



Air Accident Investigation Unit Ireland

FACTUAL REPORT

INCIDENT

**Boeing 737-8AS, EI-EMA
Descent into Malta-Luqa (LMML)**

15 October 2019



**An Roinn Iompair
Turasóireachta agus Spóirt**
Department of Transport,
Tourism and Sport

FINAL REPORT

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² and Statutory Instrument No. 460 of 2009³, safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

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¹ **Annex 13:** International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.

² **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

³ **Statutory Instrument (SI) No. 460 of 2009:** Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.



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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents on 15 October 2019, appointed Leo Murray as the Investigator-in-Charge, to carry out an Investigation into this Incident and prepare a Report.

Aircraft Type and Registration:	Boeing 737-8AS, EI-EMA	
No. and Type of Engines:	2 x CFMI CFM56-7B26	
Aircraft Serial Number:	35032	
Year of Manufacture:	2010	
Date and Time (UTC)⁴:	15 October 2019 @ 19.30 hrs	
Location:	Descent into Malta-Luqa (LMML)	
Type of Operation:	Public Transport (Scheduled)	
Persons on Board:	Crew - 6	Passengers - 180
Injuries:	Crew - 1 (Serious)	Passengers - Nil
Nature of Damage:	None	
Commander's Licence:	Airline Transport Pilot Licence (ATPL), issued by the Irish Aviation Authority (IAA)	
Commander's Age:	41 years	
Commander's Flying Experience:	13,134 hours, of which approximately 5,000 hours were on type	
Notification Source:	The Operator	
Information Source:	Investigation by correspondence	

⁴ **UTC:** Co-ordinated Universal Time. All timings in this report are quoted in UTC.

FINAL REPORT

SYNOPSIS

The aircraft was on a scheduled passenger flight from Birmingham (EGBB) to Malta (LMML). During descent, the Cabin Services Supervisor (CSS) was advised by the Commander that turbulence may be encountered while deviating around weather. The Commander also switched on the fasten seat belt sign and passengers were seated. Sudden turbulence was encountered while descending through Flight Level (FL)180. Three Cabin Crew Members (CCM) were at the rear of the aircraft at the time, securing the rear galley and toilets. All three fell to the floor and CCM No. 2 sustained serious leg injuries. No other injuries to the passengers or crew on board were reported to the Investigation.

NOTIFICATION

The event was notified by the Operator through the Safety Occurrence and Tracking System (SOTS). The event occurred 60 nautical miles (NM) north-northwest of Luqa, Malta in International airspace but under the control of Malta Air Traffic Control (ATC). As the occurrence took place in International airspace, Ireland, as the State of Registration, carried out the Investigation.

1. FACTUAL INFORMATION

1.1 History of the Flight

³ During descent, the Flight Crew observed (visually) isolated Cumulonimbus (Cb)⁵ clouds which were also identified on the weather radar. The Flight Crew manoeuvred on various headings in coordination with ATC to deviate around the significant weather. On passing Flight Level⁶ (FL)250, the Commander switched on the fasten seat belt sign and advised the CSS that turbulence may be experienced in the descent and the Cabin Crew were instructed to secure the cabin early. The speed was reduced and the aircraft turned right before entering cloud. At that time, the aircraft experienced a significant upset due to turbulence. Three CCM's were at the rear of the aircraft securing the rear galley equipment. All three fell to the floor as a result of the upset and CCM No. 2 sustained serious leg injuries. The CSS was informed of the situation by CCM No. 4, who was then requested to go to the front in order that the CSS could go to the rear galley and assess the situation. The injured crewmember was assisted to the No. 3 (aft) crew seat and made secure for landing. There was no further significant turbulence encountered. Medical assistance was requested for the injured crew member on arrival.

No other injuries were reported by the passengers or crew on board. The injured crew member was brought to a local hospital in Malta for treatment of fractures to both of his lower left leg bones (tibia and fibula). The injured crew member remained in the local hospital for two days.

⁵ **Cumulonimbus (Cb)**: a heavy and dense heap-formed, convective and rain-bearing cloud with considerable vertical extent.

⁶ **Flight Level**: Three-digit representation of aircraft altitude (hundreds of feet) referenced to standard pressure.
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1.2 Injuries to Persons

CCM No. 2 was seriously injured during the turbulence encounter.

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	1	0	0
Minor /None	0	0	

1.3 Flight Data Monitoring (FDM)

The Operator made its FDM data available to the Investigation. This showed the aircraft descending from FL290 to FL140 with a lateral mode HDG SEL (heading select) engaged.

Passing FL200, the lateral navigation mode (LNAV) was engaged with a 15-degree angle-of-bank turn to the left. Passing FL176, HDG SEL was engaged followed by a right turn with a 5-degree angle-of-bank. The speed brake was deployed until passing FL165, and when wings were again level the speed brake was stowed. One second later, the turbulence intensified; a reading of 2.02 g⁷ was recorded and the Static Air Temperature (SAT) decreased rapidly. With the SAT remaining low, accelerations of +/- 1.3 g were evident for 26 seconds. Passing FL157, the SAT increased and the accelerations return to normal values. The autopilot remained engaged throughout the encounter.

2. AAIU Comment

The Commander was aware that turbulent conditions would likely be encountered during the descent, due to Cb activity which was both observed and detected on the weather radar. The passenger seat-belt sign was on and the CSS was also notified of possible turbulence during the descent. The Flight Crew deviated around the most significant weather with reduced bank angle and reduced speed before entering the cloud layer. Rapid changes in SAT are indicative of variability in local atmospheric conditions, and are associated with turbulence. The SAT dropped rapidly as the aircraft entered cloud coincident with turbulence. During the turbulence, vertical acceleration in excess of 2.0 g was recorded momentarily, and three Cabin Crew Members were knocked off balance and fell to the floor. One crew member suffered injury as a result of the fall and occupied the No. 3 (aft) crew seat for the remainder of the flight. The injured crew member was brought to hospital on arrival at the destination.

The Investigation is of the opinion that the Commander took all reasonable steps to mitigate the effects of a likely turbulence encounter. While the Cabin Crew were made aware of the likelihood of turbulence, they were required to secure the cabin. While doing so, a momentary sudden and severe upset occurred. Apart from CCM No. 2, no other crew or passengers were reported injured during the encounter.

- END -

⁷ g: Acceleration as a measure of gravity, in this case acting along the normal (vertical) axis.

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

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