Aviation Safety Investigation Report 199800219

Hughes Helicopters
Hughes 300

16 January 1998

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Aviation Safety Investigation Report

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Occurrence Number: 199800219 **Occurrence Type:** Accident
Location: 1km W Abbotsham
State: TAS **Inv Category:** 4
Date: Friday 16 January 1998
Time: 0940 hours **Time Zone** ESuT
Highest Injury Level: Fatal
Injuries:

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

Aircraft Manufacturer: Hughes Helicopters
Aircraft Model: 269C
Aircraft Registration: VH-DGD **Serial Number:** 400917
Type of Operation: Commercial Aerial Agriculture - Other
Damage to Aircraft: Destroyed
Departure Point: Devonport Tas.
Departure Time: 0600 ESuT
Destination: Abbotsham Tas.

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	400.0	6000

Approved for Release: Wednesday, August 19, 1998

The pilot was tasked to spray potato crops in northern Tasmania. On the morning of the accident he left the operator's Devonport base at approximately 0600 ESuT to spray crops in the Sassafras area. He was accompanied by a loader driver with a truck carrying fuel and the chemicals to be used on the day. The pilot was in the habit of taking just enough fuel for the current spraying task, returning to refuel and to load the chemicals as required for the next task.

When the spraying at Sassafras was completed the operation moved to the Kindred area arriving there at about 0800. The pilot completed two runs before departing at about 0915 to spray a crop at Abbotsham.

Abbotsham is a settlement straddling Castra Road, 4 km S of Ulverstone. The crop to be sprayed consisted of two paddocks, 200m apart to the east of Castra Road, at the southern end of the settlement. In accordance with the Code of Practice for Aerial Spraying in Tasmania the paddocks were marked with prominently displayed identification numbers and the pilot had been supplied with a map of the area containing the numbers.

The pilot did not arrive at the Abbotsham property but was seen to commence spraying a paddock on the eastern side of Top Gawler Road, 1km W of Abbotsham. The paddock being sprayed was not normally subject to aerial spraying and did not display any identification numbers. The pilot commenced spraying in an east-west direction before turning to spray to the south.

Shortly after turning to the south the helicopter was seen to strike the second of two sets of power lines running east-west across the paddock, approximately 30ft above the crop. The helicopter was seen to tip forward and then level out momentarily before nosing over and crashing inverted into the crop. Witnesses to the accident immediately notified emergency services, however the pilot had not survived the impact.

The helicopter was destroyed by impact forces but did not catch fire.

Examination of the wreckage determined that the helicopter's fuel tank contained fuel and the engine was delivering power at the time of principle impact. No fault was found with the airframe.

The power line had dragged across the top of the skids before snagging on the forward cross beam. This resulted in the helicopter pitching nose down. The tail rotor mechanism was severed from the tail boom by a main rotor blade, most probably when the pilot pulled back on the control column to counter the nose down pitch. This action is supported by the witnesses who saw the helicopter level out momentarily after the power line strike.

The pilot held a commercial pilot's licence with agricultural ratings for both fixed wing and helicopter operations. He had flown helicopters in excess of 6,000 hours, more than 1,000 of which were on agricultural operations.

The operator advised that this was the pilot's fourth season spraying potato crops in Tasmania and that his demeanor was normal on the morning of the accident. The post mortem examination did not disclose any medical anomaly that may have affected the pilot's ability to carry out the task.

The weather at the time of the accident was fine and mild with no wind and no cloud cover. There were no known visual limitations in the area.

It is not known why the pilot was spraying the wrong crop. He may have mistaken Top Gawler Road for Castra Road because both roads ran in the same direction, but were parallel to each other and were only 1 km apart. However the property on Top Gawler Road was not adjacent to a settlement, nor was it marked in accordance with statutory requirements.

It could not be determined why the pilot failed to see and avoid the second set of powerlines. Both sets of lines were supported by poles on the brow of a hill adjacent to the crop. The first pole held four wires, while the second held three, one of which was supported between and above the other two. The helicopter collided with the upper wire on the second pole. It may be that the pilot misjudged the height of the powerline while manoeuvring around the crop in the rolling terrain that characterized the area.

The investigation considered a proposal from a concerned local resident that an electronic system be developed to warn pilots of the location, direction and height of wires. Some testing of an electronic powerline detection system has occurred but it is not as yet commercially available. Pilots flying crop spraying aircraft rely on visual reference for positioning and therefore must at all times be looking outside of the cockpit. Any electronic warning system would need to be compatible with the need for the pilot to keep his eyes outside of the helicopter.

Some helicopters types have available for fitting to them a wire cutting system known as a wire-strike protection system (WSPS). As far as could be determined, there is not an approved WSPS for the Hughes 269 helicopter. A standard helicopter WSPS consists of one wire cutter fitted on the roof of the cabin and a second cutter under the belly. A WSPS does not eliminate the possibility of an accident as a result of wire strike, but it does reduce the risk. The safety value of the WSPS has been recognized and they are routinely fitted to military, fire fighting, search and rescue, police and ambulance helicopters. Most helicopters used in those roles are larger and more sophisticated than the Hughes 269.

An existing method of alerting pilots to the presence of powerlines is the use of visual markers. Australian Standard 3891 contains standards for the visual marking of powerlines in low level agricultural operations. These standards are advisory only and in general have not been implemented by either the powerline owners or the aerial agriculture industry.

As a result of a similar accident in 1994 the Bureau recommended that the Civil Aviation Safety Authority:

(i) require the fitment of approved wire-strike protection system kits for all helicopters engaged in low flying activities for which a kit exists; and,

(ii) that only agricultural spray kits compatible with wire-strike protection systems be approved for fitment to these helicopters.

The Authority responded saying that while a wire-strike protection system (WSPS) may have been of benefit in that and similar accidents, the Authority believed that the fitment of WSPS should not be mandatory. However, CASA was of the view that it should be strongly encouraged when suitable equipment is available.

CASA, in conjunction with BASI, was prepared to undertake an industry education program highlighting the hazards associated with low level helicopter operations as well as the advantages provided by the fitment of WSPS to appropriate helicopters. These programs are ongoing.