ACCIDENT

Aircraft Type and Registration:	Robinson R22 Beta, G-ROUT
No & Type of Engines:	1 Lycoming O-320-B2C piston engine
Year of Manufacture:	1989
Date & Time (UTC):	22 January 2007 at 1015 hrs
Location:	Near Romiley, Stockport, Cheshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (Minor) Passengers - None
Nature of Damage:	Substantial
Commander's Licence:	Private Pilot's Licence
Commander's Age:	54 years
Commander's Flying Experience:	355 hours (of which 354 were on type) Last 90 days - 0.8 hours Last 28 days - 0.8 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

During an approach to a private landing site, the pilot brought the helicopter to a high hover with a strong tailwind. During the subsequent right turn to align the helicopter into wind, G-ROUT started descending and the pilot was unable to prevent the helicopter contacting a wooden fence and rolling onto its side.

Background to the flight

The passenger on the accident flight had flown G-ROUT from his private site near Romiley to another private site near Hawarden. It had been agreed that he would be taken back to the private site as a passenger in the helicopter. The pilot on the return flight had not previously operated a helicopter into the Romiley site but had been in there as a passenger. Dual controls were not fitted to the helicopter during the flights.

The landing site was in a paddock and bounded by a low wooden fence; the altitude of the site was 430 ft amsl. To the east of the landing site were open fields bounded by a row of trees and power lines orientated north/south. The preferred approach path was initially from the east and then turning to the south for the final approach. This procedure avoided built-up areas to the south and was convenient for the predominant surface wind from the west or southwest.

History of the flight

For the flight, the weather was good and the surface wind was reported as 030º/17 kt by Manchester ATC during the return transit. There was no windsock at the Romiley landing site. During the flight, the helicopter appeared fully serviceable.

The passenger provided advice to the pilot on the approach normally used and the pilot established a descent on a north-westerly direction over the power lines and trees to the east of the landing site. He then turned left onto a southerly direction and reduced airspeed until the helicopter was in a high hover at approximately 75 ft agl just to the east of the landing site. To maintain the hover, the pilot was using almost maximum permitted manifold pressure. He then commenced a slow right turn to align the helicopter into wind for the landing. This right turn was initially stable but the pilot was then aware that the helicopter was descending. He was conscious that the situation was conducive to a vortex ring condition but was also aware that the surrounding area limited his fly-away options. He lowered the collective lever with the aim of raising it again to cushion the landing. Close to the ground he raised the collective but the right skid contacted the top of a wooden fence and the helicopter toppled over onto its right side. The pilot turned off the fuel before exiting with his passenger through the left door.

Relevant information

The Robinson R22 Pilot's Operating Handbook included the following information:

1. *'Hover controllability has been substantiated in 17 knot wind from any direction up to 9,800 feet density altitude.'*
2. *'At 75 ft agl, the helicopter should be at a minimum airspeed of 52 kt to remain clear of the avoid area of the Height-Velocity diagram.'*
3. *'Never make takeoffs or landings downwind, especially at high altitude. The resulting loss of translational lift can cause the aircraft to settle into ground obstacles.'*
4. *'A vertical descent or steep approach downwind can result in "settling with power" (vortex ring condition). This happens when the rotor is settling in its own downwash and additional power won't stop the descent. Should this occur, reduce collective and lower the nose to increase airspeed. This can be very dangerous near the ground as the recovery results in a substantial loss of altitude.'*

LASORS Safety Sense 17 General Aviation *Helicopter Airmanship* provides advice on operating into private helicopter sites and on potential problems, and refers the reader to other relevant information on the British Helicopter Advisory Board (BHAB) web site www.bhab.org. It also includes information that conditions likely to result in vortex ring are: power on, low IAS (below 35 kt) and high rate of descent (over 300 ft per min).

Pilot's comments

The pilot assessed that it was likely that the helicopter entered a vortex ring situation and that the proximity of the fence meant that he had no chance of achieving a clear landing.

On reflection, with the unusual wind direction and its associated strength, the pilot considered that it would have been appropriate for him to carry out at least one overflight of the site to assess the situation and the preferred approach path before attempting a landing. He also thought that, with his lack of flying currency, he should have carried out some continuation training before landing at the site.