No: 1/91 **Ref: EW/G90/09/15** **Category: 2c**

Aircraft Type and Registration:	Schweizer Model 300C, G-BREJ
No & Type of Engines:	1 Lycoming HIO-360-D1A piston engine
Year of Manufacture:	1989
Date and Time (UTC):	27 September 1990 at 2110 hrs
Location:	Oxford (Kidlington) Airport, Oxfordshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Tail rotor detached and damage to tail rotor gearbox
Commander's Licence:	Commercial Pilot's Licence (H) and Private Pilot's Licence (A) with Night rating
Commander's Age:	25 years
Commander's Total Flying Experience:	2,047 hours rotary wing (of which 110 were on type) and 90 hours fixed wing
Information Source:	Aircraft Accident Report Form submitted by the pilot

The pilot had just completed 1 hour 20 minutes of dual night flying and 1 hour 30 minutes solo. On final approach to the landing 'T' he noticed the cockpit lighting becoming progressively dimmer and after arrival at the 'T' he noticed that the landing light was becoming dimmer also. As the pilot was hover-taxiing back to dispersal he was advised by ATC to 'hold' for landing fixed-wing traffic: the pilot switched off the landing light to avoid dazzling the landing traffic and, as he switched the landing light on again, all the lights on the helicopter dimmed and extinguished in 2-3 seconds.

With no lighting at all the pilot decided to land immediately and seek advice. The helicopter touched down at a rearward speed the pilot estimated as 2-3 knots and the main skids dug in; the helicopter then tilted back, severing the tail rotor as it touched the ground. The helicopter rocked forward again and the pilot shut the engine down immediately.

The pilot commented that the tail assembly of the aircraft touched the gound with little apparent force and that the tail skid appeared to offer little protection to the tail rotor. In this design there is no ventral fin area and the tail skid is a simple curved tube attached, at the forward end only, to the tail boom and

extending slightly beyond the radius of the tail rotor. In this particular case the impact had only slightly bent the tube but this had still allowed the tail rotor to contact the ground.

Subsequent engineering examination showed that there was a faulty crimp at the connector on the alternator's field wire. Given that the helicopter had been operating for some 2 hours 50 minutes of night flying, the fault was consistent with intermittent charging of the battery.

At the time of the accident the helicopter was fitted with a simple ammeter to show the charging state of the battery. Since then the operator has fitted a 'low bus-bar voltage monitor' to all its helicopters of this type. In this system a red warning lamp in the cockpit is set to illuminate at a pre-determined voltage as the battery voltage falls following a malfunction of the alternator; the initial warning is by the lamp flashing and this becomes a steady light when the warning is 'accepted' by pressing the lamp. The warning automatically resets when the bus-bar voltage rises above the trigger level and the system incorporates a 'press-to-test' facility which functionally checks the monitor as well as the red light.