

No: 4/84

Ref: EW/C864/01

Aircraft type and registration:	Westland SA341G Gazelle G-SFTA (light single engined helicopter)	
Year of manufacture:	1973	
Date and time (GMT):	7 March 1984 at 0835 hrs	
Location:	3nm South of Alston, Cumbria	
Type of flight:	Training	
Persons on board:	Crew — 2	Passengers — Nil
Injuries:	Crew — Slight	Passengers — N/A
Nature of damage:	Substantial damage to skids, rotor blades, tail boom and cabin structure	
Commander's Licence:	Airline Transport Pilot's Licence (Helicopters)	
Commander's Age:	46 years	
Commander's total flying experience:	6000 hours (of which 120 hours were on type)	

The helicopter took off from Carlisle Airport at 0800 hrs on a navigational training sortie which was to simulate the pick up of troops at various points on the route. About 18 minutes after take-off the student had identified a pick up point near a barn and he was told by his instructor to look for a suitable landing area. They flew past the barn at 40 to 50 kts with a slight left bank at about 100 to 150 feet agl. The helicopter started to yaw to the left at an increasing rate with the airspeed reducing. The instructor reached for the controls and asked the student what he was doing. The student replied that he had lost control. By now despite the full right pedal and forward cyclic applied by the instructor the helicopter was rotating to the left and descending. The instructor raised the collective just before the helicopter, nose down and right skid low, hit the ground and rolled over onto its right side. The crew shut down the engine and electrics before vacating the aircraft. After evaluating the fire risk and ensuring that there was no fuel spillage the instructor contacted 'London Information' on the radio and informed them of the situation. The crew then walked down the hillside to the nearest habitation. The cloud base above the crash site was assessed as 200 to 300 feet agl and the visibility was greater than 3 miles. There was no wind.

The helicopter was recovered from the hillside to the AIB Engineering Facility at Farnborough where extensive tests were carried out. There was no apparent defect in any of the helicopter systems, and the engine and transmission would still run satisfactorily.

Research into uncontrollable yaw situations involving the Gazelle revealed eight previous incidents or accidents, all involving military helicopters. In all cases rotation of the fuselage was to the left but the manoeuvre that led up to the loss of yaw control varied considerably. From these previous occurrences it was considered that the helicopter was most susceptible to loss of yaw control when the relative wind was between 40° and 120° from the right, and when its velocity matched the velocity of the slipstream from the Fenestron tail rotor. In these circumstances re-circulation of the airstream around the Fenestron would take place, causing loss of tail rotor thrust. However, extensive trials in 1978/79 on behalf of the Ministry of Defence both at Boscombe Down and in France failed to reproduce this loss of yaw control.

In the case of G-SFTA the approach to the proposed landing site was over rising ground. The aircraft was in a gentle left bank and both pilots were looking left towards the proposed landing site. The last recollection of airspeed that the crew had before the uncontrolled yaw took place was 40 knots. The student states that he started to apply power and right pedal shortly after last looking at the airspeed. Soon afterwards despite progressive right pedal, and lowering the lever the helicopter rotated uncontrollably to the left.