



## 1. FACTUAL INFORMATION

### 1.1. History of the flight

On 2 January 2012, a Cirrus SR22 aircraft, registration N217ET, was on a private flight with one person onboard between the Mallorca Son Bonet Airport (LESB) in Spain and the Toussus-le-Noble Airport (LFPN) in France. A Beechcraft 90 King Air, registration PH-KBB, was on an instructional flight with two persons onboard, having taken off from the Rotterdam Airport in the Netherlands (EHRD), with destination to the Girona Airport (LEGE) in Spain.

Aircraft N217ET was in radio and radar contact with the Barcelona ACC Sector T1 and was proceeding to point KANIG at FL110. Aircraft PH-KBB had been transferred by the Marseille ACC to the Barcelona ACC Sector T1 and was proceeding directly to point KANIG descending to FL120. The aircraft were on convergent and opposite headings.

At 11:25:01 h the two aircraft crossed each other at FL110, separated by a vertical distance of 200 ft and a horizontal distance of 0.2 NM. Aircraft PH-KBB had descended from the flight level authorized by ATC (FL120) because, according to its crew, it had been cleared by ATC to FL90.

The aircraft were 2 NM north of reporting point KANIG, formally in French air space but under Spanish air traffic control (Barcelona ACC Sector T1).

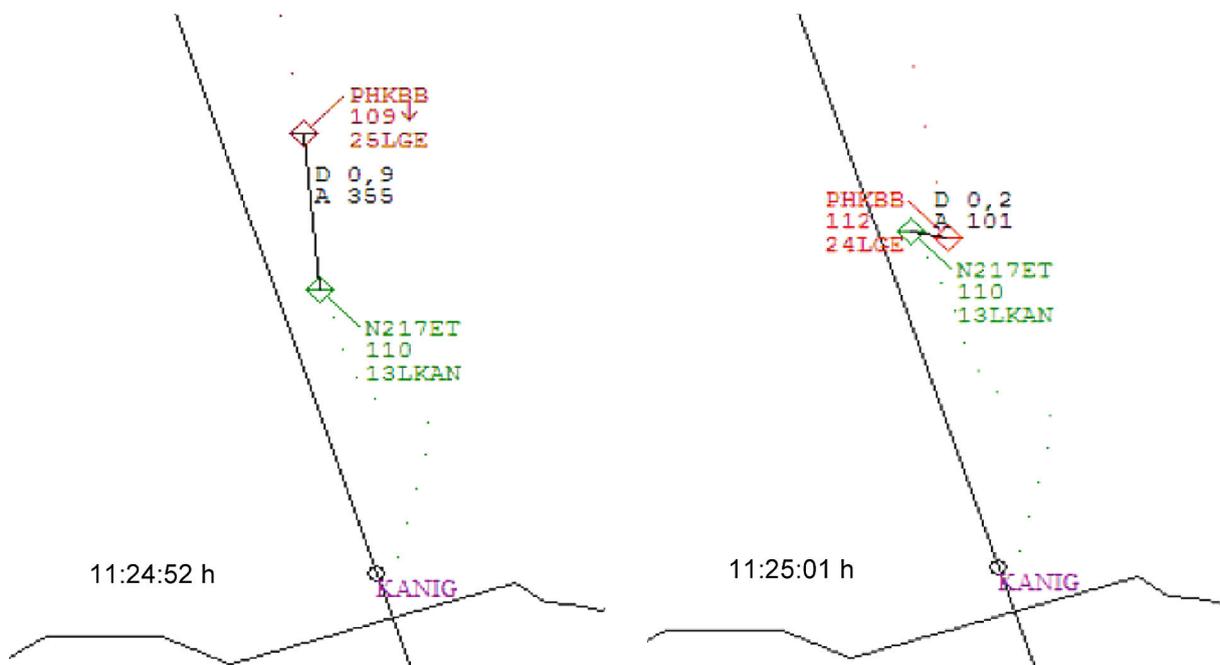


Figure 1. Crossing of aircraft PH-KBB and N217ET

## 1.2. Personnel information

### 1.2.1. *Information on crew of aircraft N217ET*

The captain of aircraft N217ET, a 39-year old French national, had a private airplane pilot license and a class 2 medical certificate, both valid and in force at the time of the incident. He had a total flight experience of 404 h, of which 144 had been on the type. It was not his first time flying this route.

### 1.2.2. *Information on crew of aircraft PH-KBB*

Onboard aircraft PH-KBB were two pilots on an instruction flight. The pilot seated in the LH seat was conducting a line check. The captain was seated in the RH seat.

The pilot flying at the time of the incident was in the LH seat. He was 59 years old. He had a commercial airplane pilot license and a medical certificate, both valid and in force at the time of the incident. He had a total of 14,500 flight hours, 2,000 on the type.

The copilot, occupying the RH seat at the time of the incident, was 54. He had a commercial airplane pilot license and a medical certificate, both valid at the time of the incident. He had a total of 4,423 flight hours, 2,370 on the type.

### 1.2.3. *Information on ATC personnel*

The executive controller for sector T1 had a valid and in force license and medical certificate. He had had an Approach Control rating for the Barcelona control center since 21 April 1993.

The planning controller for sector T1 had a valid and in force license and medical certificate. He had had an Approach Control rating for the Barcelona control center since 10 January 2003, and a Route Control rating for the same center since 30 October 1998.

## 1.3. Aircraft information

Aircraft PH-KBB, a Beechcraft C90 King Air type BE9L, was equipped with a Honeywell KTA870/KMH880 traffic advisory system (TAS).

Aircraft N217ET, a Cirrus SR22 G1000, was equipped with a Garmin TAS610 traffic advisory system.

### 1.3.1. *Traffic Advisory System (TAS)*

Both aircraft were equipped with a traffic advisory system. The TAS is an onboard collision avoidance system. It works independently of the navigation and navaid systems used for air traffic services. Through its antenna it interrogates the transponders of nearby aircraft and, based on the information received, shows the relative position, altitude (when included in the reply message) and heading of nearby aircraft. In addition, it uses the replies received to calculate the time to the closest point of approach with other aircraft. Depending on the value of this parameter, the system may issue visual and aural alerts.

The TAS on PH-KBB and N217ET provided traffic advisories (TA) to inform the pilot of the presence of aircraft that posed a possible collision threat. They did not give resolution advisories (RA), that is, evasive maneuvers to avoid closing in on and colliding with another aircraft, as such advisories are not required on these aircraft<sup>2</sup>.

In the case of PH-KBB, the TA were displayed with the conflicting aircraft shown as a yellow circle and an aural warning "TRAFFIC TRAFFIC". On N217ET, the visual display was the same and the aural warning was "TRAFFIC".

Once a TA is received, the principle of "see and avoid"<sup>3</sup> and ATC procedures continue to be the primary means for ensuring aircraft separation. The pilot must not initiate an evasive maneuver based solely on TAS information.

## 1.4. Aids to navigation

The aircraft did not have any type of flight data or cockpit voice recorder, as these were not required. All of the information on the incident comes from the communications and radar trajectories recorded by the ATC stations involved, in this case the Barcelona ACC Sector T1.

The radar data showed that aircraft N217ET was established at FL110 before the incident, after having requested to climb from FL100. Aircraft PH-KBB had been descending steadily at an approximate rate of 1,300 fpm (feet per minute) since 11:15 h, ten minutes before the incident. The descent was halted after the call from ATC to return to FL120, the level to which it had been cleared (see Section 1.5).

<sup>2</sup> Pursuant to OPS 1.688, Onboard anti-collision systems, to the Annex of Commission Regulation (EC) no. 859/2008 of 20 August 2008 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane, aircraft with a certified maximum takeoff weight in excess of 5,700 kg or a maximum approved configuration of more than 19 passenger seats must be equipped with anti-collision systems that issue not only traffic advisories (TA) but also resolution advisories (RA).

<sup>3</sup> The "see and avoid" principle consists of having the crew visually acquire the conflicting aircraft before starting an evasive maneuver. This procedure is limited when aircraft are flying in instrument meteorological conditions, where visually acquiring the conflicting aircraft is made more difficult by the reduced visibility.

The cleared flight level field that is shown on the radar screen next to the aircraft's real altitude, and which is manually entered by the controller, indicated FL110 for N217ET and FL120 for PH-KBB.

The descent by aircraft PH-KBB beyond its cleared flight level of FL120 lasted from 11:24:16 h (when it reached FL120) until 11:24:52 h (when it reached the minimum altitude of 10,900 ft), or 36 seconds. The aircraft descended below FL120 without stopping, continuing with the descent rate it had been keeping for the last 10 minutes. It then returned to FL120 after being instructed to do so by ATC.

The vertical and horizontal distances between the aircraft during the incident are shown in Table 1.

UTC time	Flight level N217ET	Flight level PH-KBB	Vertical separation (ft)	Horizontal separation (NM)
11:24:12	108	122	1,400	5.1
11:24:16	108	120	1,200	4.6
11:24:21	108	118	1,000	4.1
11:24:26	109	117	800	3.5
11:24:32	110	115	500	3.0
11:24:36	110	113	300	2.5
11:24:41	110	111	100	2
11:24:46	110	110	0	1.5
<b>11:24:52</b>	<b>110</b>	<b>109</b>	<b>100</b>	<b>0.9</b>
<b>11:24:56</b>	<b>110</b>	<b>110</b>	<b>0</b>	<b>0.4</b>
<b>11:25:01</b>	<b>110</b>	<b>112</b>	<b>200</b>	<b>0.2</b>
11:25:06	110	115	500	0.6
11:25:12	110	119	900	1

Table 1. Vertical and horizontal separations during the incident

## 1.5. Communications

Communications with the two aircraft were in English. The level of English of both crews was very good and the exchanges were fluent. In the case of aircraft N217ET, all of the communications were performed correctly with full acknowledgments of ATC instructions and with the callsign included in every exchange. As for aircraft PH-KBB, 12 of its exchanges with sector T1 were available, some of which are transcribed below. The full acknowledgment of ATC's instructions and the use of the callsign were not

constant in its communications. The controller spoke in English with the two crews. His English was fluent. He held the communications with the remaining aircraft under his control in English or Spanish, depending on the nationality of the operator.

At 11:18:52 h, aircraft PH-KBB contacted sector T1 for the first and only time until the incident. It was descending to FL120, cleared to do so by French ATC.

11:18:52 PHKBB *Eh... papa hotel kilo bravo bravo in descent flight level one two zero to KANIG, and we copied the weather (unintelligible) for Girona, and (unintelligible) runway two zero ILS.*

11:19:03 Sector T1 *Papa hotel kilo bravo bravo buenos días maintain level one two zero and fly the KANIG2K arrival, ru... runway zero two.*

11:19:12 PH-KBB *KANIG2K arrival with for the runway zero two.*

At 11:24:16, aircraft PH-KBB reached FL120 and continued descending (Table 1). ATC identified this descent and began a series of exchanges at 11:24:33 instructing its crew to climb to FL120:

11:24:33 Sector T1 *Papa bravo bravo Barcelona.*

11:24:35 Sector T1 *Papa bravo bravo Barcelona.*

11:24:37 PH-KBB *Go ahead.*

11:24:39 Sector T1 *Maintain one two zero please maintain one two zero traffic opposite direction twelve of your position level one one zero.*

11:24:45 PH-KBB *One one zero (unintelligible).*

11:24:47 Sector T1 *Papa bravo bravo maintain...climb one two zero immediately.*

11:24:51 PH-KBB *... zero imme...*

After this transmission, the aircraft climbed and maintained FL120. The controller was relieved from his post after the incident.

Three minutes before the incident, ATC had cleared a Vueling aircraft with callsign VLG80AB to descend to FL90.

11:21:15 Sector T1 *Vueling ocho cero alfa bravo descenso nueve cero<sup>4</sup>.*

11:21:21 Sector T1 *Vueling eight zero alfa bravo descend level nine zero.*

11:21:24 VLG80AB *...scenso a nueve cero vueling ocho cero alfa bravo<sup>5</sup>.  
(simultaneous communications)*

After the controller's instruction three exchanges took place, with VLG80AB acknowledging the instruction, although the transmission quality was not good and it was not as clear as the other exchanges. Then, another aircraft initiated a transmission

<sup>4</sup> English: "vueling eight zero alfa bravo descend level nine zero".

<sup>5</sup> English: "descend nine zero vueling eight zero alfa bravo".

with ATC and at the same time the controller contacted a collateral sector and replied to the last aircraft.

At 11:19:22 and 11:19:29, while communicating with other aircraft, the controller detected a frequency blockage and reported it on the frequency.

## 1.6. Tests and research

### 1.6.1. *Statement from the crew of aircraft N217ET*

The pilot of aircraft N217ET stated that when the incident took place, he was at FL110 on a heading of 343° toward the PPG VOR/DME, some 3 NM northwest of KANIG on airway A27.

At approximately 11:20, the TAS screen showed an aircraft ahead of him, 500 ft higher and descending. The traffic quickly appeared on the screen in yellow and an advisory was issued. The traffic then steadied on the same flight level just ahead of them. The pilot stated that he could not establish visual contact with the traffic since they were in instrument meteorological conditions (IMC). He then heard the controller instruct an aircraft to climb rapidly to FL120. Shortly afterward, the TAS display showed the traffic climbing just behind the aircraft. The pilot tried to inform the controller of the TA advisory, but the frequency was in use by ATC. When he was able to make contact, he informed the controller that he had received a TA. The controller then transferred him to the Perpignan APP frequency, which confirmed that there had been an aircraft in the opposite direction and that their radar had issued an alarm.

### 1.6.2. *Statement from the crew of aircraft PH-KBB*

The crew of aircraft PH-KBB stated that on the day of the event they were on an instructional flight with two pilots onboard in instrument meteorological conditions.

When they contacted the Barcelona ACC they were cleared to descend to FL90 and proceed directly to KANIG, as acknowledged by the pilot not flying and without the controller saying anything in reply. When they were descending through FL98, the TAS issued a traffic advisory ("TRAFFIC"). The pilot not flying saw traffic at a higher level on the TAS display, flying in the opposite direction and proceeding toward them. At the same time the controller instructed them twice to climb immediately to FL120. They complied with this instruction quickly. They tried to inform ATC that they were complying with the instruction, but the frequency was blocked by the controller's constant communications.

They received a second traffic advisory from the TAS and the pilot not flying saw the traffic at FL120 within 1 NM at the same flight level.

### 1.6.3. *Measures taken by AENA after the incident*

After the incident, AENA determined that the phraseology utilized by the controller to provide traffic information to aircraft PH-KBB about an aircraft on a possible collision course increased the risk associated with the incident. By providing information about the flight level of the other traffic, the crew interpreted that as a new clearance for them. Although it was corrected by the controller, a new call had to be made to the aircraft to clarify what its required flight level was. The phraseology used by the controller was in keeping with the RCA (Spain's Air Traffic Regulations), 4.10.4.1.8, "Information on traffic and evasive measures".

AENA issued a letter on 17 May 2012 to Spain's National Aviation Safety Agency (AESA) requesting a change to the phraseology to be used by air traffic services, deleting the reference to the flight level in these cases.

### 1.6.4. *Analysis of the communications at time 11:21:24*

The communications that took place around 11:21:24 h were processed in an effort to identify PH-KBB's mistaken acknowledgment of the instruction given to VLG80AB. Of the three communications following the controller's instruction, the most confusing in terms of the clarity of the transmission was during VLG's reply, which was obscured by background noise and was not as clean as other exchanges.

This communication was compared with examples of "stepped-on transmissions"<sup>6</sup>, but the type of distortion heard in this case is different. In this incident, the words by the VLG are identifiable and the transmission is not cut off or as confusing as the examples used in the comparison. There was no mention of PH-KBB's callsign nor could a pilot's voice similar to that aircraft's be identified in the transmission.

After this communication, the two simultaneous conversations were clearly identified, one from an aircraft on the sector frequency, and another from the controller with a collateral sector on a different frequency. Despite the simultaneous nature of the conversations, the controller answered the aircraft's call correctly.

## 1.7. **Organizational and management information**

### 1.7.1. *Conflict Alert Function in AENA's SACTA<sup>7</sup> System*

The SACTA system features a Short-Term Conflict Alert (STCA) that is designed to assist controllers in preventing aircraft collisions by issuing alerts when there is a potential or

<sup>6</sup> A "stepped on transmission" is a colloquial term used to indicate that two aircraft are trying to use a frequency simultaneously.

<sup>7</sup> SACTA: Automated Air Traffic Control System.

actual violation of the minimum separation. This function can be turned on and off at a specific console or for specific air volumes.

In the case of the Barcelona Terminal Control Area, which is included in sector T1, the STCA function is disabled so as to avoid the large number of nuisance conflict alerts that would be generated due to the nature of the operations handled by TMAs (departures, arrivals, holding patterns, and so on that involve changing flight paths over short periods of time). In other terminal control areas, such as Madrid's, this function is enabled.

### 1.7.2. *Memorandum of understanding between the Barcelona Control Center (LECB ACC) and the Marseille Control Center (LFMM ACC)*

Annex D of the memorandum of understanding, *Coordination Procedures*, assumes that flights will maintain the flight level coordinated at the control transfer point unless descending or climbing conditions are clearly coordinated verbally or via a data message.

Aircraft arriving at the Gerona Airport (LEGE) from airway A27 (between the PPG VOR/DME and point KANIG) have to cross KANIG at a maximum level of FL190 and descending to FL120, and unless other arrangements are specifically made with Perpignan APP, the Barcelona ACC must guide these aircraft to FL120 until they are past KANIG. Any flight below FL120 is considered to belong to the Perpignan ACC.

When transferring flights toward the LFMM ACC via KANIG, it states that the transfer between Barcelona and the Perpignan ACC will take place if FL120 is not reached.

Annex F, *Radar-Based Coordination Procedures*, indicates that the transfer of radar control can only take place after said transfer has been coordinated while the aircraft is no closer than 10 NM away.

## 1.8. Additional information

### 1.8.1. *European Action Plan for Air Ground Communications Safety*

The goal of Eurocontrol's "European Action Plan for Air Ground Communications Safety" is the safety of air-ground communications. It recommends that in order to prevent blocked transmissions, air operators equip aircraft with anti-blocking devices.

Another of the recommended practices is that ATC personnel who suspect that communications have overlapped ensure that both aircraft have transmitted their

message and that care is taken to confirm that the clearance was not accepted by the wrong aircraft. It also recommends that crewmembers who have a question regarding an ATC instruction do not use an acknowledgment as confirmation, but that they confirm with ATC whether the clearance is correct or not.

### 1.8.2. *Phraseology: acknowledging instructions and messages and using callsigns*

With regard to the use of the callsign in ATC communications and acknowledging instructions, the RCA specifies the following:

- 4.10.2.5. ATC route clearances must be read back in full by the pilot unless the appropriate ATS authority approves otherwise, in which case the receipt must be positively acknowledged.
- 4.10.2.7. Other clearances or instructions, including conditional clearances, must be read back in full or their receipt acknowledged to clearly indicate that they are understood and will be complied with.
- 10.5.2.1.6.3.3.2. Once communications are established, they may be maintained continuously in both directions without a new identification or call until contact is terminated.
- 10.5.2.1.6.3.3.3. So as to avoid confusion whenever possible, controllers and pilots must always include the callsign of the aircraft receiving a clearance whenever giving ATC clearances and acknowledging them.
- 10.5.2.1.8.2.1. When an aircraft station acknowledges receipt of a message, it must include the aircraft's callsign.
- 10.5.2.1.8.2.2. All aircraft stations must acknowledge receipt of important messages from air traffic control or sent on its behalf by reading them back and ending the read back with their callsign.

## 2. ANALYSIS

On 2 January 2012 there was a near miss between two aircraft 2 NM north of reporting point KANIG, on the Spanish-French border. Despite occurring in airspace physically under French responsibility, the aircraft were under Spanish air traffic control, specifically, Sector T1. This situation was allowed by the memorandum of understanding between the Barcelona and Marseille ACCs.

ATC had cleared aircraft PH-KBB, as the incoming traffic, to FL120, and aircraft N217ET, as the outgoing traffic, to FL110. Both aircraft were going to pass over reporting point KANIG separated by 1,000 ft vertically. Both aircraft were handled in accordance with Spain's Air Traffic Regulations and with the memorandum of understanding between the Barcelona and Marseille ACCs.

## Descent flight path taken by aircraft PH-KBB

Aircraft PH-KBB was cleared, first by French ATC and then by Sector T1, to descend to FL120. It was never cleared to descend to FL90. In addition to the communications, the radar records show that the value entered by the controller in the cleared flight level field for aircraft PH-KBB was always FL120. The radar data, however, showed that the aircraft was on a constant descent that gave no indication of stopping at FL120. In other words, the aircraft's flight path confirmed the crew's statement insofar as they were convinced that they were cleared to FL90.

## Clearance for VLG80AB to FL90

The ATC communications could not be used to establish at what moment the crew of aircraft PH-KBB believed it had been cleared to FL90, since the only instruction they received from Sector T1 was to maintain FL120<sup>8</sup>. This instruction was not fully read back by the crew, which omitted exactly the flight level. The use of the term "maintain" reinforces the fact that the flight level was not being changed. Thus, there was nothing in the initial communication at 11:19:03 h that could have given rise to any confusion regarding the crew's final altitude. The English was fluent and the transmission was clear, ruling out any misunderstandings caused by the language or the quality of the transmission.

Since there were no subsequent transmissions for the aircraft from ATC, the only possibility that remains is that the crew interpreted another aircraft's instruction as its own. Five minutes elapsed between the first clearance and the time when the aircraft reached FL120. Of all the communications held in that time, the only clearance with a similar callsign involved VLG80AB (Vueling eight zero alfa bravo) three minutes before the incident. At that time aircraft PH-KBB was at FL170, meaning if its crew interpreted the clearance as being for them, it would explain the constant descent of the aircraft without stopping at FL120.

Regarding this instruction to Vueling aircraft, it should be point out that:

- the instruction was clear and concise,
- use of both English and Spanish language in the ATC instruction, and the acknowledge in Spanish language, and
- despite of the fact that the acknowledge of the instruction was understood clearly, the communication had bad quality.

This was the only instruction whose acknowledgment was problematic due to its lack of quality. It could have been detected the PH-KBB error if the air traffic controller had

<sup>8</sup> "Maintain level one two zero".

corrected or clarify the last bad quality communication. But, from the point of view of the controller, the instruction had been acknowledged by the correct aircraft, so there was no need to repeat it.

Use of both English and Spanish language could lead to the PH-KBB crew to understand that the English instruction was for them, taking into account that the last word of the indicative was the same and that the acknowledge by the Vueling was done in Spanish.

While the acknowledgment of VLG80AB is understood clearly, there is a background noise that could not be identified. During this transmission neither the callsign nor the voices of the PH-KBB crews are heard at any time. The noise patterns also do not match those encountered in other cases of "stepped-on transmissions". As a result, while it seems that in that transmission aircraft PH-KBB did not acknowledge its instruction, this could not be completely ruled out. The controller, who had considerable experience, was familiar with the noises typical in these situations. In fact, he identified them on other occasions, so had he detected any indications of it, it stands to reason that he would have initiated a new transmission. A safety recommendation is issued to assess the possibility of having ATC stations use systems for detecting simultaneous transmissions in the same frequency and warn the air traffic controller.

Immediately afterwards, the controller initiated a simultaneous transmission with another sector while at the same time placing a call to a third aircraft. The short time it took him to initiate that transmission indicates that the controller's attention, once the instruction was given, was devoted to the information he was going to give to the collateral sector and was thus divided.

### **Phraseology and statement from crew of PH-KBB**

During the 12 exchanges between aircraft PH-KBB and Sector T1, the callsign was omitted on eight occasions, ATC's messages and instructions were not read back in their entirety and in the first communication the cleared flight level was omitted. The Air Traffic Regulations permit these omissions except for two, in which the callsign should have been included and the cleared flight level should have been acknowledged. A safety recommendation is issued to improve crew training and awareness regarding the use of the callsign on all ATC communications and the complete read back of all ATC instructions.

The crew, both in its actions and in its statement, emphasized that they were cleared to KANIG and FL90. This information does not match the actual communications during the incident. ATC's instructions, both in the initial transmission with the aircraft and in the communication with VLG80AB, were very clear and concise. There was no possibility of confusing the callsign and the transmissions were free from noise. There were no

interruptions on the frequency or any other circumstance that could have given rise to confusion. The crew's level of English was good.

### Conflict management

The conflict was immediately detected by ATC. At 11:15:21 h, the first radar return appeared showing the aircraft below FL120. Within 12 seconds, the controller initiated a series of calls to have it climb to FL120. Since the aircraft had been descending, the loss of altitude is regarded as normal and within the maneuvering margins needed for the aircraft to stop the descent and start to climb. The crew of aircraft PH-KBB, therefore, did not delay its reaction and executed ATC's instructions immediately.

In this case, the time to detect the conflict had no bearing on the incident due to the controller's instantaneous reaction. This detection may not have been so fast, however, if the controller's workload or attention had been focused on other aircraft. In these cases, the STCA function that is enabled in other terminal areas would have been particularly useful due to its ability to predict conflicts. To make matters worse, the anti-collision systems on the two aircraft did not issue evasive maneuvers. Also, the instrument meteorological conditions prevented both crews from seeing the conflicting aircraft. As a result, the only alternative left, given the impossibility of applying the principle of "see and avoid", is to rely on ATC's instructions. A safety recommendation is thus issued to AENA to assess the possibility of enabling the SACTA alert function that is in use at other stations.

The aspect of the standard phraseology used by ATC to handle the conflict has already been analyzed and addressed by AENA (see Section 1.6.3), which has requested the omission of flight level in these situations. Still, a safety recommendation is issued to the DGAC as a follow-up to AENA's initiative to ensure that this measure is carried out. Aircraft PH-KBB initially understood that it was being required to climb to FL110, the flight level of the conflicting aircraft. The controller once again detected the misunderstanding and corrected the information. This aspect is regarded as relevant due to its ability to aggravate potential conflict situations.

The action of relieving the controller after the incident is regarded as correct due to the stress to which he was subjected during the near miss.

## 3. CONCLUSIONS

### 3.1. Findings

- Aircraft PH-KBB and N217ET were equipped with anti-collision systems that provided traffic advisories (TA) but not resolution advisories (RA).

- Aircraft PH-KBB and N217ET were on opposite and convergent headings.
- The separation required by the RCA was 1000 ft: PH-KBB at FL120 and N217ET at FL110.
- Instrument meteorological conditions (IMC) prevailed during the near miss and neither aircraft had visual contact with the other as they approached.
- Sector T1 cleared aircraft PH-KBB to descend and maintain FL120. The clearance for FL90 was for VLG80AB.
- Clearance to VLG80AB was done in Spanish and English language, and the acknowledge in Spanish.
- Aircraft PH-KBB descended continuously without stopping at FL120, consistent with its crew's belief that they had been cleared to FL90.
- The TAS systems on both aircraft issued two traffic advisories during the encounter.
- Sector T1 immediately detected that aircraft PH-KBB was descending below its cleared flight level.
- The two aircraft crossed each other with a horizontal and vertical separation of 0.2 NM and 200 ft, respectively.
- Aircraft PH-KBB reacted immediately and climbed to FL120 after being instructed to do so by Sector T1.
- Radar records indicate the PH-KBB crew thought they were cleared to FL90.

### 3.2. Causes

The cause of the near miss between aircraft N217ET and PH-KBB, with a vertical separation of 200 ft and 0.2 NM, was the descent of aircraft PH-KBB below the flight level authorized by ATC (FL120). The cause for this descent could not be determined, though it seems likely that a clearance, done using both English and Spanish language, intended for another aircraft that had the same last letter in its callsign was interpreted by the crew of PH-KBB as being for them.

Contributing to the incident was the existence of instrument meteorological conditions, which kept the aircraft from establishing visual contact with each other, and the inability of their TAS systems to issue evasive maneuvers, which kept the aircraft from initiating an evasive maneuver to avoid the conflict.

## 4. SAFETY RECOMMENDATIONS

**REC 84/12.** It is recommended that AENA, as the ATC services provider, evaluate the possibility of implementing devices in its communications systems that detect simultaneous transmissions using the same frequency and warn the air traffic controller.

- REC 85/12.** It is recommended that AENA, as the ATC services provider, evaluate the possibility of enabling the STCA (Short-Term Conflict Alert) function at the Barcelona ACC station.
- REC 102/12.** It is recommended that the DGAC, as the regulatory organization, revise Section 4.10.4.1.8, "Information on traffic and evasive maneuvers" of Spain's Air Traffic Regulations, to delete the explicit reference to the flight level of aircraft on a possible collision course.
- REC 103/12.** It is recommended that AIRKUB B.V., as the operator of aircraft PH-KBB, take the necessary measures so that its crews use the proper phraseology when communicating with ATC and that they read back ATC instructions completely using a standard formula.