Incident

Aircraft Type and Registration:	Boeing 737-8200, EI-HGG	
No & Type of Engines:	2 CFM LEAP-1B27 turbofan engines	
Year of Manufacture:	2019 (Serial no: 62316)	
Date & Time (UTC):	8 March 2024 at 1345 hrs	
Location:	London Stansted Airport	
Type of Flight:	Commercial Air Transport (Passenger)	
Persons on Board:	Crew - 6	Passengers - 172
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None	
Commander's Licence:	Air Transport Pilot's Licence	
Commander's Age:	43 years	
Commander's Flying Experience:	3,270 hours (of which 1,945 were on type) Last 90 days - 160 hours Last 28 days - 54 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

After a manually flown go-around and missed approach procedure, the co-pilot handed control to the commander to allow the co-pilot to set up the Flight Management Computer for the next approach. However, the commander did not realise that the autopilot and autothrust were not engaged. The aircraft subsequently started a descent which was not noticed by either member of the crew. The aircraft descended about 550 ft before this was noticed and action taken to correct it. As this was more than 200 ft from the aircraft's cleared altitude, this was classified as a level bust. This was a result of an incorrect procedure being used during the handover of control and the commander monitoring the co-pilot's actions, rather than the aircraft.

The circumstances surrounding the occurrence did not fall within the definitions of an accident or serious incident as defined in ICAO Annex 13, however, the Chief Inspector, in exercise of his powers under the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2018, initiated an investigation, treating the occurrence as an incident to highlight the safety benefits from the safety actions taken by the operator by amending its handover procedure in its operating manual.

History of the flight

The aircraft was on a scheduled flight from Szczecin Airport, Poland to London Stansted Airport. The flight was uneventful until the ILS approach into Stansted, which was flown by the co-pilot. At the time Runway 04 was in use, the weather was fine, and the wind was from 080° at 15 kt.

With the aircraft stable at 500 ft radio altitude, the PF disconnected the autopilot (A/P) and autothrottle (A/T). At about 240 ft the approach became unstable; the IAS was just below V_{REF} and the aircraft was drifting above the glideslope (GS). Despite the PF positively trying to correct the IAS and the GS, the commander felt the aircraft would land deep. As a result, he called "GO-AROUND", which the PF initiated at about 15 ft agl. The go-around (GA) was then manually flown to 3,000 ft amsl, in accordance with the published missed approach procedure (MAP).

Once the aircraft had levelled at 3,000 ft, and before a left turn that was part of the MAP had been initiated, ATC asked the crew the reason for the GA, and if they were happy to make a second approach. At this time the flaps were still extended at Flaps 1. The PM replied that they had "GOT A BIT UNSTABLE" and that they were happy to make a second approach. ATC responded by instructing the aircraft to turn left on to a downwind heading. The commander then asked the co-pilot if he wanted to fly the second approach, which he agreed to do. Having discussed who would set up the Flight Management Computer (FMC) for the second approach, the co-pilot said he would.

The commander then declared "I HAVE CONTROL" and the co-pilot responded, "YOU HAVE CONTROL". However, the co-pilot did not state that the A/P and A/T were not engaged. Shortly thereafter, while the aircraft was still in the left turn, the commander noticed that the aircraft was descending and had descended about 550 ft. He promptly took control and climbed the aircraft back to 3,000 ft; the aircraft had descended 600 ft in total during the descent. The A/P and A/T were then engaged, and the commander then elected to fly the approach and landing, which was uneventful. At the time of the level bust the ATCO was co-ordinating the next departure with a colleague and did not notice it.

When the level bust occurred, there was a helicopter that was operating VFR outside controlled airspace at 2,000 ft amsl, that was inbound to Stansted. The helicopter was subsequently cleared to enter the Stansted Controlled Traffic Region (CTR) "NOT ABOVE 2,000 FT AMSL"

Pilots' comments

Commander's comments

The commander commented that ATC did not put any pressure on them, despite a quick decision being made to conduct another approach. He added that in hindsight they should have asked for more time to ensure the GA and MAP had been fully completed, which would probably have ensured that the A/P and A/T were engaged, as they should have been by the PF at the time.

He was familiar with the correct handover procedure and realised that the handover of control should have been completed in line with the Flight Crew Operations Manual (FCOM) procedure to ensure the state of the aircraft was clear at handover. He added that he should have checked the Flight Mode Annunciations (FMA).

Co-pilot's comments

The co-pilot said that this was the first time he had handed over control during manual flight and that he did not know the precise call outs that were stated in the FCOM. Whilst he did not highlight the fact that he was manually flying he assumed the commander realised this.

Organisational information

The operator's FCOM stated the following with how control of the aircraft is handed over in manual flight and automatic flight:

> *'**Handover of Control***
>
> *The PF must clearly state the AFDS and A/T status by reading the FMA from left to right before handing over controls. Example, manual flight; "You have control, autopilot and autothrottle disengaged, LNAV, VNAV, descending FL 100". Example, autopilot and autothrottle engaged; "You have control, Command A, N1, LNAV, VNAV, maintaining FL 370." '*

There was no formal reply stated in the FCOM for the PM. However, it is common practice in all areas of aviation to reply "I have control", once control has been taken. As a result of this incident the operator has amended this *Handover of Control* procedure to add a PM response, "I have control", to positively confirm the transfer of aircraft control and PF responsibilities.

The FCOM also stated that after a GA, the A/P and A/T can be engaged after the flaps have been retracted and the aircraft has levelled off at the Missed Approach Altitude.

ATC

The event was notified to NATS by the AAIB. NATS confirmed it was a level bust event given the aircraft had deviated by more than 200 ft from its ATC clearance.

The short duration of the level bust was not noticed by the ATCO. However, NATS commented that whilst ATCOs can be alerted to level busts by a *Vertical Displacement Advisory Tool* (VDAT) this is only applicable above 6,500 ft amsl to prevent spurious alerts, primarily against step climb in Standard Instrument Departures and ILS arrivals.

As the inbound helicopter was operating VFR outside the Stansted CTR at the time of the level bust, no separation minima was applicable between the aircraft. This would have also applied when it was subsequently operating within the Stansted CTR, as it would have been under a VFR clearance.

NATS commented that there was also a Short Term Conflict Alert (STCA) available to the ATCO. STCA is designed as a collision avoidance safety net, not a separation assurance tool. The objective of STCA is to provide ATCOs with sufficient advance warning of a potentially hazardous confliction to enable timely action to be taken and thereby safely resolve the situation. STCA detects potential conflict only between tracks that are displaying SSR data associated with level information. On receipt of an STCA alert, controllers are to assess whether the alert is valid and are to initiate an appropriate resolution action.

On this occasion the defined parameters for an STCA between the respective aircraft profiles were not met and therefore an STCA did not activate between EI-HGG and the helicopter. NATS measured the closest point of approach between the two aircraft as 1.7 nm and 300 ft. This geometry can still give appropriate safety margins, for example for a VFR aircraft versus an IFR aircraft in Class D airspace.

Recorded data

The CVR was downloaded at the AAIB's laboratory and provided information for the history of the flight.

Data from the operator's Flight Data Monitoring program was provided for the flight. There was nothing abnormal during the approach, and the parameters recorded during the GA appeared to reflect normal operation of the aircraft.

Analysis

The decision to initiate a GA at a low height was appropriate given the aircraft became unstable, and the commander believed the aircraft would land deep.

After the GA and the first part of the MAP had been completed, with the aircraft being flown manually, the PF handed over control without using the correct procedure laid down in the FCOM as he did not know what the precise calls should have been, and assumed the PM was aware the A/P and A/T were not engaged. However, the full GA procedure, including retracting the flaps, and potentially re-engaging the A/P and A/T, was not completed prior to this. The event highlights the importance of knowing the procedures that are in an operator's manual and to check that both pilots share a common mental model.

A PF is responsible for the safe conduct of the flight, especially if the PM is 'heads down' loading an approach procedure in the FMC. This can only realistically be done by monitoring the aircraft's flight instruments and not while trying to monitor the PM's actions at the same time, especially when the A/P is not engaged. Had he done so, he may have been better placed to notice the descent before the aircraft lost a significant amount of height. The PM is also responsible for monitoring the conduct of the flight, and whilst it is accepted that he may be heads down while completing some cockpit tasks, they should always allow themselves time to review the flight instruments from time to time. If the PM's actions needed to be checked or carried out on his behalf, control of the aircraft should have been handed back over. Additionally, if an incorrect procedure is used the pilot should challenge the other pilot to clarify what their intentions are to avoid any possible misunderstanding.

This incident also shows that distractions and quick decisions can lead to a loss of control of an aircraft, even for a small period of time. In this case 600 ft of height was lost and it came within 300 ft and 1.7 nm of VFR helicopter traffic that was routing to Stansted, with both aircraft maintaining the correct safety margins. The short-duration level bust was not noticed by the ATCO at the time as they had their attention focused on co-ordinating the next departure with a colleague.

Conclusion

Having levelled off after a GA, the aircraft descended 600 ft from its cleared altitude. This was a result of an incorrect procedure being used during the handover of control and the commander monitoring the co-pilot's actions, rather than the aircraft.

Safety actions

As a result of this incident the operator took the following safety action in September 2024:

> Expanded the '*Handover of Control'* guidance in their Boeing 737-NG and Boeing 737-8200 Flight Crew Operations Manual with a PM response, "I have control", to positively confirm the transfer of aircraft control and PF responsibilities during manual flight and in automatic flight.