ACCIDENT

Aircraft Type and Registration:	Robinson R22 Beta, G-FIRS
No & Type of Engines:	1 Lycoming O-360-J2A piston engine
Year of Manufacture:	1998
Date & Time (UTC):	16 January 2012 at 1305 hrs
Location:	Lake Vyrnwy, Powys
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (Minor) Passengers - 1 (Minor)
Nature of Damage:	Helicopter destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	30 years
Commander's Flying Experience:	61 hours (of which 50 were on type) Last 90 days - None Last 28 days - None
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquires by AAIB

Synopsis

In the final stages of an approach to a hotel helipad the pilot was unable to stop a right yaw, and the helicopter completed several rotations with decaying main rotor rpm before impacting the ground. The helicopter suffered severe damage and was largely consumed in a subsequent fire. The two occupants suffered minor injuries.

History of the flight

The pilot planned to fly from Kemble Airfield to a helicopter landing site adjacent to Lake Vrynwy in Wales. He had not flown for more than three months and was required to fly three solo circuits at Kemble before departing with his passenger for their destination. The pilot decided the weather was suitable for the intended flight with light surface winds and a probable wind for the route of 165° at 20 kt. Takeoff mass with full fuel and two occupants was calculated as 1,364 lbs, just below the maximum authorised mass of 1,370 lbs.

The pilot telephoned the instructor, who was not available at the airfield, concerning removal of the dual controls but the flight itself was not discussed. With departure thus delayed, and mindful of the need to complete the flight in daylight hours, the pilot departed directly with his passenger, having forgotten to carry out the three solo circuits.

The transit to Vrynwy was uneventful. A weather report obtained from Welshpool Airfield reported calm wind and a QNH of 1024 hPa. The landing site, in hilly terrain at about 1,000 ft amsl, was a marked helipad on a small grass field in the grounds of a hotel, which the pilot located without difficulty.

The pilot flew past the site about 1,000 ft above it on a left downwind leg, noting a windsock showing a south-easterly wind. He turned left onto final approach, establishing on what appeared to be a normal approach path, and set carburettor heat (which had been in use during the flight) to off. The pilot described approaching the site broadly into wind, with a gentle turn to the right in the later stages of the approach.

As the helicopter approached the landing site it started to yaw right. The pilot was unable to stop the yaw and the helicopter completed several full rotations. The pilot believed that he may have raised the collective lever further whilst rotating and recalled hearing the 'low rotor rpm' warning horn. Still rotating, the helicopter dropped and landed heavily on sloping ground. The right landing skid collapsed but the helicopter remained upright, allowing the pilot and his passenger to escape.

The helicopter had sustained severe damage but the engine was still running. Witnesses reported that it ran for several minutes before a fire broke out, consuming a large part of the structure. Both occupants were taken by air ambulance to hospital, where their injuries were found to consist mainly of cuts and bruises.

The pilot was unable to account for the loss of control. He believed that main rotor rpm had decayed significantly by the time the helicopter struck the ground.

Accident site information

Photographs of the accident site showed that the helicopter had struck the ground with little or no horizontal movement. The right skid had struck first, while it was pointing down a moderate slope, and had collapsed as the helicopter continued to rotate to the right, coming to rest facing approximately across the slope. There was evidence that the helicopter had rolled to the right on initial impact, with the rotor blades and the horizontal stabiliser making relatively light contact with the upward slope. The rotor blades appear to have been rotating but with low energy, the collective lever at, or very close to, the fully raised position. The Perspex transparencies had shattered and several large pieces were lying some distance from the wreckage.

Operating company's comments

The pilot booked the aircraft on a self-hire basis through an automated booking system. Because of his lack of currency, he would automatically have been reminded that he was required to complete three takeoffs and landings before departing on a flight carrying a passenger. The helicopter operator commented that pilots intending on self-fly hire would normally have their flight preparations overseen by an instructor. In this case, other duties took the available instructors away from the flight preparation area and an oversight in the operations diary had left them unaware of the intended flight.

The arrangements for self-fly hire were stated in the operator's flying order book and, on previous occasions, the pilot had arranged a refresher flight or discussed his intentions, but did not do so on this occasion. The operator subsequently reviewed its procedures and introduced additional measures to ensure that flying order book procedures were known and complied with.

Discussion

The loss of control occurred at low speed close to the landing site. As the helicopter slowed, there would have been an increasing power requirement, possibly rapid, as translational lift was lost. The cause of the initial right yaw is not certain but may have been aggravated by main rotor vortices blowing onto the tail rotor as the aircraft turned slightly right to approach the pad, placing the relative wind from forward and to the left of the helicopter. Equally, the pilot may have been slow to apply left yaw pedal as power was increased. Whatever the precise combination of factors, it is likely that the pilot's low overall experience level and lack of recency contributed to the loss of control.

Once the right yaw had started, an attempt to stop it with full opposite yaw pedal would have meant a significant extra power demand. Once the main rotor rpm started to fall, as evidenced by the warning horn, the amount of yaw the tail rotor was capable of producing would have reduced rapidly. Further main rotor rpm decay would have been hastened by application of 'up' collective lever and an increasingly rapid descent would have ensued, from which recovery would not have been possible.