Robinson R22 Beta, G-BROX, 23 April 1996

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Aircraft Type and Registration: Robinson R22 Beta, G-BROX

No & Type of Engines:1 Lycoming O-320-B2C piston engine

Year of Manufacture:1989

Date & Time (UTC):23 April 1996 at 1650 hrs

Location: Greenham Common, Berkshire

Type of Flight: Private

Persons on Board: Crew - 1 Passengers - 1

Injuries: Crew - None Passengers - None

Nature of Damage: Heavy landing damage to skids and tail boom plus damaged mainrotor blade

Commander's Licence: Private Pilot's Licence

Commander's Age:42 years

Commander's Flying Experience:293 hours (of which 152 were on type)

Last 90 days - 38 hours

Last 28 days - 13 hours

Information Source: Aircraft Accident Report Form submitted by the pilot

The helicopter was returning on a southerly heading to a privatelanding site in Hampshire. The weather conditions were good visibilityoutside heavy rain showers and a westerly surface wind of 10 to15 kt. In the showers the visibility reduced to 5 km. The flightplan route passed close to the disused military airfield at GreenhamCommon and the pilot decided to overfly it so that his passengercould see the sights. As he approached the northern boundaryof the airfield the pilot checked for carburettor icing and notedthat the carburettor air temperature gauge indicated 15°C. However, there was a rain shower upwind of the airfield and soas a precaution he applied half travel on the carburettor heatcontrol and continued to monitor the air temperature gauge. Onreaching the western end of the airfield the aircraft encounteredrain and the aircraft started to climb. At that point the pilotapplied full carburettor heat and lowered the collective controlin order to regain his cruising altitude of 1,500 ft QNH. Shortlyafterwards, on an easterly heading, the aircraft encountered sinkwhilst descending in the region of the edge of the squall. Notingthat the carburettor air temperature was 20°C and that thehelicopter had lost some 500 ft of altitude, the

pilot returnedthe carburettor heat control to the cold position and increasedengine power to 24 in manifold pressure.

The unwanted descent was arrested at 800 ft QNH but shortly afterwardsat about 900 ft the pilot felt that the helicopter was unstableand the engine felt and sounded 'lumpy'. As he checked the engineinstruments the engine RPM decayed rapidly and so he lowered thecollective lever and opened the throttle but the engine did notrecover power. He then entered full autorotation, declared aMAYDAY and turned to the left to bring the helicopter into wind. Half way around this turn the aircraft entered a region of sinkingair on the edge of the squall and the descent rate increased. The pilot then re-evaluated his options and decided to turn backto the right and accept a forced landing, downwind, into a fieldof grass just beyond a construction site. He reduced airspeedto 40 kt in order to reach the field and applied full collectivejust prior to ground contact to cushion the landing. The helicopter'sground speed was high because of the tailwind and it bounced offthe ground and turned to the left. After the second touchdownthe aircraft slewed to the left and tipped to the right but thepilot was able to stop it rolling over with full left cyclic control. The engine was still running and the helicopter upright afterthe landing but the vertical impact forces bent the skid crosstubes and creased the tail boom. The damage to the trailing edgeof one main rotor blade was incurred during the landing but thecause was unexplained.

The 1550 hrs weather observation at nearby Farnborough recordedan air temperature of 10°C and a dew point of 7°C. These conditions are well inside the boundary for serious icingat any power setting according to the CAA's General Aviation Senseleaflet 3B. The main features of the carburettor icing probabilitydiagram are reproduced below.