

Report A-003/2018

Accident involving an Airbus A319-111, registration G-EZII, on descent into the El Prat Airport (Barcelona, Spain) on 1 January 2018.

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Notice

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) nº 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.

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Abbreviations

AEMET	Spain's National Weather Agency
AOC	Air operator's certificate
ATC	Air traffic control
ATPL(A)	Air transport pilot license (Airplane)
CAA	Civil Aviation Authority
CAS	Calibrated air speed
CIAIAC	Spain's Civil Aviation Accident and Incident Investigation Commission
CPL(A)	Commercial pilot license (airplane)
CVR	Cockpit voice recorder
D	Days
FA	Flight attendant
FC	Flight cycles
FH	Flight hours
FL	Flight level
Ft	Feet
Ft/min	Feet per minute
FDR	Flight data recorder
G	Acceleration due to gravity
H	Hours
IFR	Instrument flight rules
IAS	Indicated Airspeed
IR	Instrument rating
Kg	Kilograms
Kt	Knots
LEBL	Barcelona Airport
LV	Low visibility
METAR	Meteorological aerodrome report
min	Minutes
MTOW	Maximum Take Off Weight
NM	Nautical miles
PBN	Performance-based navigation
QAR	Quick access recorder
sec	Seconds
SIGMET	Significant meteorological information

TAF	Terminal aerodrome forecast
UTC	Coordinated universal time
WAFC	World Area Forecast Center

Synopsis

Operator:	EasyJet
Aircraft:	Airbus A 319-111, registration G-EZII
Date and time of accident:	1 January 2018 at 19:40 UTC ¹
Site of accident:	80 NM northeast of the Barcelona-El Prat Airport (LEBL), Spain
Persons on board:	151, 1 seriously injured
Type of flight:	Commercial air transport – Scheduled – International - Passenger
Flight rules:	IFR
Phase of flight:	En route – Normal descent
Date of approval:	26 de septiembre de 2018

Summary of event:

On Monday, 1 January 2018, an AIRBUS A-319-111 aircraft, registration G-EZII, operated by easyJet, suffered the effects of turbulence as it was descending into the El Prat Airport (Barcelona), approximately 80 NM northeast of the airport and crossing through FL195.

At one point during the turbulence, the airplane was violently shaken, and an FA (flight attendant) who was standing fell to the aisle and was unable to return to her seat until the turbulence subsided.

The aircraft then completed the flight normally.

The FA was seriously injured and the aircraft was not damaged.

The investigation has concluded that the accident occurred because the injured FA stood up from her seat when the seatbelt lights were on due to the turbulence warning, just as the turbulence suddenly worsened.

¹ All times in this report are in UTC unless otherwise specified. On the date of the accident, local time was equal to UTC + 1 hour.

1. FACTUAL INFORMATION

1.1. History of the flight

On Monday, 1 January 2018, an AIRBUS A-319-111, registration G-EZII and operated by easyJet, was on a scheduled flight between the Malpensa Airport in Milan (Italy) and the El Prat Airport in Barcelona (Spain) with 145 passengers, two pilots and four flight attendants on board.

The flight had been uneventful, though it had experienced light and/or moderate turbulence conditions.

As the aircraft was in the descent phase, 80 NM away from the Barcelona Airport and passing through FL195, in light turbulence conditions with the cabin secured, one of the FA who was in the aft galley stood up to pick up a water bottle. At that moment, the aircraft was violently shaken, which caused the FA to fall to the floor and sprain her right wrist. The FA was unable to stand right away due to the persistent effects of the turbulence.

At that moment the captain issued a warning message informing the passengers and crew to remain seated.

Once the turbulence was over, the FA returned to her seat.

According to the FA's statement, and since she only felt minor pain, she decided to resume her flight duties on the return flight from Barcelona to Malpensa.

Once at the destination, at the hospital she was diagnosed with a broken right wrist.

1.2. Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Total in the aircraft</i>	<i>Other</i>
Fatal				
Serious	1		1	
Minor				
None	5	145	150	
TOTAL	6	145	151	

1.3. Damage to aircraft

The aircraft was not damaged.

1.4. Other damage

Not applicable.

1.5. Personnel information

1.5.1. Information on the crew of the aircraft

The pilot, a 52-year-old Italian national, had an airline transport pilot license (airplane) (ATPL(A)) issued by the Civil Aviation Authority (CAA) of the United Kingdom, with A320 type, instrument, PBN (performance-based navigation) and LV (low visibility) ratings, all of them valid until 31 January 2019. He also had the relevant class-1 medical certificate, which was valid until 7 June 2018.

He had a total of 17,000 flight hours, of which 10500 had been on the type.

He had 129:40 duty hours in the previous 90 days, 45:22 h in the previous 30 days and 5:38 h in the previous 48 h.

The first officer, a 31-year-old British national, had a commercial pilot license (airplane) (CPL(A)) issued by the Civil Aviation Authority (CAA) of the United Kingdom, with A320 type, instrument and LV (low visibility) ratings, all of them valid until 28 February 2018. He also had the relevant class-1 medical certificate, which was valid until 2 November 2018.

He had a total of 3,662 flight hours, of which 2966 had been on the type.

He had 48:36 duty hours in the previous 90 days, 40:05 h in the previous 30 days and 9:07 h in the previous 48 h.

The FA involved in the accident, a 34-year-old French national, had a valid flight attendant certificate issued by the Civil Aviation Authority (CAA) of the United Kingdom. She also had the relevant CC-class medical certificate, which was valid until 6 November 2022. She had been working at easyJet since 13 May 2008.

She had 174:02 duty hours in the previous 90 days, 58:04 h in the previous 30 days and 7:18 h in the previous 48 h.

1.6. Aircraft information

1.6.1. General information

The aircraft, an Airbus A319-111 with registration G-EZII and serial number 2471, was manufactured in 2005. It is outfitted with two CFM 56-5B5/P engines and has a maximum takeoff weight (MTOW) of 64000 kg.

It had a Certificate of Airworthiness issued by the Civil Aviation Authority (CAA) of the United Kingdom. Its last airworthiness review certificate was valid until 19 April 2019.

1.6.2. Maintenance information

The last maintenance inspection had been an A01 check² on 16 November 2017, with 37969 flight hours and 26405 cycles on the aircraft. This check had been conducted by Lufthansa Technik and involves tasks to check the evacuation slides, the avionics equipment ventilation, the engine high temperature and fire detection equipment, the hydraulic actuators and mechanical controls for the rudder, the main landing gear doors, structural and other inspections.

1.7. Meteorological information

According to information provided by Spain's National Weather Agency (AEMET), there were few clouds in Catalonia at the time of the accident.

The weather reports for the time in question were as follows:

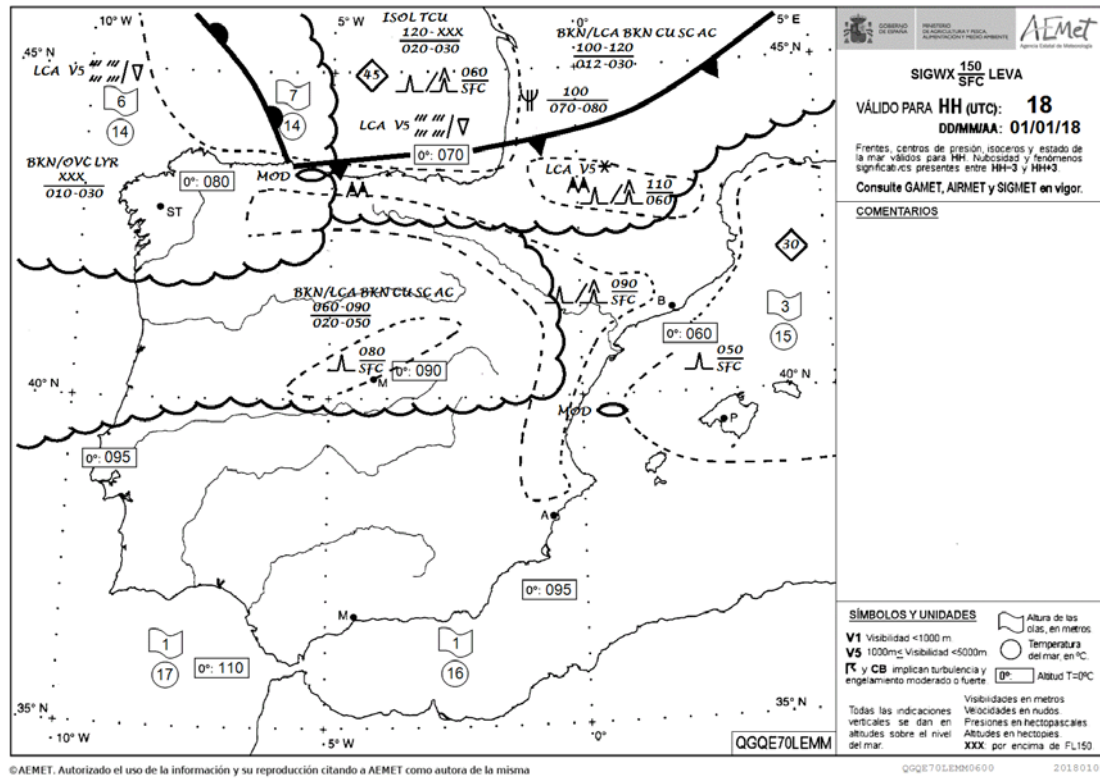
METAR LEBL 011930Z 29020KT 9999 FEW022 15/03 Q1021 NOSIG

METAR LEBL 012000Z 29019KT 9999 FEW022 15/04 Q1021 NOSIG

Winds on the surface were moderate, at about 20 kt from the northwest. Based on AEMET's computer model, the winds aloft were at 20 kt from the west at FL020, at 40 kt from the west at FL050, at 60 kt from the west at FL100 and at 55 kt from the northwest at FL150.

The AEMET low-level significant weather chart indicated that conditions were favorable for moderate turbulence in the area.

² The A checks are done every 750 FH, 121 D or 750 FC (whichever comes first), with the FH generally being the most limiting. The A checks involve four internal checks scheduled sequentially.



According to the model of the WAFC (World Area Forecast Centre) in London, at FL180 the wind was at 75 kt from the northwest.

The significant weather map for the Euro region prepared by the WAFC for levels above FL210 showed that conditions in the area were favorable for moderate, and occasionally strong, turbulence.

1.7.1. Meteorological dispatch information used by the crew

LEBL [BCN] - BARCELONA BARCELONA/EL PRAT

The significant weather chart was the 18:00 UTC medium-high level chart issued by the London WAFC, and showed the aircraft's flight path. This path crossed an area for which the following was forecast:

Area of moderate to occasionally strong turbulence between FL210 and FL350 along the descent route to Barcelona.

The chart shows that the flight crossed through areas with isolated cumulonimbus clouds, mixed with other clouds starting at FL100.



According to information provided by the crew, they received no further details about the turbulence after takeoff, either from ATC or through the automatic SIGMET system. The weather radar also showed no information of interest on the display.

1.8. Aids to navigation

Not applicable.

1.9. Communications

Investigators had access to recordings of the communications between air traffic service stations and traffic in the area, including the accident aircraft.

Before the incident, another aircraft had reported the presence of moderate turbulence along standard terminal arrival route BISBA1Y-25R, first at levels between FL230 and FL200, and subsequently between FL200 and FL110.

The only report that makes reference to “moderate to severe turbulence” was made by the accident aircraft.

After the accident, traffic control services informed the crew of the possibility of encountering moderate turbulence down to FL110.

1.10. Aerodrome information

According to information provided by management at the El Prat Airport, they were not notified of the event, and as a result there is no record of assistance or treatment being given by the airport’s medical services.

1.11. Flight recorders

The information pertaining to the flight data recorder (FDR) was obtained from the quick access recorder (QAR), since by the time the CIAIAC was informed of the accident, the FDR data were no longer available. For this same reason, the information in the cockpit voice recorder (CVR) was also unavailable.

Based on the recorded acceleration data, the flight was rough from the start and for practically its entire duration, although the cruise segment and the start of the descent were relatively calmer.

Subsequently, in the descent phase proper, at 19:39:46 UTC, there was a constant change in both the lateral and vertical accelerations, which peaked for 18 seconds, when the g values ranged between 0.01 g and 1.66 g. During that segment, the CAS varied between 294 kt and 275 kt, and the aircraft descended from 20533 ft to 19905 ft, with the instantaneous vertical speed at one point calculated at 4560 ft/min.

The lateral acceleration also underwent constant changes, ranging in value from -0.17 g to +0.14 g.

Although this was the segment with the strong turbulence, the slight to moderate turbulence conditions persisted practically until the end of the flight.

1.12. Wreckage and impact information

Not applicable.

1.13. Medical and pathological information

Not applicable.

1.14. Fire

There was no fire.

1.15. Survival aspects

Not applicable.

1.16. Tests and research

1.16.1. Interviews and reports

Statements from various individuals involved in the accident were available to investigators.

1.16.1.1. Statement from the flight crew

In their statement, the flight crew noted that the cabin crew had been notified of the possibility of a turbulent flight, which could even delay the departure of the return flight to Milan. They also stated that once en route, they received no information from ATC regarding the presence of turbulence on the descent.

As for the cabin, they stated that it had been secured around 5-10 minutes before they entered the turbulence area, and that apparently one flight attendant who was in the aft galley was picking up a water bottle, since the turbulence had been minor until that point.

Then the turbulence suddenly worsened as they passed through a cloud layer. There was no indication on the radar. The turbulence was such that it made it difficult to stand, and the flight attendant fell and her right arm impacted the floor.

At that point they issued a warning, instructing the cabin crew and passengers to remain seated.

Once the flight in Barcelona ended, she told them *“that it hurt but that she was OK to make the return flight”*.

1.16.1.2. Statement from the FA

“During passing an area of turbulence seat belts signs were on. I stood my up to take one bottle of water to cupboard at rear galley because at the beginning the turbulence was not too strong but suddenly the aircraft shook very violently and I fell in to the floor twisting my right wrist while the cabin crew 3 tried to protect my head. It was so bumpy that I could not come back to my jumpseat. Then pilot made the PA cabin crew and passengers be seated immediately. Once the turbulence passed I came back to my seat. On the ground captain ask me if I were fit to continue my duty coming back to Malpensa. I had a little pain so I decided to continue and I applied some ice on my wrist. During the flight from BCN to MXP I felt my wrist swelling little by little. On arrival I called my boyfriend to pick me up and take me in to the hospital to check my wrist. On the hospital at 1:00 l.t they immobilized my arm and told me to come back next day to do a X rays. Next day I went to hospital and I was diagnosed with a fracture on my right wrist”.

1.16.1.3. Statement from the controller

"The evening of 1 January 2018 was one with a lot of gusty wind affecting the Catalan coast. There was generalized turbulence due to the wind intensity. Moderate turbulence had been reported by some aircraft on standard arrival route BISBA1Y, initially from FL230 to FL200, and then, once I was on the frequency, from FL200 to FL110.

The frequency (121.15-T2W) was also giving problems, since some crews had had to repeat their messages to the previous executive controller, since they were hard to hear.

In the specific case of EYZ34FL (the accident aircraft), which was on STAR BISBA1Y, followed by WZZ1SE at a higher level (some 5000' higher) and within 5 NM, it was cleared to continue the descent (FL100).

WZZ1SE was cleared to descend to levels vacated by EYZ34FL (FL190). During the descent, WZZ1SE was always a little high compared to the standard descent profile and closer to EYZ34FL horizontally, which in turn was below the standard descent profile, I suppose because it was the leading traffic. The entire descent of WZZ1SE was conditioned by the levels being vacated by EYZ34FL, and they were constantly requesting a lower level before being cleared to descend further.

Faced with the oral coordination problems with FINAL, EYZ34FL called me to report, in a very calm voice, that "in order to be able to provide information to later traffic", they had encountered turbulence below level 200. I thought I heard "moderate turbulence", which had also been the type of turbulence reported to me on that route ten minutes earlier, and I hurried to reply to expect moderate turbulence until FL110, which was the information I had at the time.

His tone was merely informative, not alarmed, and he also reported that his IAS was now 250 kt, a situation that hampered the descent of WZZ but that was justified, given the turbulence situation he had just reported to me. We then considered slowing WZZ, but so as not penalize it more, and since he was higher than desired, he was allowed to continue descending. But once in the LESBA area, he caught up to EYZ, their targets overlapping on the radar display, giving an incorrect altitude reading for EYZ.

In the following days, when I was informed of the incident that is the subject of this report, I was stunned to learn that the turbulence encountered by EYZ34FL during its descent had caused injuries. After listening to the tapes, I was able to verify that EYZ34FL had in fact reported "moderate to severe" turbulence, information that at the time I did not hear in its entirety, maybe because of the noise in the room (coordination) or noise on the frequency. In fact, instead of urgently informing WZZ1SE to expect moderate to severe turbulence on its descent, I primarily informed it of the miles out (60 NM) and then informed it to expect "moderate turbulence" on the descent, without mentioning that it could be severe. I think this message would have taken priority, if I had been aware of this fact, of course, given its potential seriousness.

The neutral tone of the pilot of EZY34FL when reporting the turbulence did not make me suspect that the turbulence could have been worse than what had been reported earlier. When I heard “moderate... turbulence”, that was enough for my situational awareness that the moderate turbulence situation persisted. But since I had not told him beforehand to expect turbulence on the descent, that was the time to tell him how far he could expect the annoying turbulence situation to continue (FL110).

When the severe turbulence occurred, it seemed to be crossing BGR. At that point, EZY was some 80 NM out on the BISBA1Y STAR and approximately FL195. Luckily, WZZ1SE was 5000’ higher, and fortunately it was not affected by the severe turbulence.

I am not aware of any other traffic reporting severe turbulence either before or after EZY34FL on any route. That is why until the day when I was requested to write this report, and I listened to the recordings, that I did not know that there had been severe turbulence in the Barcelona airspace on the evening of 1 January 2018.

Now I understand how the unfortunate accident involving the cabin crew occurred, but it would have been impossible for me to warn EZY34FL of the severe turbulence since it was the first and only aircraft to encounter it. Since I did not inform it of the moderate turbulence that had been reported to me ten minutes earlier, and since no one else had gone through there since, I thought it logical that it would inform me of the turbulence and seeing as it continued to affect that route, I rushed to inform it that the turbulence could continue down to FL110. Luckily for WZZ1SE, it could not make a continuous descent due to the presence of EZY34FL, so it passed through that area much higher than the EZY and it was not affected by the severe turbulence. Had I heard the turbulence report in its entirety and not in part, I would have immediately warned WZZ1SE to expect SEVERE turbulence, but that was not the case, though luckily, no one else passed through that particular area at the same altitude at which EZY34FL was affected.

1.17. Organizational and management information

According to section 2.6.8, Turbulence, of the operator’s Cabin Safety Procedures Manual, it states:

2.6.8.2 Pilot notifications to cabin crew

When preparing the flight, the pilots will assess the risk of turbulence and discuss it in the briefing with the cabin crew.

In case of light turbulence, a warning will be given to the passengers; the seatbelts will be verified to be correctly fastened and that the baggage is secure, and then reported to the pilots.

2.6.8.3 Actions to take in case of light turbulence

Warning to passengers.

Verify that the seatbelts are fastened and the baggage secure (if safe to do so), and report “seatbelts fastened” to pilots.

The purser will check with the pilots whether to continue the service.

The captain must inform the purser of the expected flight conditions and their severity, whether the cabin crew must remain seated and the allowed service level, if applicable, the expected duration of the turbulence and any other relevant information in this regard. The purser will relay the instructions to the rest of the cabin crew.

During turbulence, failing instructions from the pilots, the purser may, at his/her discretion, interrupt the actions associated with the service and instruct the crew to check the cabin. Once checked, he/she will report to the captain “seatbelts fastened”.

2.6.8.4 Cabin crew precautions during turbulence

If the pilots believe there might be a risk of turbulence, the cabin will be prepared ten minutes prior to landing.

Once informed by the pilots, the safety of the cabin will be immediately verified and the FAs will sit down with their seatbelts fastened, and quickly report this to the pilots. If some task not affecting safety is pending, it will be addressed later.

The cabin crew may request that the seatbelt sign be turned on if turbulence impedes their duties.

Pursers must instruct their crews to sit if remaining standing is not safe.

More than anything, the cabin crew must look after their own safety and not move about the cabin if it is not safe to do so.

If the severity of the turbulence makes it unsafe for the crew to complete the tasks of securing the cabin (seatbelts fastened and baggage check), a warning must be given to the passengers and pilots.

During periods of prolonged turbulence, notifications must be issued to passengers to ensure they feel safe and sound.

2.6.8.5 Actions in case of severe turbulence:

When severe turbulence conditions are present or expected and there is not enough time to do the normal procedures, the pilots must issue a message to the passengers: *“Crew and passengers sit down immediately”*.

The crew must sit in the closest seat and fasten their seatbelts. If the carts are out, they must be secured in the best way possible given the circumstances. If possible, teapots should be placed on the floor.

Once conditions allow, the pilots will issue the report, "Cabin crew, normal operation".

The cabin crew will then resume normal procedures.

2.6.8.6 Cabin service:

The cabin crew may resume the service only when notified by the pilots that it is safe to do so.

The cabin crew must always ensure their own safety in turbulent atmospheric conditions.

Hot drinks must not be served whenever the seatbelt sign is on.

2. ANALYSIS

2.1 General

The aircraft's pilots had the flight license and medical certificate necessary for the flight.

The aircraft had the documentation needed for the flight.

2.2 Of the meteorological conditions

The crew had the weather information from the METAR and TAF reports for the Barcelona Airport and the significant weather charts for the EURO region prepared by the WAFC.

The data contained in the airport reports indicated they could expect gusty winds, especially when crossing the leeward area of mountains, which can result in turbulence. It is also logical to think that the atmosphere was unsettled, active, with the possible presence of cumulonimbus clouds, which can indicate turbulence at higher altitudes.

One of the most visual sources of information and one of the fastest and general as well, on the situation that can be expected for the route phases is the significant weather charts. These charts "draw" or outline those areas where phenomena are expected that can pose a flight risk, and they describe which phenomena are expected in each area.

One of the problems posed by forecasts in comparison to observations is that they are just that, forecasts. Since a forecast may or may not come true and there are certain areas where, due to their (geographic, topographic or other) features, a forecast may or may not reflect reality, the beliefs about the reliability of forecasts influences how the information they contain is used. The uncertainty in using this type of information is one factor to consider in this type of event. Despite all these potential effects, we must bear in mind that forecasts are an essential part of a flight, since they alert crews to possible risks during the route phase. Forecasts should be used in concert with observations and vigilance during the flight, and not be replaced by them.

The significant weather chart for the Euro region for levels between FL210 and FL350 indicated that the area along the descent route into Barcelona was favorable to moderate and occasionally strong turbulence.

It also showed that the flight path crossed areas with isolated cumulonimbus clouds that were mixed with other clouds from FL100.

According to information provided by the crew, after takeoff they received no further details on turbulence either from ATC or from the automatic SIGMET system.

2.3 Ability to detect turbulence during the flight

Once the aircraft was airborne, the crew had two tools available to them to detect weather phenomena: visual observation and the weather radar.

The weather radar, therefore, is the primary source of information in flight. No reliable details were available from the accident flight regarding the radar mode in use. The only information is the statements from the crew, who stated that they saw no phenomena that would have alerted them to the turbulence.

The use of weather radar has its limits, firstly in terms of the phenomena it is capable of detecting and secondly in terms of its configuration (scope and orientation). The weather radar installed on the aircraft is capable of detecting phenomena, especially those associated with rain. The scope and orientation of the antenna is constantly modified for each phase of flight in order to strike a balance between identifying the details of what is ahead of the airplane and the distance to be scanned so that the crew can react and avoid the phenomena detected. If the orientation is not correct, the crew may not see what is in front of them. Due to the lack of data, it is not known if the radar showed no phenomena due to a faulty setting or because there really was nothing to detect.

2.4 Conduct of the flight

Before the flight, the flight crew had informed the cabin crew of the potential turbulence conditions they could expect during the flight.

The flight was in the descent phase into the airport in light/moderate turbulence conditions.

At the time of the event, the cabin was secure and the “fasten seatbelts” sign was on.

Before the sudden increase in turbulence, one of the FAs stood to perform a task not deemed essential to cabin safety.

When the turbulence worsened, the flight crew issued a warning to the crew and passengers to sit down immediately.

The FA was unable to return immediately to her seat due to the prolonged effects of the turbulence.

Since the FA stated that she only felt slight pain, she continued to perform her duties for the remainder of the flight, and even on the return flight to Milan.

3. CONCLUSIONS

3.1 Findings

The aircraft's pilots had the flight license and medical certificate necessary for the flight.

The aircraft had the documentation needed for the flight.

The crew were aware of the risk of encountering turbulence.

The flight was in the descent phase to the airport in conditions of light/moderate turbulence.

The cabin was secure and the "fasten seatbelts" sign was on.

One of the FAs stood to perform a task not deemed essential to cabin safety.

While she was standing, the aircraft experienced a sudden increase in turbulence and the FA fell to the floor, breaking her right wrist.

3.2 Causes/Contributing factors

The accident occurred because the injured FA stood up from her seat when the seatbelt lights were on due to the turbulence warning, just as the turbulence suddenly worsened.

The excessive confidence of the FA in terms of not expecting sudden changes in the existing flight conditions is deemed to have been a contributing factor.

4. SAFETY RECOMMENDATIONS

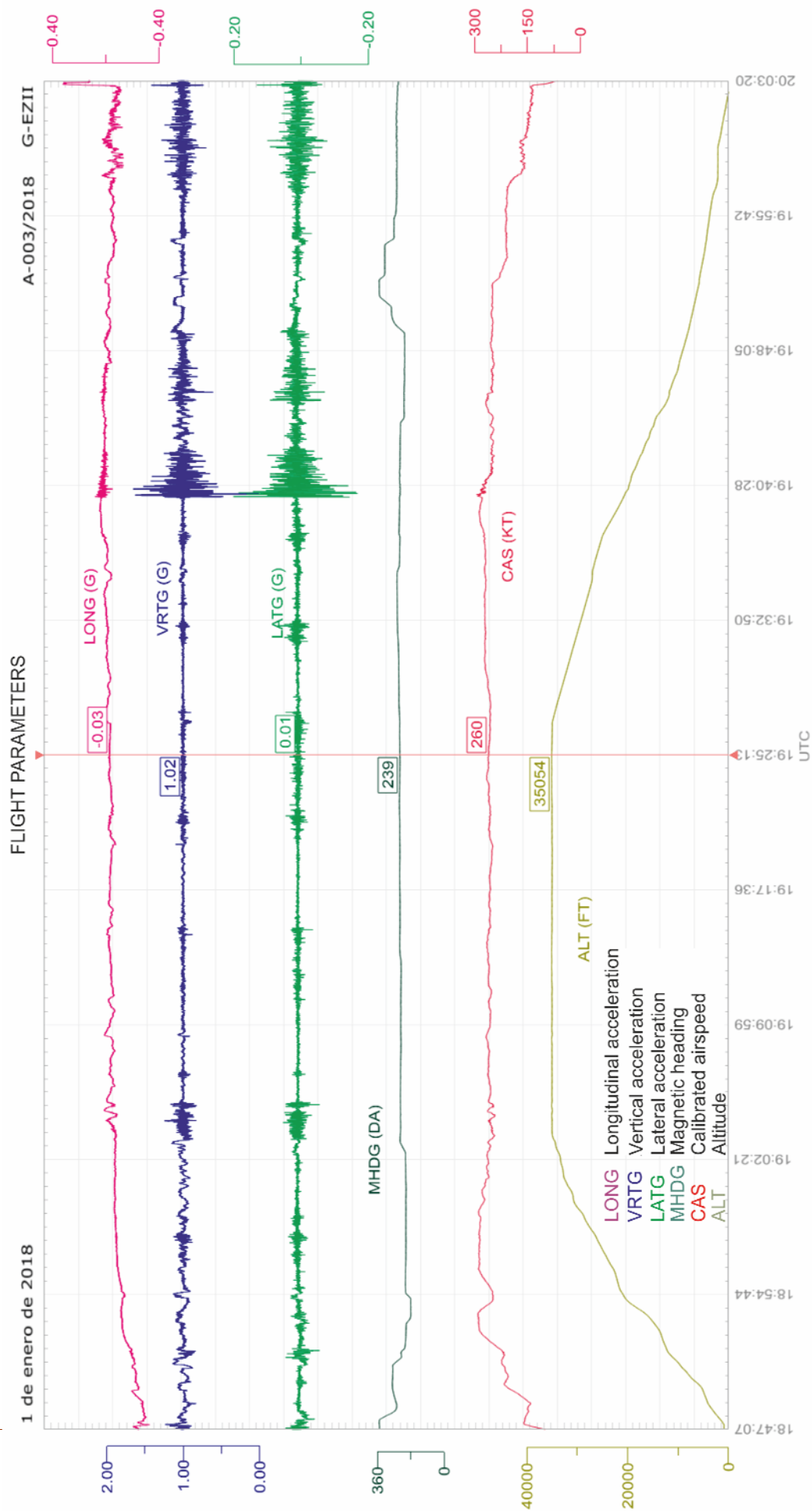
None.

5. APPENDICES

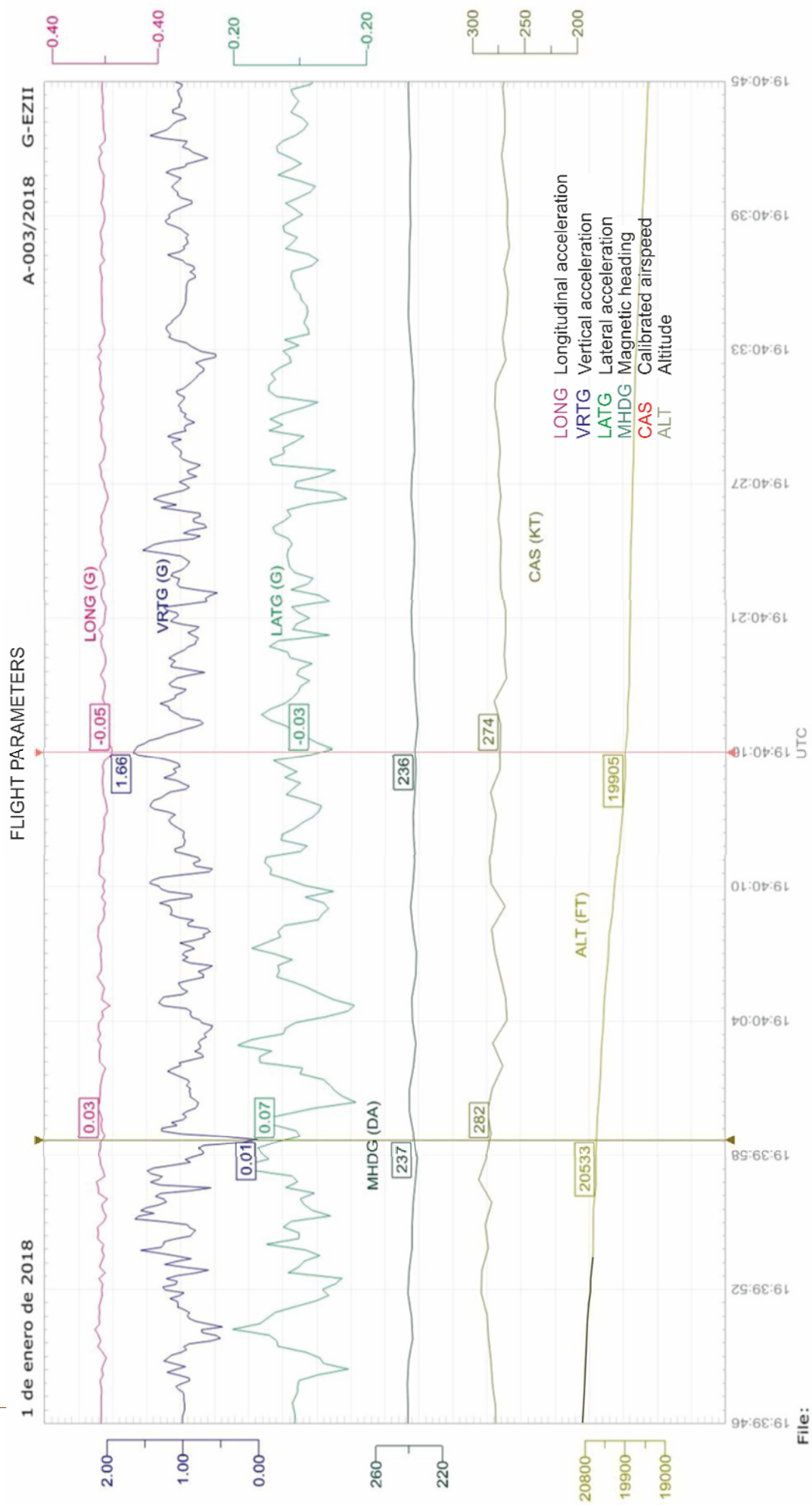
APPENDIX A

**Information from the QAR in the area where the change in vertical acceleration
occurred**

Graph of data from the event



GRAPH OF THE COMPLETE FLIGHT



GRAPH OF THE SEGMENT OF GREATEST INTENSITY

File: