TRANSPORT ACCIDENT INVESTIGATION COMMISSION
TE KOMIHANA TIROTIRO AITUA WAKA

AIRCRAFT ACCIDENT REPORT

No. 92-022

Hughes 269C

ZK-HOB

Kaniere, Hokitika

13 December 1992

Transport Accident Investigation Commission
Wellington · New Zealand

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Aircraft Type, Serial Number and Registration:	Hughes 269C, 1290862, ZK-HOB
Number and Type of Engines:	One Lycoming HIO-360-D1A
Year of Manufacture:	1979
Date and Time:	13 December 1992, 1815 hours
Location:	Kowhitirangi Road, Kaniere, 7 km south-south-east of Hokitika Latitude: 42°46' S Longitude: 171°01' E
Type of Flight:	Private
Persons on Board:	Crew: 1 Passengers: 2
Injuries:	Crew: 1 Serious Passengers: 2 Serious
Nature of Damage:	Substantial
Pilot in Command's Licence:	Commercial Pilot Licence (Helicopter)
Pilot in Command's Age:	42
Pilot in Command's Total Flying Experience:	4000 hours 3900 hours on type
Information Sources:	Transport Accident Investigation Commission field investigation

All times in this report are NZDT (UTC + 13 hours)

1. ABSTRACT

1.1 This report relates to the collision with power conductors by Hughes 269C helicopter ZK-HOB near Hokitika on 13 December 1992. The safety issues discussed in the report are: the need for the Civil Aviation Authority and the New Zealand Police to have the authority to require any person to undergo the appropriate tests to determine if alcohol or drugs may have affected their ability to fly an aircraft, and the need for compliance with the Flight Manual requirement for a shoulder harness to be available for the centre seat passenger of Hughes/Schweizer 269 series helicopters.

2. NARRATIVE

2.1 On the morning of the accident the pilot had commenced duty at about 0830 hours. He carried out a number of flights in ZK-HOB in conjunction with a local rafting operator, and transported equipment to a hill site for another client. These flights, which comprised some 3.5 hours flying, were uneventful. The pilot reported, however, that shortly after starting the engine in the morning it had run roughly and lost power for a brief period. The pilot considered this was due to temporary plug fouling which was a known problem.

2.2 The pilot returned to his base at Kokatahi at about 1300 hours. He had intended to lift some moss from a nearby property during the afternoon but decided to delay this task until the following morning on account of the freshening wind conditions.

2.3 At about 1330 hours, he took off from Kokatahi in ZK-HOB accompanied by a friend who flew with him regularly on moss picking work. A brief landing was made at Rimu to collect another friend who was also part of the moss picking team.

2.4 After spending some twenty minutes flying to, and inspecting, two moss blocks in the local area, the pilot landed and parked the helicopter at the nearby Lake Mahinapua Hotel.

2.5 The pilot's visit to the hotel at this time was to enable him to further some company business arrangements with the hotel owner. The afternoon was busy, and only limited opportunity was available for the necessary discussions. As a result the group remained at the hotel until about 1730 hours. The pilot recalled that his friends had a few beers but he drank only non-alcoholic beverages during the afternoon. The hotel owner, who was serving at the bar, reported that the pilot did not have any alcoholic refreshment.

2.6 After departure from Lake Mahinapua, the pilot flew ZK-HOB to Woodstock and landed adjacent to the Royal Mail Tavern. The landing was to make arrangements concerning the car belonging to one of the passengers, and a telephone call was also made to Kokatahi to ascertain the whereabouts of another friend. During the 20 minutes spent at the Tavern beers were served to the group before the pilot and passengers took off for the return flight to Kokatahi.

2.7 A number of witnesses observed ZK-HOB flying in the vicinity of Kaniere and manoeuvring in the area after arriving from the direction of Woodstock. One resident stated that the helicopter circled three times above her home and neighbouring properties at a height of about 100 feet. She was concerned at the low level at which the helicopter was operating. However the pilot denied flying the helicopter at 100 feet above any house.

2.8 Another witness at Kaniere heard the helicopter approach and went outside to watch its progress. The witness described the engine as "revving like it was working really hard" as the pilot brought the helicopter to a hover at a height of about 20 feet in an adjacent open area. The pilot stated that at no time was the engine operating at other than its normal rpm (green arc) and that he did not bring the helicopter to a 20 foot hover in any open area.

2.9 Shortly afterwards the helicopter climbed briefly then descended in the vicinity of a Garage across the road. The witness had seen the helicopter land on clear ground to the rear of the Garage on a previous occasion, and was surprised that although the helicopter "came in and swooped round and hovered, then swooped round", three times, no landing was made. The witness reported that apart from the impression of "over revving" the helicopter's engine seemed to be functioning normally. It appeared to the witness that the pilot was having difficulty in his attempts to land the helicopter. The pilot stated that he had not landed at the Garage on any previous occasion, and had only once landed at Kaniere. Other operators, flying a different helicopter type, regularly landed at the Garage to obtain fuel. He said that had he intended to land he would have had no difficulty in doing so.

2.10 A cyclist, riding north-west towards Kaniere along a straight section of the Kaniere — Kowhitirangi Road, had just passed a driveway leading to a farm house, about 2.5 km from Kaniere, when he saw ZK-HOB flying directly towards him. The helicopter had descended to a height of about 20 or 30 feet at the opposite end of the straight about 500 m away and as it approached it continued to descend slowly, moving up and down, while following the line of the road. The cyclist expected the pilot to climb the helicopter above him but this did not occur and it passed very low overhead. The engine noise sounded normal.

2.11 The cyclist looked behind him and noted that the helicopter was still descending. As he watched, he saw it suddenly pull up steeply and collide with three electricity supply wires which spanned the road at the junction with the farm driveway. The helicopter continued upwards briefly before falling to the ground some distance beyond the wires.

2.12 The cyclist stopped a passing car and alerted the driver and passenger to the occurrence of the accident. He then rode to the farm house to ensure that an ambulance had been called.

2.13 The farmer and his wife had both observed ZK-HOB approaching along the straight section of road, descending to an unusually low height. The farmer's wife, who was at the house, saw the helicopter strike the wires and recalled that "it just seemed to go up in the air and tumble" as it descended to the ground. She immediately telephoned the emergency services and then proceeded to the scene.

2.14 The farmer was at the cowshed, about 500 m from the accident site, when he first observed ZK-HOB. On hearing an impact, and realising that the power had been cut off, he rode immediately by motorbike, to the accident site.

2.15 The wires struck and severed by the helicopter were 6.6 m above road level. Each of the three conductors consisted of a steel core-wire surrounded by six aluminium strands. The nominal overall diameter of each conductor was 10 mm. The wires spanned the road at right angles. They led from a power pole on the northern side and were suspended above the edge of the driveway which ran in a south-westerly direction to the farm. The span comprised feeder lines linked to the 11,000 volt electrical distribution network which followed the northern side of the road to Kokatahi.

2.16 The canopy of ZK-HOB shattered at the time of the wire strike, and portions of conductor core-wire and strands were entangled tightly around the upper part of the rotor mast including the swash plate assembly and main rotor control linkages. The evidence suggested that once the collision occurred, the helicopter was rendered uncontrollable.

2.17 South-east of the wire span, in the direction of the helicopter's flight, there was a reed-filled ditch about 3 m wide, and waist-deep, between the grass verge of the road and a sloping bank covered with gorse and flax. The right skid and right side of ZK-HOB had struck the bank approximately 90 m beyond the wires. The helicopter had rolled into the ditch and nosed over, coming to rest inverted on its right side.

2.18 The pilot, who was wearing his shoulder harness and a helmet, and the centre-seat passenger, who was restrained by a lap-belt, were able to vacate the cockpit. Difficulty was experienced in undoing the twisted lap-belt of the right seat passenger who was submerged in the ditch initially. His head was supported above the water by the adjacent passenger until the seatbelt could be cut. Section II, Limitations (FAA Approved), of the Flight Manual for ZK-HOB stated:

"Shoulder harness and seat belt is required for center seat passenger".

Investigation of a previous fatal accident involving a Hughes 269C helicopter had shown that this requirement was likely to be overlooked, (see 3. Recommendations).

2.19 All three occupants sustained varying degrees of laceration and facial injury, and injuries to the chest, ankles, and feet. After receiving medical attention at Hokitika, they were transported to Greymouth by ambulance and admitted to Grey Hospital.

2.20 Police who attended the accident scene believed it necessary to determine whether the pilot's conduct of the flight may have been influenced by the consumption of alcohol. However, as the circumstances involved an aviation occurrence, no authority existed for them to request the pilot to undergo a breath test, or to provide a blood sample. Enquiries made by the Police at a senior level shortly after the accident, indicated that the Civil Aviation Authority also had no suitable jurisdiction to enable such immediate action to be taken. (See 3. Safety Recommendations).

2.21 The pilot stated that his flying of the helicopter was not influenced by the consumption of any alcoholic drink. He reported that after leaving

Woodstock he had flown ZK-HOB to Kaniere to locate a member of his work crew, but after flying overhead and observing that he was not at home had then circled several times over a property near the Garage where another work crew member lived. He had then departed for Kokatahi.

2.22 During the return flight, at a height of about 500 feet agl, the engine lost power suddenly. The pilot recalled lowering collective to enter auto-rotation, but finding that limited power was available decided to make a precautionary landing. The helicopter was above the Kokatahi road at this time, approaching the farm where the pilot had originally planned to lift out moss that afternoon.

2.23 The pilot reported that as a result of the partial power loss, he descended ZK-HOB along the road. There were open paddocks on each side of the road but the ground was likely to be swampy so he gradually reduced speed and height with the intention of following the driveway to reach the farm. His previous moss lifting operations had involved landings and departures from the eastern boundary of the property, and he stated he was unaware of the power lines leading from the road to the farm on the northern side. He recalled the speed as "about 40 knots". His final recollection was a sudden impact as ZK-HOB struck the wires.

2.24 Most of the power poles and lines on the northern side of the Kokatahi "straight", along which the pilot had descended, would have been readily visible to him. However, the power pole from which the feeder lines to the farm branched was likely to have been masked from the pilot's view during the latter stages of the flight, by a clump of roadside trees. In addition, the small diameter and grey colour of the wires rendered them difficult to see, particularly in the area where the collision occurred.

2.25 At the time of the accident the engine in ZK-HOB had accumulated approximately 50 hours in service. It had been installed in November 1992 with zero hours since complete overhaul. About two weeks before the accident some rough running and high fuel consumption was experienced. The fuel control unit was changed at this time which appeared to have remedied the problem.

2.26 The pilot reported, however, that further intermittent engine malfunction had included loss of power, occasional in-flight "missing", and the emission of blue smoke when the engine was running at about 1500 rpm. Oil had been noted in the vicinity of the exhaust outlet of the number 4 cylinder. He elaborated that the engine had been in service for about 35 hours when it began to consume about one litre of oil for every two or three hours flying and emit a lot of blue smoke when running at 2500 rpm. When he had examined the lower plug of the number 4 cylinder after a normal run down he found it very oily each time.

2.27 In anticipation of a possible need for a cylinder replacement an exchange unit had been dispatched to the engineering facility where ZK-HOB was maintained. If it proved necessary this work was to be carried out at the next scheduled inspection. Arrangements had been confirmed for the pilot to fly ZK-HOB to the engineering facility for the scheduled inspection on 14 December 1992 (the day following the accident).

2.28 The engine was subsequently stripped and examined at an approved overhaul organisation. No abnormality or defect was found which might have accounted for the latest in-service problems reported by the pilot. The magnetos were tested and operated satisfactorily. The number 4 cylinder, which had been considered suspect by the pilot, prior to the accident, was submitted to a specialist organisation for further examination. Detailed inspection and pressure testing disclosed no evidence of any defect which might have contributed to oil seepage or resulted in loss of engine performance.

2.29 While it was evident that problems had been experienced on previous occasions with the engine of ZK-HOB it was difficult to reconcile the pilot's recollection of events with the witness descriptions of the helicopter's sustained low level flight along the Kaniere-Kowhitirangi "straight". The considerable distance traversed by ZK-HOB while still airborne on an essentially south-east heading after colliding with the wires, was also difficult to relate to a low speed impact and the pilot's stated intention of following the driveway to land at the farm.

2.30 During the return flight the helicopter was carrying two passengers and had approximately 75 litres of fuel on board. At the operating weight of ZK-HOB, any substantial loss of engine power was likely to have obliged the pilot to make an immediate landing. In the event of a minor power loss, the pilot's options included continuing the flight at sufficient height to permit a successful auto-rotational landing should this have proved necessary, or initiating a reduced power approach to land with a minimum of delay on the nearest suitable area. These alternatives could have been expected to present fewer hazards than the pilot's decision, in the case of this accident, to descend the helicopter and fly for some distance at low level along a public road.

2.31 The pilot contended that he flew the helicopter above the road for a distance of about 200 m only, in order to reach an area of hard ground on which to put the helicopter down. Flying along the road was an option taken in case further power loss required the pilot to make an immediate 'run-on' landing. He stated that any traffic on the road would have been visible to all three occupants of ZK-HOB and his decision to try to reach the farmhouse was within his own, and the helicopter's, capabilities before the collision with the wires occurred.

3. FINDINGS

3.1 The pilot in command held a valid Commercial Pilot Licence (Helicopter) and Type Rating for the Hughes 269C type.

3.2 The helicopter's gross weight and centre of gravity were within the specified limits.

3.3 During a private flight the helicopter collided with a span of electrical supply wires.

3.4 The helicopter had descended to a low height before colliding with the wires.

3.5 The collision with the wires rendered the helicopter uncontrollable and it subsequently struck the ground.

3.6 The pilot reported that the descent was occasioned by a loss of engine power.

3.7 The recently installed engine had malfunctioned on some previous occasions.

3.8 Strip examination of the engine and specialist inspection of the number 4 cylinder failed to disclose evidence to account for a partial power loss.

3.9 No authority existed at the time of the accident for either the Police or Civil Aviation Authority Officers to request the pilot to undergo a breath test or to provide a blood sample to ascertain conclusively whether or not there was an alcohol involvement.

3.10 It was not possible to reconcile the evidence of the independent witnesses with the statements of the pilot.

4. RECOMMENDATIONS

4.1 A Recommendation was made to the Rules Rewrite Team, Civil Aviation Authority, that legislation be introduced to enable Police and Civil Aviation Authority personnel to require a pilot suspected to be under the influence of alcohol or drugs to undergo the appropriate test to determine if this was so.

4.2 A Recommendation was made to the Director, Civil Aviation, that action be taken to ensure that personnel concerned with the operation of Hughes or Schweizer 269 series helicopters are aware of the Flight Manual requirement for shoulder harness for the centre seat passenger and that the requirement be complied with.

24 June 1993

M F Dunphy
Chief Commissioner