FINAL REPORT

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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 12 April 2004 appointed Mr. John Hughes as the Investigator-in-Charge to carry out a Field Investigation into this occurrence and prepare a Synoptic Report.

Aircraft Type and Registration:	Robinson R22 B2, EI-EHC
No. and Type of Engines:	1 x Lycoming O-360-J2A
Aircraft Serial Number:	3442
Year of Manufacture:	2003
Date and Time (UTC):	12 April 2004 @ 14.45hrs
Location:	Shannon Airport
Type of Flight:	Training
Persons on Board:	Crew - One Passengers - Nil
Injuries:	Crew - Nil Passengers - Nil
Nature of Damage:	Tail boom skin buckled.
Commander's Licence:	Student Pilot Licence
Commander's Details:	Male, aged 46 years
Commander's Flying Experience:	210 hours of which 54 were on type
Information Source:	Owner of EI-EHC

1. FACTUAL INFORMATION

1.1 History of the Flight

The student pilot was on his third cross-country flight. He departed Cork Airport and approached Shannon Airport from the South. The forecast wind for Shannon was 300º/5 kt. Enroute he estimated the wind at 1,000 ft to be 15 kt. He requested the use of runway (RWY) 31. The actual wind at Shannon was 320º/10 kt and the pilot approached RWY 31 and established an into-wind hover prior to the RWY 31/D1 taxiway intersection **(See Appendix A)**. He then proceeded to hover taxi along taxiway D1. During this time of cross wind taxiing he felt the aircraft was beginning to become a little unstable. To avoid turning out of wind he decided to hover-taxi past the exit of the light aircraft park. He landed in the grass east of the end of taxiway D1 adjacent to the light aircraft park. The student said that the landing was "*quite hard*," but did not think that the nose was high. The helicopter was now at a heading between 270º and 300º.

Following communication with the tower, he subsequently lifted the helicopter from this position, and continued to hover taxi to the right in a 4 o'clock direction to let down in the light aircraft park. He then shut down the helicopter and made a normal exit. Following inspection of the aircraft he discovered a small paint scratch at the lower end of the stinger and a crease in the tail boom on the starboard side of the tail just aft of the right hand mounting bolts **(See Appendix A)**.

1.2 Technical Information

A helicopter licensed engineer examined EI-EHC. He thought that in addition to the above damage the undercarriage seemed to be splayed slightly, particularly on the rear left hand side. There was a small crack in the pilot's door inside but this may not have occurred during this incident. He said that the slight paint chip on the stinger had been there at the last 50 hour inspection, which was carried out 5 hours previously. Heavy landing checks were later carried out at the owners premises. The tail rotor drive shaft was replaced as it was found out of limits during the inspection.

As required by the helicopter Maintenance Manual, the tailcone assembly was sent to the manufacturers for repair. The assembly was repaired, returned and re-installed by the owners

1.3 Pilot's Operating Handbook

Section 9 of the Pilots Operating Handbook for this type states *"Hover controllability has been substantiated in 17 knot wind from any direction up to 9,800 feet density altitude".*

2. ANALYSIS.

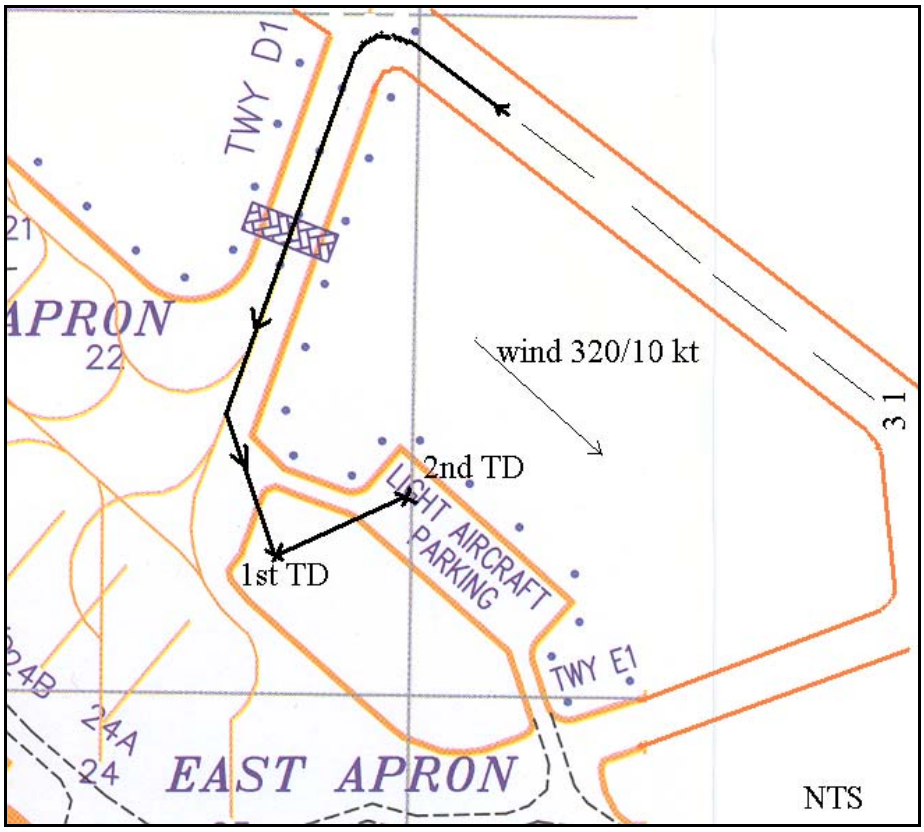
This helicopter is very popular as an ab initio trainer and there have been many cases where hover taxing near the ground, particularly out of wind, have resulted in damage to the helicopter.

The helicopter manufacturer's experience from other R22 hard landing accidents shows that the initial failure of the tailcone is due to compression buckling of the forward skin similar to this case. The compressive force acting at the tailcone 4 o'clock position (as viewed from the rear) was the resultant of a vertical downward force, caused by the momentum of the tail rotor assembly, and the lateral sideways trust of the tail rotor at the moment of touchdown.

The student made his approach to RWY 31 which was almost directly into wind. However, when he turned to hover taxi along D1, he then had a cross-wind of 10 kt with which he was uncomfortable. Moving downwind, the student decided to land on the grass, east of the end of taxiway D1, in order to avoid a direct down-wind track to the light aircraft park. It may have been more appropriate to make an earlier approach to the threshold of RWY 31, hover taxi into wind and manoeuvre sideways to the aircraft park.

This was a training incident. The report does not sustain any Safety Recommendations.

APPENDIX A



Buckling of the skin caused by compressive forces on the tailcone.
(i.e. the skin is pushed in)