ACCIDENT

Aircraft Type and Registration:	Airbus A330-243, G-MLJL
No & Type of Engines:	2 Rolls-Royce RB211 Trent 772B-60 turbofan engines
Year of Manufacture:	1999 (Serial no: 254)
Date & Time (UTC):	2 August 2019 at 23:54 hrs
Location:	In flight from Varadero Airport, Cuba, to Manchester Airport
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 11 Passengers - 320
Injuries:	Crew - 2 (1 serious) Passengers - None
Nature of Damage:	Radome damaged
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	46 years
Commander's Flying Experience:	12,136 hours (of which 5,300 were on type) Last 90 days - 205 hours Last 28 days - 93 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

While avoiding observed weather radar returns the aircraft encountered unexpected severe turbulence. The encounter lasted for approximately 90 seconds during which two cabin crew members received injuries, one of which was later classified as 'serious'. After consulting with Medlink[1] the aircraft commander elected to continue to destination.

History of the flight

During the climb from Varadeo the flight crew could see that several significant thunder clouds in their vicinity were not painting on the aircraft's weather radar displays. Changing the weather radar selection from System 1 (WRS1) to System 2 (WRS2) appeared to solve the problem.

Approaching SUMRS waypoint (Figure 1) the aircraft was in cloud cruising at FL370 and avoiding weather radar returns. The seat belt signs had been selected 'ON' five minutes earlier as a precaution during light turbulence. The aircraft was 30 nm clear of the closest weather painting on its radar when it entered a denser area of cloud and the turbulence increased. The commander made a PA for the cabin crew to immediately take their seats. Less than

Footnote

[1] In-flight medical advisory service.

5 seconds later the aircraft encountered severe turbulence resulting in a 500 ft altitude gain and autopilot disconnection. The severe turbulence encounter lasted for approximately 90 seconds and was accompanied by the sound of hail striking the aircraft's nose. After the turbulence subsided the autopilot was reconnected and the aircraft returned to its assigned cruising level. Light to moderate turbulence was experienced for the following hour, during which time WRS2 failed. The degraded WRS1 was used for the remainder of the flight.

The severe turbulence encounter resulted in one cabin crew member receiving injuries to their left ankle. The individual had been in the aft galley when the commander gave the instruction for the crew to take their seats. Unable to immediately stow their catering cart, the crew member applied the cart's brakes and attempted to wedge it in a safe place. While securing the cart the crew member's foot and ankle became trapped beneath it. Their foot remained wedged until the turbulence subsided sufficiently to allow other crew members to help free them.

After consulting with Medlink, the commander decided to continue the flight to Manchester where the injured party received hospital treatment for a broken ankle. It later emerged that one other cabin crew member had suffered bruising to their back and shoulders that had not been apparent at the time.

Post-flight checks revealed minor surface damage to the aircraft's radome.

Meteorology

The significant weather forecast chart for the flight (Figure 1) indicated that occasional, isolated and embedded cumulonimbus (CB) clouds could be expected until passing waypoint DRYED, approximately 2 hours and 30 minutes into the flight. The presence of CB clouds implies a risk of thunderstorms and hail as well as moderate or severe turbulence and icing.

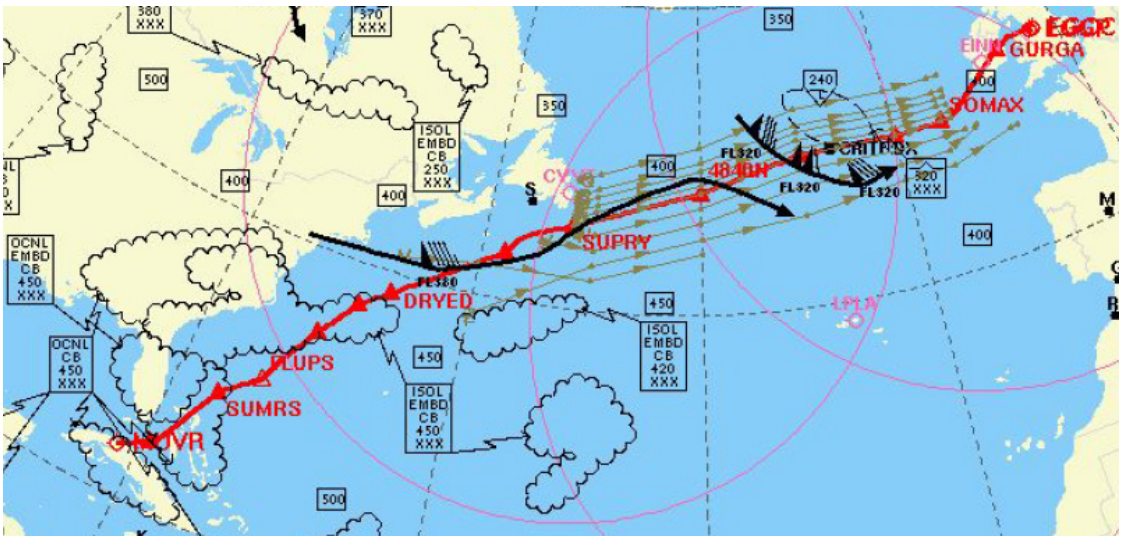

Figure 1

North Atlantic Significant Weather Chart valid 00 UTC 3 Aug 2019

Analysis

The flight crew were aware of the risks associated with CB clouds and were using their aircraft's weather radar to plan avoidance routings. The onset of severe turbulence was rapid and unexpected. Had the seat belt signs not already been illuminated, it is possible that more people would have been injured in the incident.

Conclusion

This was an unexpected turbulence encounter while avoiding areas of known CB activity. It is likely that the number of injuries would have been greater had passengers been moving around the cabin at the time.