Aviation Safety Investigation Report 199703877

Hughes Helicopters
Hughes 300

27 November 1997

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Occurrence Number: 199703877 **Occurrence Type:** Accident
Location: 7.5km SW Orroroo
State: SA **Inv Category:** 4
Date: Thursday 27 November 1997
Time: 1150 hours **Time Zone** CSuT
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	1	0	0	0	1
Total	**2**	**0**	**0**	**0**	**2**

Aircraft Manufacturer: Hughes Helicopters
Aircraft Model: 269C
Aircraft Registration: VH-UOS **Serial Number:** 500927
Type of Operation: Commercial Spotting - Other
Damage to Aircraft: Destroyed
Departure Point: Orroroo SA
Departure Time: 1130 CSuT
Destination: Orroroo SA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL	2600.0	11500

Approved for Release: Wednesday, April 22, 1998

The helicopter operator was hired by a government organisation to assist with locust plague control. The helicopter pilot was required to fly at low level to assess locust numbers in areas identified by ground personnel. When the pilot or his observer reported adequate densities of locusts, the area locust plague controller would dispatch a fixed wing agricultural aircraft to spray the locusts with insecticide.

The accident occurred on the pilot's second day on task. Flying commenced at about 1000. The pilot ferried his helicopter from Quorn to Orroroo, a distance of 42 km, and landed. Then he flew a solo reconnaissance flight for approximately 35 minutes, before returning to Orroroo airstrip. There, an observer boarded for a flight expected to last about 10 minutes. When the helicopter had not returned to the airstrip after about 20 minutes and there was no radio contact, the pilot of an agricultural aeroplane commenced an airborne search. He soon found the helicopter, crashed and on fire in an oat crop.

Evidence at the crash site showed that the helicopter had been tracking approximately south when it collided at about 90 degrees with a single power line, 27 ft above the ground. The wire snagged on the forward crossbeam of the skid landing gear. The wire stretched but did not break as it pulled the helicopter to the ground in a nose low attitude. At impact the main rotors struck the ground and the instrument console shattered the forward portion of the perspex windshield. The still unbroken powerline then flipped the helicopter backwards along its flight path where it impacted the ground inverted. During the impact sequence the muffler was dislodged and the fuel system ruptured. A nearby farmer reported that she heard the helicopter's engine continue to run for a short time after the unexpected loss of her household electrical power. Aviation gasoline (AVGAS) was ignited and the aircraft was consumed by fire. The three strand, high tensile, steel wire comprising the powerline did not break until it was weakened by the intense heat of the post impact fire.

The pilot was suitably qualified to conduct the flight. He was not considered to have been suffering from fatigue, nor was he subsequently found to have been suffering any medical problem which may have contributed to the accident.

No fault was subsequently found with the helicopter airframe or engine which may have contributed to the accident.

Personnel who arrived at the crash site within minutes of the accident reported that the weather was fine. Visibility was excellent, the wind was almost calm, the sun was high overhead, and there was no cloud. The absence of splattered locusts on recovered unburnt pieces of the perspex windshield/canopy found near the first point of ground impact, indicated that the pilot's forward visibility was probably not significantly obstructed by the windshield immediately prior to the accident.

The power line struck by the aircraft was an east/west spur line spanning 400 m between poles. The nearest pole to the crash site was 186 m to the west. This pole was also supporting a prominent powerline parallelling a gravel road heading south west. In contrast, the pole at the eastern end of the spurline was near a farm house and outbuildings, 214 m east of the accident site. The farm house was close to another gravel road heading south but there was no powerline associated with this road.

On the morning after the accident, investigators noticed many locusts within the oat crop and on the ground but few in the air. Later in the day the locusts became airborne and the enormity of their numbers became obvious. To locate and assess the density of locusts the task often required the helicopter pilot to fly low. There may appear to be few if any locusts in a suspected plague area because they could be within the pasture or crop, or on the ground. When the helicopter collided with the powerline, the pilot was probably in the process of descending low over the crop, expecting the rotor downwash to disturb the locusts enough to prompt them to take flight.

The helicopter was not equipped with any form of wire strike protection system (WSPS) or warning device to detect a powerline. A WSPS was not a requirement in the contract. No known WSPS exists for the Hughes 300. In this occurrence, a WSPS fitted helicopter would probably have cut the wire and survived with little damage to the airframe and no injury to personnel. In previous years, helicopters contracted for the same work had been fitted with WSPS.

A WSPS does not eliminate the possibility of an accident or injury as a result of a wire strike by a helicopter, but it reduces the risk. The safety value of the WSPS has been recognised more in recent years; WSPS is now routinely fitted to military, fire fighting, search and rescue, police and ambulance helicopters.

Electronic powerline detection devices are being developed for aircraft. They may enhance safety for future low level operations by providing pilots with warning of a powerline ahead of the aircraft. Some successful trials have already been conducted in Australia.

The pilot would probably have had difficulty detecting the powerline due to the long span of the single wire. It is possible that he either did not see the wire at all, or he may have seen it too late to successfully achieve avoiding action.