

AAIB Bulletin S9/2013

SPECIAL

ACCIDENT

Aircraft Type and Registration:	Eurocopter EC135 T2+, G-SPAO	
No & Type of Engines:	2 Turbomeca Arrius 2B2 turboshaft engines	
Year of Manufacture:	2007 (Serial No: 0546)	
Location	Glasgow City Centre, Scotland	
Date & Time (UTC):	29 November 2013 at 2222 hrs	
Type of Flight:	Commercial Air Transport	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - 1 (Fatal)	Passengers - 2 (Fatal) Other - 6 (Fatal) - 12 (Serious)
Nature of Damage:	Helicopter destroyed	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	51 years	
Commander's Flying Experience	5,592 hours (of which 646 ¹ were on type) Last 90 days - 38 hours Last 28 days - 19 ² hours	
Information Source:	AAIB Field Investigation	

Footnote

- ¹ 646 hrs are the hours on type the pilot had accumulated since 2010.
² Hours up to and including 26 November 2013.

This Special Bulletin contains facts which have been determined up to the time of issue. It is published to inform the aviation industry and the public of the general circumstances of accidents and serious incidents and should be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

Notification

The Air Accidents Investigation Branch (AAIB) was notified at 2259 hrs on 29 November 2013 that a helicopter had crashed through the roof of a bar, The Clutha Bar, in the centre of Glasgow. A team of AAIB Inspectors and support staff arrived in Glasgow at 0915 hrs the following morning to commence an investigation.

In accordance with established international arrangements, the Bundesstelle für Flugunfalluntersuchung (BFU) of Germany, representing the State of Design and Manufacture of the helicopter, and the Bureau d'Enquêtes et d'Analyses pour la Sécurité de l'Aviation Civile (BEA) of France, representing the State of Design and Manufacture of the engines, appointed Accredited Representatives to participate in the investigation. They are supported by advisors from the BEA, the helicopter manufacturer and the engine manufacturer. The European Aviation Safety Agency (EASA), the UK Civil Aviation Authority (CAA) and the helicopter operator are also assisting the AAIB. Contact has been established with the National Transportation Safety Board (NTSB) of the USA, pending assistance from equipment manufacturers.

The investigation is being conducted under the provisions of *Regulation EU 996/2010* and the UK *Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996*.

This Special Bulletin provides initial information on the investigation. No analysis of the facts has been attempted.

History of the flight

At 2045 hrs on 29 November 2013, the helicopter departed Glasgow City Heliport (GCH), where it was based, to support police operations. On board were the pilot and two police observers. The pilot had been informed that there were no technical issues with the helicopter, which contained 400 kg of fuel.

Initially, the helicopter routed towards a location on the south side of Glasgow city centre, about 2 nm south-east of GCH. It remained in that area, at an altitude of approximately 1,000 ft amsl, for about 30 minutes. It then transited to Dalkeith, Midlothian, about 38 nm east of GCH, where it remained for a further 10 minutes, at various altitudes, before returning to Glasgow via Bothwell, South Lanarkshire and Bargeddie, North Lanarkshire. At 2218 hrs, the pilot requested clearance from ATC to re-enter the Glasgow Control Zone and return to GCH; this was approved. No further radio transmissions from the pilot were received.

Radar contact with the helicopter was lost at 2222 hrs. Around this time, the helicopter was seen and heard by a witness who described hearing a noise like a loud "misfiring car", followed by silence. He then saw the helicopter descend rapidly. It crashed through the roof of The Clutha Bar, a single storey building on Stockwell Street in central Glasgow. The three occupants of the helicopter and six people in or adjacent to the bar were fatally injured. Thirty-two other people suffered injuries, twelve seriously³.

Footnote

³ As defined by ICAO Annex 13 and the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996, which are accessible from the AAIB website.

Weather

At 2050 hrs, about 5 minutes after the helicopter took off from GCH, the weather at Glasgow International Airport (GIA), 4.5 nm west of GCH, was: visibility greater than 10 km, with the wind from 280° at 9 kt, FEW clouds at 4,000 ft, temperature 6°C, dew point 2°C and the QNH was 1024 hPa.

At 2220 hrs the weather at GIA was CAVOK with the wind from 300° at 7 kt, temperature 5°C, dew point 2°C and the QNH was 1025 hPa.

Helicopter information

The Eurocopter EC135 T2+ is a multi-purpose light helicopter, powered by two Turbomeca Arrius 2B2 turboshaft engines. These full-authority digital electronic control (FADEC) equipped engines, drive a four-bladed main rotor and fenestron tail rotor. In this case, G-SPAO was fitted for police air support operations.

Preliminary engineering investigation

The initial evidence indicated that the helicopter struck the flat roof of the single story building with a high rate of descent and low/negligible forward speed. Preliminary examination showed that all main rotor blades were attached at the time of the impact but that neither the main rotor nor the fenestron tail rotor were rotating.

The impact forces caused the roof of the bar to collapse and the helicopter entered the building; its forward section coming to rest on and amongst building debris. Very extensive damage and disruption of the helicopter structure and components resulted from the impact forces and from contact with the collapsing building. The helicopter did, however, remain approximately upright.

Working closely with the emergency services and

the authorities in Glasgow, the AAIB conducted a preliminary examination of the helicopter, within the collapsed area of the building. Thereafter, the damaged sections of building structure were shored up and made safe, enabling closer examination to be carried out. Building debris was then progressively removed allowing additional access to be gained. However, the state of the building limited the extent to which examination of the helicopter was possible in situ.

After further debris removal and cutting off the main rotor blades, it was determined that the helicopter structure remained sufficiently robust for it to be lifted clear of the building by means of a crane, using strops attached to the main rotor head.

Once removed from the building, approximately 95 litres of fuel were drained from the fuel tank system.

Initial examination was carried out at the site, before the helicopter was transported to the AAIB's headquarters. Examination continued on its arrival at Farnborough, Hampshire, where it was confirmed that all significant components were present at the time of impact. Initial assessment provided no evidence of major mechanical disruption of either engine and indicated that the main rotor gearbox was capable of providing drive from the No 2 engine power turbine to the main rotor and to the fenestron drive shaft. Clear impact distortion of the structure had caused a splined shaft on the drive train from the No 1 engine to disengage, preventing a similar continuity check.

Detailed examination of the helicopter continues.

Recorded data

The helicopter was not required to have and was not fitted with flight recorders, nor did its systems provide

a continuous recording of helicopter parameters. However, some systems record fault codes, as they occur, in memory that is not crash-protected. Those, and systems that can record camera images and audio, will be examined and analysed.

Radar data covering the helicopter flight has been recovered. That and radio communications are also being analysed, and closed-circuit television recordings will be reviewed.

Published on 9 December 2013

Special Bulletin Correction

The following correction to the Special Bulletin was issued on 9 December 2013.

The section on **Weather** originally stated:

At 2150 hrs, about 5 minutes after the helicopter took off from GCH, the weather at Glasgow International Airport (GIA), 4.5 nm west of GCH, was CAVOK with the wind from 300° at 8 kt, temperature 6°C, dew point 2°C and the QNH was 1025 hPa.

Ongoing investigation

The AAIB investigation will continue to examine all the operational aspects of this accident and conduct a detailed engineering investigation of the helicopter. The AAIB will report any significant developments as the investigation progresses.

It should have read:

At **2050 hrs**, about 5 minutes after the helicopter took off from GCH, the weather at Glasgow International Airport (GIA), 4.5 nm west of GCH, was: **visibility greater than 10 km**, with the wind from **280° at 9 kt**, **FEW clouds at 4,000 ft**, temperature 6°C, dew point 2°C and the **QNH was 1024 hPa**.

AAIB investigations are conducted in accordance with Annex 13 to the ICAO Convention on International Civil Aviation, EU Regulation No 996/2010 and The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996.

The sole objective of the investigation of an accident or incident under these Regulations is the prevention of future accidents and incidents. It is not the purpose of such an investigation to apportion blame or liability.

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

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