

Hard landing following autorotation Hélicoptères Guimbal Cabri G2, PH-HCC

low flying area Flevopolder, 29 April 2022

Occurrence

PH-HCC, a Hélicoptères Guimbal Cabri G2, was conducting a local training flight from Lelystad Airport. Onboard the helicopter were an instructor and a student pilot. During the demonstration of a standard autorotation (simulated landing with engine failure), the helicopter made a hard landing, resulting in damage to the landing gear. Both occupants remained unharmed.

At the start of the autorotation, in the training area southwest of Lelystad Airport, the aircraft was flying at an altitude of about 1,200 feet. After reviewing the autorotation procedure with the student pilot, the instructor simulated an engine failure by selecting the engine power to minimum. At approximately 400 feet, the instructor added engine power to terminate the autorotation and initiate a climb.

The instructor reported attempting to apply power twice, but the engine did not respond. Given the low altitude, he decided to treat the exercise as an emergency situation. During the finalization of the maneuver, the instructor attempted to select power one or two more times, during which the engine appeared to respond limitedly. During the landing, the engine provided power, and the helicopter's nose turned left, resulting in a sideward hard landing that damaged the left skid.



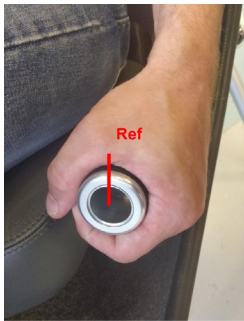
▲ The left skid. (Source: Helicentre)



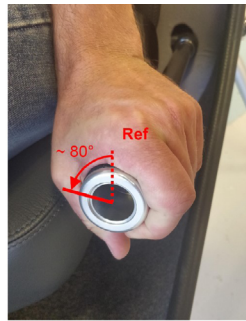
▲ The helicopter after the hard landing. (Source: Helicentre)

The helicopter

The Cabri G2 is equipped with a system⁵ that reduces the pilot's workload by automatically regulating engine rpm; this system also functions during an autorotation. The system can be deactivated by turning the throttle completely to the (idle) mechanical stop. If the throttle is not fully turned to the stop, the system remains active. The throttle is designed to require a turn of about 160 degrees to go from the normal flight position to the stop. The service letter⁶ describes that with a normal grip on the throttle, it is only possible to turn the throttle 80 degrees. To achieve the full 160-degree turn, Hélicoptères Guimbal describes two options. The first is to perform the turn in two movements, and the second is to grip the throttle differently to achieve the full turn in one movement.



Normally positioned hand



Maximum twist grip rotation from a normal position toward idle

▲ The throttle. (Source: Hélicoptères Guimbal)

Both the flight manual and the service letter issued by Hélicoptères Guimbal warn of managing the throttle during simulated engine failures (autorotations). The service letter was issued following a couple of incidents where the throttle was not fully turned to the stop. These incidents led to a loss of directional control at the end of the maneuver because the engine was providing power. The helicopter's nose turned to the left during these instances.

The technical investigation indicated that the helicopter, engine, and engine controls showed no anomalies. Despite the technical investigations, the Investigation Board cannot entirely rule out that there are circumstances in which the system may respond differently. The preflight inspection conducted before the flight revealed no issues according to the instructor. Given these findings, the Investigation Board remains cautious in drawing definitive conclusions about the exact cause of the incident, emphasizing that further analysis or additional investigation may be required.

Instructor

The instructor trained both private and commercial helicopter pilots. He held a Commercial Pilot License (CPL) with over 200 flight hours and an FI (Flight Instructor) rating.

Analysis

During a simulated engine failure (autorotation), the helicopter was damaged when the engine unexpectedly provided power during recovery, causing the helicopter's nose to turn left. The technical investigation confirmed that the helicopter and engine were in good condition. The flight manual and the service letter issued by Hélicoptères Guimbal specifically warn about managing the throttle during simulated engine failures. The throttle is designed so that a turn of about 160 degrees is needed to move it from the normal flight position to the stop. However, with a normal grip, only an 80-degree turn is possible. Hélicoptères Guimbal describes two methods to complete the full 160-degree turn.

⁵ Pitch/Throttle correlator

⁶ Hélicoptères Guimbal, *CABRI G2 Service letter 19-001, Throttle management during simulated engine failure*, February 2019.

The instructor stated that he had fully closed the throttle when initiating autorotation. He also mentioned making several attempts to return the throttle to the normal position during the autorotation, but the engine did not seem to respond. However, during the recovery of the maneuver, the engine suddenly provided power, resulting in an abrupt turn of the nose to the left.

The most likely scenario is that the design and management of the throttle led to it not being fully turned to the stop, keeping the system active. This resulted in the unexpected provision of power during the recovery of the maneuver. Despite awareness of the potential risks associated with the design and management of the throttle, this incident occurred. The Investigation Board, therefore, reiterates the warnings and recommended measures described in the service letter to mitigate the risk of similar occurrences.

Classification: *Accident*

Reference: *2022028*

Hard landing near rain shower, Britten-Norman BN-2B-20 Islander, PJ-WEB

Juancho E. Yrausquin Airport, Saba (Caribbean Netherlands), 13 February 2023

An Islander aircraft en route from Sint Maarten (TNCM) to Saba (TNCS), struck the ground to the left and approximately one metre before the threshold of Runway 12. The aircraft subsequently made a hard landing on the runway. During the landing, the aircraft sustained extensive damage to the gear struts and wing structure. The occupants, including the pilot, two passengers and a dog disembarked without injuries.

History of the flight

The flight departed Sint Maarten 11.01 hours.⁷ Eight minutes into the flight, the Aerodrome Flight Information Service (AFIS)⁸ officer at Saba informed the pilot of the Islander that rain showers east of the airport would move over the airport in a few minutes. The pilot responded that he had the rain showers in sight and that he expected to land before them. At 11.12 hours, the aircraft turned onto final and the pilot asked for the latest wind. He was informed by the AFIS that the wind was from direction 120 degrees at a speed of 21 knots. The aircraft landed one minute later.

The on-duty AFIS officer observed the aircraft during the final approach and witnessed the hard landing. He asked the pilot over the radio if everything was okay, to which the pilot responded with 'negative'. The pilot managed to taxi the aircraft to the turnaround parking spot on the ramp.

⁷ All times are depicted in Universal Time Coordinated (UTC).

⁸ AFIS is the term used to describe the provision of information useful for the safe and efficient conduct of aerodrome traffic at those aerodromes where the appropriate authority determines that the provision of aerodrome control service is not justified, or is not justified on a 24-hour basis.