

Pilot Flies R44 to Safety After Losing Tail Rotor

Richard Hayes of Southern Lakes Helicopters did some remarkable flying when he piloted his Raven II to a safe landing after the helicopter's tail rotor was destroyed.

Hayes was flying with doors off at about 4500 feet and 100 knots on a venison recovery operation in New Zealand's Fiordland National Park when something exited the helicopter and destroyed the tail rotor and tail rotor gear box.



Photo Credit: Hellicworks, New Zealand

Little remained of the tail rotor and tail rotor gear box following the accident.

Feeling a "thump" reverberate through the airframe, Hayes reduced airspeed to about 70-80 knots and tried the pedals to no effect. Still in control of the cyclic and collective and knowing he could steer the aircraft as long as he continued forward, Hayes decided to fly until he found a suitable place to land.

Located in the southwest corner of New Zealand's South Island, Fiordland National Park is a rugged land characterized by steep fiords, snow-capped mountains, unbroken forests, and lack of clear, flat areas.

The R44 was lightly loaded so it didn't require a lot of power and, more importantly, after the tail rotor's demise, the R44's empennage remained intact.



Photo Credit: Hellicworks, New Zealand

The R44 Raven II's tail rotor was destroyed, but the empennage remained intact.

The R44 features a large vertical stabilizer to equalize the torque of the main rotor and to help control the helicopter in the event of a tail rotor failure - the scenario Hayes faced. Without the empennage and tail rotor, the helicopter would have spun uncontrollably.

For 30 minutes Hayes nursed the crippled helicopter along, then about 10km east of Te Anau Aerodrome, Hayes saw an agricultural airstrip and decided to set the aircraft down. At 40 knots he executed a running landing, skidding 45 meters and stopping without injuring himself or further damaging the helicopter.

Coincidentally, the previous week Hayes conducted running landings under conditions simulating a tail rotor failure as part of the New Zealand CAA Annual Competency Check Ride. Check ride requirements prepare pilots for virtually any situation. This practice enabled Hayes to land the crippled helicopter safely and, until now, had resulted in Hayes having flown 25,000 hours without an accident.

Safety Tips for Doors-Off Flying

Before removing any doors for ventilation, pilots should review [Safety Notice 30](#) that strongly recommends pilots never fly with the left door(s) removed. Fatal accidents have occurred when an object has blown out the left door and struck the tail rotor.

When flying with doors off, especially the left door(s), take the following precautions

- **Always stow loose items securely within the cabin.** Many times the problem is caused by an object that becomes loose during the flight.
- **Preflight the person sitting in the left seat.** Make sure nothing (e.g., pens, pencils, glasses, etc.) is in the shirt pockets, and ensure cell phones and pagers are removed from waist belts.
- **Tell passengers to keep their heads and extremities within the helicopter's cabin.** Injuries can occur, particularly at high airspeeds.
- **When reinstalling doors, be sure to install the cotter pins in the door hinges.** Doors have come off in-flight due to missing pins.