAQUIL	OSELO
427	GUAYAQUIL	BOGOTA	ENSOL
432	GUAYAQUIL	LIMA	TOSES
436	BOGOTA	LIMA	ROLUS
444	RECIFE	BRASILIA	IMBES
475	GUAYAQUIL	BOGOTA	UGUPI
515	GUAYAQUIL	LIMA	VAKUD
521	GUAYAQUIL	BOGOTA	UGUPI
522	GUAYAQUIL	BOGOTA	BOKAN
541	PANAMA	CENTRAL AMERICA	PELRA
544	BOGOTA	GUAYAQUIL	UGUPI
561	MERIDA	CENTRAL AMERICA	TUGET
567	GUAYAQUIL	BOGOTA	UGUPI
579	GUAYAQUIL	BOGOTA	ENSOL
584	PANAMA	BARRANQUILLA	ALPON
585	GUAYAQUIL	BOGOTA	BOKAN

Table 4 - Reports of LHD whose transfers are made with one level and called in another due to equipment failure

2.12 As can be seen in Table 4, the FIR that reported this type of failure the most in 2021 was: Guayaquil (89 times), Panama (14 times) and Bogotá (12 times). The most reported FIR was Bogotá (89 times). It should be noted that several points are repeated according to the pair of FIRs involved and it can also be seen that the pair of FIRs that most commits this type of failure is: Guayaquil x Bogotá (84 times).

2.13 Some LHD reports for 2021, first semester and second semester (underlined), had the parameter related to re-coordination as a coordination failure, since the traffic is coordinated in one hour and is brought forward.

2.14 Table 5 shows all the LHD reports that fit into this type of situation, the traffic is coordinated in one hour and calls in another, anticipation.

Reports 2021	Reporting FIR	FIR that makes the fault	Position	Coordinated Time	Calling Time	Anticipation / minutes
22	BOGOTA	AMAZONICA	ARUXA	21:25	21:16	9
42	ST. DOMINGO	CURAZAO	KARUM	20:55	20:49	6
43	ST. DOMINGO	CURAZAO	VESKA	13:29	13:24	5
44	PARAMARIBO	PIARCO	TRAPP	20:00	19:42	18
82	LA PAZ	AMAZONICA	RCO	05:41	05:31	10
110	RESISTENCIA	LA PAZ	PILCO	00:19	00:12	7
129	ANTOFAGASTA	LIMA	SORTA	09:49	08:49	60
258	LIMA	LA PAZ	OBLIR	05:17	05:11	6
313	ST. DOMINGO	CURAZAO	VESKA	18:50	18:25	25
318	ST. DOMINGO	CURAZAO	KISAS	21:30	21:20	10
382	MAIQUETIA	AMAZONICA	VAGAN	03:44	02:57	63
384	LA PAZ	AMAZONICA	RCO	23:07	22:46	21
434	LA PAZ	CURITIBA	CUB	12:23	12:16	7
556	GEORGETOWN	PIARCO	KORTO	01:42	01:31	11
573	ST. DOMINGO	CURAZAO	PALAS	03:52	04:00	8
574	ST. DOMINGO	CURAZAO	PALAS	03:55	04:00	5

Table 5 - LHD reports whose transfers are made in one hour and calls in another (anticipation).

2.15 As shown in Table 5, the FIR that most reported this type of failure in 2021 was: Santo Domingo (6 times) and the most reported FIR was Curaçao (6 times). It can also be seen that the FIR pair that commits this type of fault the most is: Santo Domingo x Curaçao (6 times).

2.16 Some LHD reports of 2021, first semester and second semester (underlined), had as a coordination failure the parameter related to coordination made late, close to the TCP, that is, with less than 5 minutes, not complying with the due rule and methodology LHD.

2.17 Table 6 shows all the LHD reports that fall into this type of situation, the traffic is coordinated late, near the TCP.

Reports 2021	Reporting FIR	FIR that makes the fault	Position	Time for the 1st Coordination	Calling time	Coordinated with - Minutes
11	CURAZAO	BARRANQUILLA	OROSA	21:17	21:19	2
26	LIMA	LA PAZ	ORALO	13:56	14:00	4
33	CURAZAO	BARRANQUILLA	OROSA	21:28	21:30	2
85	CURAZAO	ST. DOMINGO	PALAS	20:49	20:53	4

93	LIMA	AMAZONICA	LIMPO	13:29	13:32	3
97	BOGOTA	CENTRAL AMERICA	BOLDO	22:10	22:08	-2
102	CURAZAO	BARRANQUILLA	AMBAS	23:26	23:29	3
114	ST. DOMINGO	CURAZAO	BEROX	08:20	08:22	2
138	ATLANTICO	AMAZONICA	OPVET	14:35	13:35	-60
154	PIARCO	MAIQUETIA	DAREK	00:19	00:22	3
162	GUAYAQUIL	BOGOTA	PULTU	20:38	20:38	0
210	GUAYAQUIL	BOGOTA	LIXAS	22:08	22:09	1
214	GUAYAQUIL	BOGOTA	UGUPI	20:23	20:24	1
229	CURAZAO	KINGSTON	DIBOK	03:49	03:50	1
247	GUAYAQUIL	BOGOTA	UGUPI	22:20	22:20	0
261	EZEIZA	MENDOZA	ARVET	15:50	15:50	0
262	GUAYAQUIL	BOGOTA	VAMOS	09:44	09:44	0
297	GUAYAQUIL	BOGOTA	UGUPI	04:00	04:04	4
335	ST. DOMINGO	CURAZAO	POKAK	18:50	18:52	2
357	GUAYAQUIL	BOGOTA	PULTU	14:09	14:09	0
381	PARAMARIBO	PIARCO	DOLRO	23:38	23:42	4
392	RESISTENCIA	CORDOBA	IREKA	21:39	21:37	-2
394	ST. DOMINGO	CURAZAO	PALAS	07:11	07:15	4
397	MAIQUETIA	BARRANQUILLA	SEMDO	20:29	20:32	3
399	ST. DOMINGO	CURAZAO	KARUM	07:11	07:12	1
441	ST. DOMINGO	CURAZAO	KARUM	06:54	06:56	2
487	PORT AU PRINCE	ST. DOMINGO	ETBOD	19:11	19:16	5
526	ST. DOMINGO	CURAZAO	VESKA	20:25	20:27	2
548	BOGOTA	PANAMA	TOKUT	01:51	01:51	0
559	SAN JUAN	PIARCO	LAMKN	20:19	20:19	0
564	PORT AU PRINCE	ST. DOMINGO	PIGBI	21:29	21:29	0
587	PIARCO	DAKAR	1455N 04448W	12:00	11:00	-60

Table 6 - Reports of LHD whose transit is coordinated late

2.18 As shown in Table 6, the 3 FIRs that most reported this type of failure in 2021 were: Guayaquil (7 times), Santo Domingo (6 times) and Curazao (5 times). The 2 most reported FIRs were: Bogota (7 times) and Curaçao (6 times). The FIR pairs that had this type of failure the most were: Santo Domingo x Curazao (7 times) and Guayaquil x Bogota (7 times).

2.19 Some LHD reports for 2021, first semester, had as a coordination failure the parameter related to the FIRs where the traffic ascended or descended when they were still in their FIRs and coordination for these actions was not carried out.

2.20 Table 7 shows all the LHD reports that fall into this type of situation.

Reports 2021	Reporting FIR	FIR that makes the fault	Position
88	SAN JUAN	MAIQUETIA	KIKER
91	AMAZONICA	BOGOTA	ABIDE
92	AMAZONICA	BOGOTA	ABIDE
180	SAN JUAN	MAIQUETIA	KIKER

Table 7 - Reports of LHDs whose traffic ascended or descended while they were still in the transferring FIR and coordination for these actions was not carried out

2.21 As can be seen in Table 7, the FIRs that most reported this type of fault in 2021 were: San Juan and Amazónica (2 times each) and the most reported were: Bogotá and Maiquetía (2 times each). The positions/points that most frequently reestimated failed were: ABIDE and KIKER (2 times each).

2.22 Some LHD reports for 2021, first semester and second semester (underlined), had the failure to comply with the request made by the accepting FIR.

2.23 Table 8 shows all the LHD reports that fit into this type of situation, when the accepting body requests that the aircraft to be transferred enter a level and the transferring body does not comply with the request.

Reports 2021	Reporting FIR	FIR that makes the fault	Requested FL	Actual FL
215	ST. DOMINGO	CURAZAO	FL 330	FL 350
462	CURAZAO	BARRANQUILLA	FL 350	FL 370
505	ST. DOMINGO	CURAZAO	FL 360	FL 370

Table 8 - LHD reports whose transferring body does not meet the request of the accepting body.

2.24 As shown in Table 8, the FIR that most reported this type of fault in 2021 was: Santo Domingo (2 times) and Curaçao was the most reported FIR (2 times).

2.25 Some LHD reports for 2021, in the first semester, failed in the coordination carried out by the transferring FIR.

2.26 Table 9 shows all the LHD reports that fall into this type of situation, when the transfer body coordinates the wrong aircraft. He transfers the aircraft to the receiving body and does not realize the mistake made.

Reports 2021	Reporting FIR	FIR that makes the fault	Coordinated AC	Calling AC
82	LA PAZ	AMAZONICA	AAL907	AVA097
107	PARAMARIBO	GEORGETOWN	-	UAL62

Table 9 – LHD reports whose transferring body coordinates the wrong aircraft

2.27 As shown in Table 9, we had two reports, where FIR AMAZONICA and FIR GEORGETOWN coordinated the transfer of the wrong aircraft.

3. Suggested action.

3.1 The Meeting is invited to:

a) Take note of the analysis presented in this Working Paper and that the States use it as a reference for the mitigation of their LHD reports; and

b) Submit said decision to the members of the GTE for their knowledge and approval.

— END —