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COMISIÓN DE
INVESTIGACIÓN
DE ACCIDENTES
E INCIDENTES DE
AVIACIÓN CIVIL

Report IN-023/2013

Incident involving a Piaggio P-180 "Avanti II" aircraft, registration D-IVIN, operated by AirGo Flugservice, and a Boeing B-767-300 aircraft, registration G-TCCA, operated by Thomas Cook Airlines Ltd., on 20 July 2013 on the GALAT2R SID at Palma de Mallorca (Illes Balears, Spain), near point GALAT

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Foreword

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission (CIAIAC) regarding the circumstances of the accident object of the investigation, and its probable causes and consequences.

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with articles 5.5 of Regulation (UE) n.º 996/2010, of the European Parliament and the Council, of 20 October 2010; Article 15 of Law 21/2003 on Air Safety and articles 1, 4 and 21.2 of Regulation 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future civil aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent from their reoccurrence. The investigation is not pointed to establish blame or liability whatsoever, and it's not prejudging the possible decision taken by the judicial authorities. Therefore, and according to above norms and regulations, the investigation was carried out using procedures not necessarily subject to the guarantees and rights usually used for the evidences in a judicial process.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

Table of contents

Abbreviations vii

Synopsis ix

1. Factual Information 1

1.1. History of the flight 1
1.2. Injuries to persons 1
1.2.1. Aircraft XGO 5LD 1
1.2.2. Aircraft TCX 14RL 2
1.3. Damage to aircraft 2
1.4. Other damage 2
1.5. Personnel information 2
1.5.1. Information on the crew of aircraft XGO 5LD 2
1.5.2. Information on the crew of aircraft TCX 14RL 2
1.5.3. Information on ATC personnel 3
1.6. Aircraft information 3
1.6.1. General information on aircraft XGO 5LD 3
1.6.2. General information on aircraft TCX 14RL 3
1.7. Meteorological information 3
1.8. Aids to navigation 3
1.8.1. Information taken from the SACTA System 3
1.9. Communications 4
1.10. Aerodrome information 5
1.11. Flight recorders 5
1.11.1. Flight recorders on aircraft TCX14RL 5
1.11.2. Flight recorders on aircraft XGO5LD 5
1.12. Wreckage and impact information 5
1.13. Medical and pathological information 6
1.14. Fire 6
1.15. Survival aspects 6
1.16. Tests and research 6
1.16.1. Report from the crew of aircraft TCX 14RL 6
1.16.2. Report from the crew of aircraft XGO 5LD 6
1.16.3. Statements from ATC personnel 6
1.16.3.1. Statements from the tactical controller 6
1.16.3.2. Statement from the planning controller 7
1.17. Organizational and management information 7
1.18. Additional information 8
1.18.1. Operations Manual of the Palma Area Control Center 8
1.18.2. Conflict Alert Function of the SACTA System 10
1.19. Useful or effective investigation techniques 10

2. Analysis 11

2.1. General Information 11
2.2. History of the flight 11
2.3. Personnel actions 12
2.4. Sector DEO at the Palma ACC 12
2.5. Conflict detection 13

3. Conclusion 15

3.1. Findings 15
3.2. Cause 15

4. Safety Recommendations 17

Abbreviations

00:00	Hours and minutes (period of time)
00:00:00	Hours, minutes and seconds (chronological time)
00°	Geometric degree(s) / Magnetic heading
ACC	Area Control Center
AMSL	Above Main Sea Level
ATC	Air Traffic Control
ATPL(A)	Air transport pilot licence (airplane)
CPL(A)	Commercial Pilot License (airplane)
dd/mm/aaaa	Day, month and year (date)
DEP	Departure sector Palma area control center
EGCC	Manchester airport ICAO code (UK)
FL	Flight Level
ft	Feet
ft/min	Feet per minute
GS	Ground speed
h	Hour(s)
JAR-FCL	Joint Aviation Regulations - Flight Crew Licenses
km	Kilometre(s)
kt	Knot(s)
LEPA	Palma de Mallorca airport ICAO code (Spain)
LFLD	Bourges airport ICAO code (France)
m	Meter(s)
NM	Nautical(s) mile(s)
RA	Resolution advisory
SACTA	Automated Air Traffic Control System (Sistema automatizado de control de tránsito aéreo)
SID	Standard Instrumental Departure
STCA	Short Term Conflict Alert
TA	Traffic Advisory
TCAS	Traffic alert and Collision Avoidance System
TWR	Tower
UTC	Coordinated Universal Time

Synopsis

Aircraft XGO 5LD

Owner and operator:	AirGo Flugservice GmbH
Aircraft:	PIAGGIO P-180 "Avanti II", registration D-IVIN
Persons onboard:	5; 2 crew and 3 passengers, none
Type of flight:	Commercial air transport – Air taxi
Phase of flight:	Climb

Aeronave TCX 14RL

Owner and operator:	Thomas Cook Airlines, Ltd.
Aircraft:	BOEING B-767-300, registration G-TCCA
Persons onboard:	334; 11 crew and 323 passengers, none
Type of flight:	Commercial air transport – Non-scheduled – International – Passenger
Phase of flight:	Climb

Date and time of incident:	Saturday, 20 July 2013; at 10:12 h[1]
Site of incident:	SID GALAT2R at Palma de Mallorca, near point GALAT
Date of approval:	27 November 2014

Summary of incident

The Piaggio P-180 "Avanti II" aircraft, registration D-IVIN, was on flight XGO 5LD from the Palma de Mallorca Airport (LEPA) in the Balearic Islands, Spain, to the Bourges Airport (LFLD) in France, while the Boeing B-767-300, registration G-TCCA, was on flight TCX 14RL from the same airport to the Manchester Airport (EGCC) in the United Kingdom.

The two aircraft took off from runway 06R at the Palma de Mallorca Airport, flight XGO 5LD at 10:02:13 and flight TCX 14RL at 10:06:23. Both were on standard instrument departure (SID) GALAT 2R outbound from the airport.

Both aircraft were in radar and radio contact with sector DEO of the Palma Area Control Center (ACC) while, at 10:12, when aircraft TCX 14RL was near point GALAT and climbing through flight level (FL) 190, its crew received a traffic advisory (TA) on its Traffic Alert and Collision Avoidance System (TCAS). At the same time they were instructed

[1] All times in this report are in UTC. To obtain local time add two hours to UTC.

by ATC to turn right to heading north. After starting the turn, the crew received a descent resolution advisory (RA) from the TCAS, to which they responded as directed. Aircraft XGO 5LD, which was already in contact with the Barcelona ACC, also received a TCAS traffic advisory coincident with the TCAS advisory issued on the TCAS onboard TCX 14RL.

The investigation determined that the incident occurred when the DEO sector of the Palma ACC cleared aircraft TCX 14RL to climb to the same flight level as that previously authorized for aircraft XGO 5LD, which preceded it.

The performance of aircraft TCX 14RL exceeded that of XGO 5LD, which caused the separation between the two aircraft to be excessively reduced. The late detection of this situation resulted in ATC ordering the former to carry out an evasive maneuver and a resolution advisory being issued on its TCAS.

As a result of the investigation two safety recommendations addressed to ENAIRE, manager of air navigation in Spain, have been issued.

1. FACTUAL INFORMATION

1.1. History of the flight

The Piaggio P-180 "Avanti II" aircraft, registration D-IVIN, was on flight XGO 5LD from the Palma de Mallorca Airport (LEPA) in the Balearic Islands, Spain, to the Bourges Airport (LFLD) in France.

The Boeing B-767-300, registration G-TCCA, was on flight TCX 14RL from the same airport to the Manchester Airport (EGCC) in the United Kingdom.

The two aircraft took off from runway 06R at the Palma de Mallorca Airport, flight XGO 5LD at 10:02:13 and flight TCX 14RL at 10:06:23. Both were on standard instrument departure (SID) GALAT 2R outbound from the airport.

Both aircraft were in radar and radio contact with sector DEO of the Palma Area Control Center (ACC), the result of combining the Departure (DEP) sector with the OXX sector, which was operational at the time.

At 10:12, while aircraft TCX 14RL was near point GALAT and climbing through flight level (FL) 190, its crew received a traffic advisory (TA) on its Traffic Alert and Collision Avoidance System (TCAS). At the same time they were instructed by ATC to turn right to heading north. After starting the turn, the crew received a descent resolution advisory (RA) from the TCAS, to which they responded as directed. Upon initiating the turn they saw the preceding traffic and continued with the maneuver. The TCAS advisory then instructed them to "Adjust vertical speed" before eventually announcing "Clear of conflict".

Aircraft XGO 5LD, which was already in contact with the Barcelona ACC, also received a TCAS traffic advisory coincident with the TCAS advisory issued on the TCAS onboard TCX 14RL.

1.2. Injuries to persons

1.2.1. *Aircraft XGO 5LD*

Injuries	Crew	Passangers	Total in the aircraft	Others
Fatal				
Serious				
Minor				Not applicable
None	2	3	5	Not applicable
TOTAL	**2**	**3**	**5**	

1.2.2. *Aircraft TCX 14RL*

Injuries	Crew	Passangers	Total in the aircraft	Others
Fatal				
Serious				
Minor				Not applicable
None	11	323	334	Not applicable
TOTAL	**11**	**323**	**334**	

1.3. Damage to aircraft

None of the aircraft was damaged.

1.4. Other damage

There were no other damage.

1.5. Personnel information

1.5.1. *Information on the crew of aircraft XGO 5LD*

The captain of aircraft XGO 5LD, a 31-year old Dutch national, had a valid and in force JAR-FCL Commercial Pilot License (CPL (A)). He also had a valid and in force class 1 medical certificate.

The first officer of aircraft XGO 5LD, a 30-year old French national, had a valid and in force JAR-FCL Commercial Pilot License (CPL (A)). He also had a valid and in force class 1 medical certificate.

1.5.2. *Information on the crew of aircraft TCX 14RL*

The captain of aircraft TCX 14RL, a 45-year old British national, had a valid and in force JAR-FCL Airline Transport Pilot License (ATPL (A)) and a valid B767 rating. He also had a valid and in force class 1 medical certificate. He had a total of 11,000 flight hours.

The first officer of aircraft TCX 14RL, a 54-year old British national, had a valid JAR-FCL Airline Transport Pilot License (ATPL (A)) and a valid B767 rating. He also had a valid and in force class 1 medical certificate. He had a total of 13,410 flight hours.

1.5.3. *Information on ATC personnel*

During the event, the DEO sector (Departures + OXX) at the Palma ACC was manned by a tactical controller and a planning controller.

The tactical controller, a 58-year old Spanish national, had a valid and in force air traffic controller license and medical certificate, as well as the required unit endorsements.

The planning controller, a 47-year old Spanish national, had a valid and in force air traffic controller license and medical certificate, as well as the required unit endorsements.

1.6. Aircraft information

1.6.1. *General information on aircraft XGO 5LD*

The aircraft with registration D-IVIN, a Piaggio P-180 "Avanti II" with serial number 1159, was outfitted with two Pratt & Whitney Canada PT6A-66 engines. The aircraft had a valid and in force certificate of airworthiness and had been maintained in keeping with its approved maintenance program.

1.6.2. *General information on aircraft TCX 14RL*

The aircraft with registration G-TCCA, a B767-31K with serial number 27205, was outfitted with two General Electric CF6-80C2B7F engines. The aircraft had a valid and in force certificate of airworthiness and had been maintained in keeping with its approved maintenance program.

1.7. Meteorological information

Not applicable. The weather conditions were appropriate for the operation of the two aircraft.

1.8. Aids to navigation

All navigation aids that support the GALAT 2R instrumental departure, which was followed by both aircraft, were operational on the day the incident occurred.

1.8.1. *Information taken from the SACTA System*

The Palma Control Center has a SACTA system for processing flight data. The area in which the two aircraft were flying was under radar coverage.

The radar information taken from the SACTA system shows that at 10:09:46, the aircraft were separated horizontally by 8.7 NM and vertically by 4,600 ft.

Then, at 10:11:08, the distances between the aircraft were 7.6 NM and 4,700 ft, with aircraft XGO 5LD climbing through FL 169 and aircraft TCX 14RL climbing through FL 122. The Palma ACC then cleared aircraft TCX 14RL to climb to FL 280.

By 10:12:30, as XGO 5LD was being transferred to the frequency of the Barcelona ACC, the separation between the aircraft had dropped to 4.3 NM horizontally and 4,300 ft vertically.

At 10:13:18 the aircraft were 2.7 NM and 800 ft apart. It was then that the controller in the Palma ACC instructed aircraft TCX 14RL to turn heading north.

The minimum vertical separation between the aircraft was 300 ft, at which time aircraft TCX 14RL stopped its climb and even started to descend. At that moment the horizontal separation was 1.3 NM.

The minimum horizontal separation between the aircraft was 0.5 NM, at which time the vertical separation was 1,000 ft.

The radar data show that aircraft XGO 5LD was flying at a ground speed (GS) of between 210 and 220 kt, while aircraft TCX 14RL was gradually increasing its speed until it reached a GS of 370 kt.

1.9. Communications

Both aircraft were in contact on frequency of the Palma ACC DEO Sector (a sector formed by the combination of the Departures and OXX Sectors) after taking off from runway 06 at the Palma de Mallorca Airport. Aircraft XGO 5LD contacted at 10:03:18 and was cleared to climb to FL 100, and three minutes later to FL 120. Aircraft TCX 14RL then made contact on the frequency to report that it was on standard departure SID GALAT2R and climbing to 6,000 ft. After informing of radar contact, the Palma ACC cleared it to climb to FL 100.

At 10:07:18, the Palma ACC instructed aircraft XGO 5LD to fly direct to point GALAT and, a few seconds later, to climb to FL 280.

Two minutes later, at 10:09:06, the Palma ACC cleared aircraft TCX 14RL to climb to FL 140 and then, after being requested by the crew, to fly direct to point GALAT. Two minutes later the crew of aircraft TCX 14RL requested to climb to a higher altitude as it was reaching its cleared altitude of FL 140. The Palma ACC cleared them to climb to FL 280.

At 10:12:30 the Palma ACC transferred aircraft XGO 5LD to the Barcelona ACC.

A few seconds later, at 10:13:19, the Palma ACC instructed aircraft TCX 14RL to turn right heading north, and some seconds later to continue turning right to heading 020°. The crew then reported that its TCAS had alerted and was issuing a resolution advisory. The Palma ACC instructed the crew to hold FL 210 upon reaching it, followed a few seconds later by a new clearance to fly direct to GALAT at FL 220.

During a station-to-station call, the Barcelona ACC controller informed the controller in the Palma ACC that aircraft XGO 5LD had received a traffic advisory on its TCAS.

It should be noted that between 10:03:18 and 15:15:48, sector DEO in the Palma ACC had 12 different aircraft under its control.

1.10. Aerodrome information

The Palma de Mallorca airport (LEPA) is located 8 km east of the city of Palma de Mallorca in the Balearic Islands, Spain. With an elevation in its point of reference of 8 m (27 ft) it has two parallel asphalt runways, with orientation 06/24 and dimensions 3,270 × 45 m for the 06L/24R and 3,000 × 45 m for the 06R/24L.

There are five standard instrument departures (SID) published to departure from runway 06R, among which is the 2R GALAT which was followed by the two aircraft.

1.11. Flight recorders

1.11.1. *Flight recorders on aircraft TCX14RL*

Due to the time that elapsed between the date of the incident and its being reported to the CIAIAC, it was impossible to recover the information from the flight recorders onboard aircraft TCX 14RL.

1.11.2. *Flight recorders on aircraft XGO5LD*

Due to the time that elapsed between the date of the incident and its being reported to the CIAIAC, it was impossible to recover the information from the flight recorders onboard aircraft XGO 5LD.

1.12. Wreckage and impact information

Not applicable.

1.13. Medical and pathological information

Not applicable.

1.14. Fire

There were no fire.

1.15. Survival aspects

Not applicable.

1.16. Tests and research

1.16.1. *Report from the crew of aircraft TCX 14RL*

The crew of aircraft TCX 14RL stated in their report that while climbing to FL 280 en route to point GALAT at a climb rate of about 4,000 ft/min, they received a traffic advisory on their TCAS. At the same time they were instructed by ATC to turn to heading 360°. After starting the turn, a TCAS descent RA was received, and they responded in keeping with their company's standard procedures. They established visual contact with the aircraft (a small turboprop aircraft), which was climbing some 5 NM ahead of them at their 11 o'clock position, so they continued with their turn as instructed. The TCAS resolution advisory then changed to "Adjust Vertical Speed" before reporting "Clear of Conflict" a short time later.

1.16.2. *Report from the crew of aircraft XGO 5LD*

The crew of aircraft XGO 5LD stated that when they changed to the Barcelona ACC frequency, they received a TA on their TCAS due to an aircraft approaching from behind and below them, which they reported to the Barcelona ACC.

A short time later they were in visual contact with the aircraft, which was going from behind them to their right and crossing their flight level. They reported this once more to the Barcelona ACC, which informed them that they were not in contact with this aircraft.

1.16.3. *Statements from ATC personnel*

1.16.3.1. Statements from the tactical controller

The tactical controller stated in his report that he started working in the Departures Sector for runway 06, which was combined with the OXX Sector later to reduce the

workload on another sector that was very busy. This meant that from then on, he was controlling aircraft from takeoff until FL 280, at which point they were transferred to the Barcelona ACC, and until the limit between the areas controlled by the Palma and Barcelona ACCs. In his opinion, this configuration is problematic as it requires concentrating on distant points with significant potential for conflict situations.

He also stated that after aircraft XGO 5LD took off, he monitored the aircraft on its standard departure until it was cleared to the level where it would be transferred to the Barcelona ACC (FL 280). At that time there was still a lot of departing traffic of different types and via different departures. These takeoffs included that of aircraft TCX 14RL, which was flying on the same route. The aircraft was cleared to different levels until it was cleared to FL 280, since he thought the vertical separation between the aircraft was sufficient. After that he concentrated on other aircraft that were taking off. At one point he noticed that due to its speed and climb rate, aircraft TCX 14RL was reaching aircraft XGO 5LD, which initially had a normal climb rate but which was decreasing. He then gave evasive instructions to aircraft TCX 14RL which, as it was carrying out the evasive maneuver, reported that it was receiving a TCAS advisory and that it had the traffic in sight.

The controller stated that the momentary lapse in attention was due basically to the grouping of sectors and to the large number of aircraft and of communications that were taking place, as he had to handle aircraft in various points that were far apart geographically.

Lastly he stated that the situation was handled normally by both himself and by the pilot.

1.16.3.2. Statement from the planning controller

The planning controller stated that the aircraft TCX 14RL and XGO 5LD approached each other because the speed and climb rate were going down in the latter and up in the former. He added that the OXX and Departures sectors had been combined, which required the controller to pay more attention to separate and remote geographic areas, to the takeoff sequence and to aircraft at high levels.

As the planning controller he was focused on the takeoff sequence, on updating the flight progress strips and on coordinating with other sectors.

1.17. Organizational and management information

Not applicable.

1.18. Additional information

1.18.1. *Operations Manual of the Palma Area Control Center*

In the course of the incident, aircraft were flying in an airspace that was the responsibility of the Palma ACC, in the airspaces called Departures (DEP) and OXX, which at that time were combined to form sector DEO. A single controller was thus in effect responsible for both sectors.

Sector DEP is responsible for handling takeoffs given to it from the tower, and is part of the Approach Center. Its main mission is to control all takeoffs transferred from the TWR at the Palma airport and to transfer them in turn to the corresponding adjacent sector (figure 1).

Volume OXX is an independent volume that can be added to other sectors to balance traffic loads. It has no assigned radio frequency as it always uses that of its associated sector. It provides a useful alternative for Flow Control.

In Flow Control terms, sector OXX is a "collapsed" sector, meaning it is always joined to another sector.

Volume OXX consists of two sub-volumes (figure 2):

X: From 1,000 ft AMSL to FL245.
Y: From 1,000 ft AMSL to FL185.

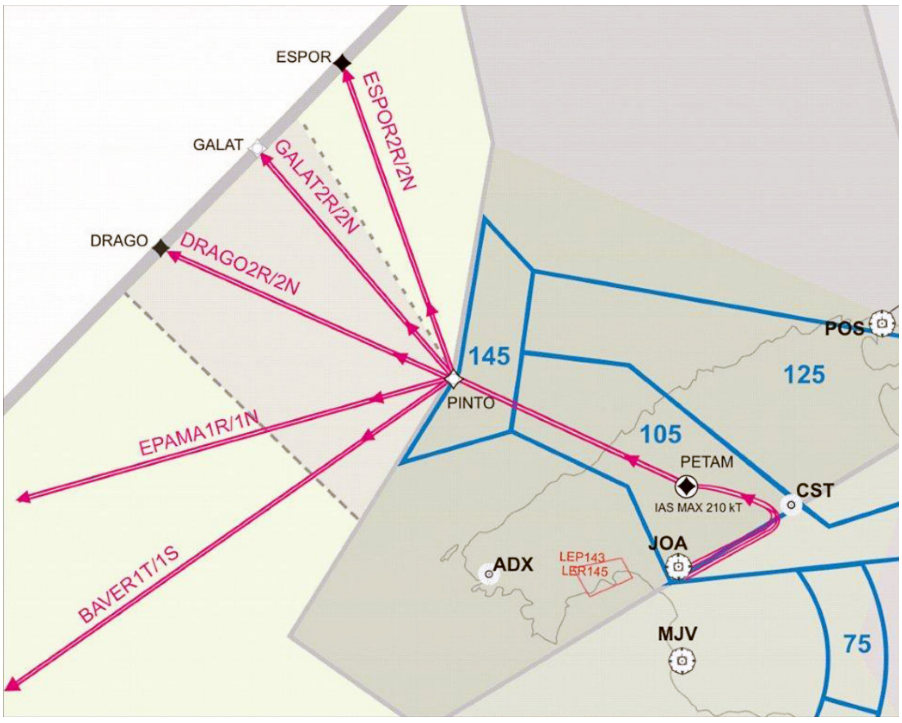

Figure 1

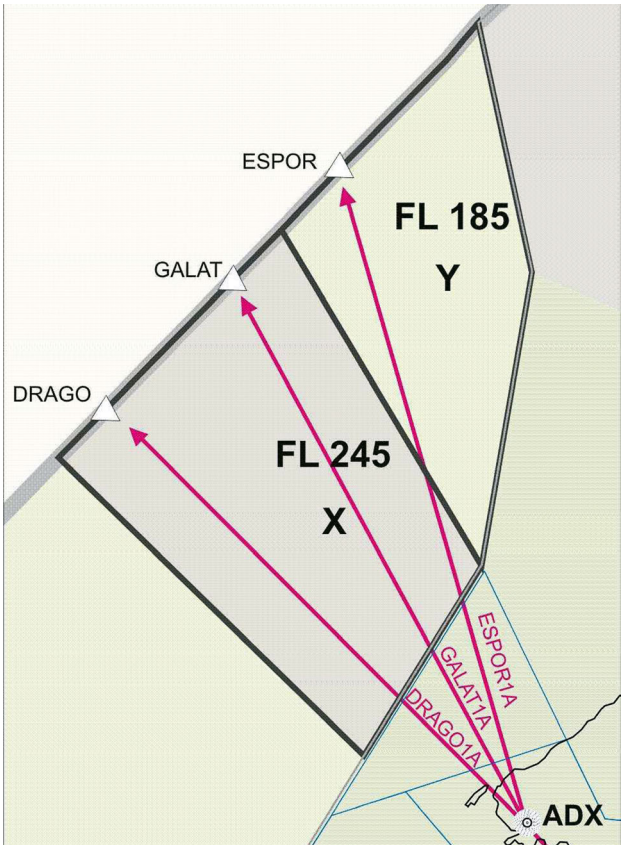

Figure 2

Sector OXX is adjacent to the Barcelona ACC, and transfers to said ACC adhere to the following criteria:

SECTOR	TRANSFERIRÁ POR	A FL	A
F1O DEO DWO	GALAT (RWY 24/06)	280*	LECB
	DRAGO (RWY 24/06)	280*	LECB
	ESPOR (RWY 24/06)	180	LECB
	EPAMA y BAVER (RWY06)	180	GXX
DWX	DRAGO, GALAT, ESPOR	140	OXX

* Climbing to FL280.

Therefore, sector DEO must transfer to the Barcelona ACC those aircraft that are climbing through point GALAT and are cleared to FL 280.

The following conditions also apply:

- The second aircraft, with a speed equal to or less than the first, may be transferred to the same flight level or in evolution if it maintains a minimum distance of 10 NM.
- Successive aircraft that cannot hold the 10 NM distance shall be cleared to available lower levels as coordinated with the ACC.

1.18.2. *Conflict Alert Function of the SACTA System*

The SACTA system features a Short-Term Conflict Alert (STCA) function that is designed to aid controllers in preventing collisions between aircraft by issuing alerts when a potential or actual violation of separation minimums is detected. This function can be turned on or off at a specific console or for specific volumes of airspace.

In the case of the airspace under the responsibility of the Palma ACC, the function is not available. Due to the nature of the operations that take place in this type of airspace (departures, arrivals, holding patterns, etc., with fluctuating, short-term traffic), the STCA function as it stands now yields a large number of nuisance conflict alerts when activated, which considerably increases the workload of ATC personnel.

1.19. Useful or effective investigation techniques

None has been used during this investigation.

2. ANALYSIS

2.1. General Information

On 20 July 2013, the aircraft on flights XGO 5LD and TCX 14RL took off from runway 06R at the Palma de Mallorca Airport, the former at 10:02:13 and the latter at 10:06:23. Both were on standard instrument departure GALAT 2R in radio and radar contact with sector DEO of the La Palma ACC.

At 10:12, with aircraft XGO 5LD already in contact with the Barcelona ACC, the crews of both aircraft received a traffic advisory on their respective TCAS as aircraft TCX 14RL was near point GALAT and climbing through FL 190 and was being instructed by ATC to turn right heading north.

After starting the turn, TCX 14RL received a descent resolution advisory on its TCAS, to which its crew reacted as directed. Upon starting the turn they saw the preceding traffic and continued the maneuver. The crew of aircraft XGO 5LD, in turn, had visual contact with the aircraft that was following them, which was going from behind them to their right and crossing their flight level

2.2. History of the flight

The two aircraft took off on runway 06R at the Palma de Mallorca Airport 4:10 minutes apart and followed the same standard departure SID, GALAT 2R.

Transferred by the control tower, both contacted sector DEO from very similar positions and 3:15 minutes apart.

They were cleared one after the other, first to proceed direct to point GALAT and then to climb to FL 280.

As a result, both aircraft were on the same horizontal flight path, separated in altitude due to their different takeoff times and to their different performance.

Aircraft XGO 5LD, a light turboprop, had a ground speed of between 210 and 220 kt and a climb rate of 2,500 ft/min, whereas TCX 14RL gradually increased its speed until it reached a GS of 370 kt and a climb rate of about 4,000 ft/min.

In these circumstances, aircraft TCX 14RL gradually approached XGO 5LD until it practically reached it at around FL 210.

Aircraft TCX 14RL started an evasive maneuver, initially following the instructions received from ATC and then responding to the resolution advisory issued by the TCAS.

Once the conflict was clear, aircraft TCX 14RL was cleared to climb to FL 240 and transferred to the Barcelona ACC at that level.

2.3. Personnel actions

The communications between the two aircraft and sector DEO of the Palma ACC show how the crew of aircraft XGO 5LD first contacted said station, after which they received successive and unsolicited clearances to climb to FL 100 and FL 120, to fly direct to GALAT, to climb to FL 280 and finally to contact the Barcelona ACC, all of which the crew acknowledged.

As for the crew of TCX 14RL, they established contact with this station, after which they received successive and unsolicited clearances to climb to FL 100 and FL 140, which they acknowledged. Immediately after the second acknowledgment, they requested and were cleared to fly direct to GALAT. When the crew reported they were nearing FL 140, they requested to continue climbing and were re-cleared to FL 280. They were finally instructed to contact the Barcelona ACC.

These communications underscore the criterion, generally admitted by both aircraft crews and controllers, that aircraft must reach the maximum allowed levels as quickly as possible, which is why crews are constantly asking for new climbing clearances and controllers are also constantly giving them, with the ensuing increase in the workload for controllers.

In this context, having ATC stations clear aircraft to the highest allowed level could create problems later when coordinating with adjacent sectors, who would have to deal with aircraft that are horizontally separated but at the same level.

If, in addition, as happened in this case, the performance of the tailing aircraft exceeds that of the one preceding it, this raises the probability that the separation between them will be excessively reduced without this situation being detected before an evasive maneuver has to be ordered and/or carried out.

2.4. Sector DEO at the Palma ACC

In the opinion of the planning controller who was at the DEO post, adding the OXX sector to the DEP sector required the controller to pay additional attention to separate and remote geographical areas, to the takeoff sequence and to aircraft at high levels. The tactical controller, who was also at this post, regards this configuration as problematic as it requires focusing on distant points with a high potential for conflict situations.

As for the incident itself, the tactical controller thought that the momentary lack of attention was basically due to the grouping of sectors, with the large number of aircraft

and the communications that were taking place, which required handling aircraft in various points that were far apart geographically.

In this regard, based on the most likely traffic characteristics in sector DEO and considering the procedures in place for managing it, the volume of this sector is regarded as adequate. Managing it within its capacity limits should not pose problems.

As stated in the last paragraph of Section 1.5, between 10:03:18 and 10:15:48, sector DEO of the Palma ACC had 12 different aircraft under its control; in other words, the controller at that post handled 12 aircraft in a period of 12:30 minutes.

The number of aircraft in sector DEO of the Palma ACC at the time of the incident is not regarded as excessive. There could, however, have been a large amount of radio traffic for the reasons described in 2.3.

2.5. Conflict detection

As noted in 1.8.2, the SACTA system has a Short-Term Conflict Alert (STCA) function that is designed to aid controllers in preventing collisions between aircraft by issuing alerts when it detects a potential or actual violation of separation minimums.

This feature can be turned on or off at a specific console or for specific volumes of airspace. In the case of the airspace under the responsibility of the Palma ACC, it is not enabled as it produces a large number of nuisance conflict alerts that considerably increase the workload of ATC personnel.

A properly adjusted and validated STCA function on the SACTA system can provide an excellent technological safety barrier to prevent collisions between aircraft, comparable to the TCAS outfitted on aircraft.

As a result, two safety recommendations are issued in this regard.

3. CONCLUSIONS

3.1. Findings

a) The crews of both aircraft had their licenses, ratings and medical examinations valid and in force.
b) The two aircraft had been maintained in accordance with their approved maintenance programs, and had valid and in force Registration and Airworthiness Certificates.
c) The two aircraft took off from the same runway, followed the same standard instrument departure and were authorized at the same flight level, and were in radar and radio contact with the same control sector.
d) The navigation aids that support the GALAT 2R instrumental departure, which was followed by both aircraft, were operational on the day the incident occurred.
e) The ground-air communications operated properly at all times.
f) The aircraft TXC 14RL, faster, gradually reduced its separation with XGO 5LD, which preceded it, until reaching a minimum horizontal separation of 0.5 NM and a minimum vertical separation of 1,000 ft.
g) The minimum separation was reached with the aircraft TXC 14RL performing an evasive maneuver, following initially the instructions given by control and responding later to a resolution advisory (RA) issued by the TCAS.
h) In the airspace under the responsibility of the Palma ACC, the Short-Term Conflict Alert (STCA) function is not enabled as it produces a large number of nuisance conflict alerts that considerably increase the workload of ATC personnel.

3.2. Causes

The incident occurred when the DEO sector of the Palma ACC cleared aircraft TCX 14RL to climb to the same flight level as that previously authorized for aircraft XGO 5LD, which preceded it.

The performance of aircraft TCX 14RL exceeded that of XGO 5LD, which caused the separation between the two aircraft to be excessively reduced. The late detection of this situation resulted in ATC ordering the former to carry out an evasive maneuver and a resolution advisory being issued on its TCAS.

4. SAFETY RECOMMENDATIONS

The investigation has revealed that the SACTA system has a Short-Term Conflict Alert (STCA) feature that is designed to aid controllers in preventing collisions between aircraft by issuing alerts when it detects a potential or actual violation of separation minimums. This feature can be turned on or off at a specific console or for specific volumes of airspace. In the case of the airspace under the responsibility of the Palma ACC, it is not enabled as it produces a large number of nuisance conflict alerts that considerably increase the workload of ATC personnel.

Since a properly adjusted and validated STCA function on the SACTA system can provide an excellent technological safety barrier to prevent collisions between aircraft, comparable to the TCAS outfitted on aircraft, the following Safety Recommendations are issued:

REC 61/2014. It is recommended that ENAIRE, the air navigation service provider in Spain, study the reasons why the Short-Term Conflict Alert function of the SACTA system is not enabled in the airspace controlled by the Palma ACC.

REC 62/2014. It is recommended that ENAIRE, the air navigation service provider in Spain, if the Short-Term Conflict Alert function of the SACTA system is enabled in the airspace controlled by the Palma ACC, ensure that the necessary measures are taken for its proper adjustment and validation such that the possibility of nuisance conflict alerts is minimized.