

FINAL REPORT

AAIU Synoptic Report No: 2004-005

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In accordance with the provisions of S.I. 205 of 1997, the Chief Inspector of Accidents, on 24 April 2001 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:	Bell UH-IE N454CC
No. and Type of Engines:	One Lycoming T53 SER
Aircraft Serial Number:	155344
Year of Manufacture:	1967
Date and Time (UTC):	23 April 2001 at 18.55 hours
Location:	McKee Barracks, Dublin.
Type of Flight:	Private
Persons on Board:	One
Injuries:	None
Nature of Damage:	No damage
Commanders Licence:	Irish PPL(H) , UK PPL and US PPL(H) Piston & Turbine
Commanders Age:	39 years
Commanders Flying Experience:	1370 hours
Information Source:	Station Manager, ATC, Dublin

SYNOPSIS

The helicopter took off from a private helicopter pad adjacent to the West Link Bridge (on the M50 motorway) on a VFR flight to Howth, a distance of 16 miles across the city. The aircraft was exiting the Phoenix Park area at 1,000 ft. AMSL when the engine low oil pressure light came on. The pilot reduced collective pitch and made a precautionary landing on to the main square of an army barracks in the area.

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1. FACTUAL INFORMATION

1.1 **History of the Flight**

This single engined helicopter took off from a private helipad, adjacent to the West Link and river Liffey, at 18:50 hrs. The helicopter was on a VFR flight to Howth, which had been approved by Dublin ATC. The helicopter was cleared to the Phoenix Park and requested to “hold” over the park. The pilot did approximately eight small “low power circuits” while traffic was cleared from RWY 16 at Dublin Airport. The flight was then cleared to proceed to Howth at 1,000 ft. AMSL.

As the helicopter was exiting the Phoenix Park near Arus an Uachtarain, proceeding due East, the engine low oil pressure caution light illuminated. The pilot contacted ATC and informed them that he was going to land the aircraft. He then reduced the collective and the caution light extinguished. He performed a precautionary landing under power, on to a large tarmac square at McKee Barracks situated in the North city area. The pilot considered that this was a more secure landing site than a public park. There were no injuries or damage to the aircraft or to property.

1.1.1 **Air Traffic Control**

Air Traffic Services (ATS) compiled an Incident Report Form and stated:

“Wind 160/11kt, Visibility 10k, FEW 2800. Pilot reported letting down in Phoenix Park (car park of Mc Kee Barracks) with an engine problem (en route to Howth from West Link along the Liffey). Pilot said no services were required and he would arrange for maintenance.”

1.1.2 **Pilots Comments**

The pilot said that when the light illuminated he made a decision to divert to the secure landing site in the car park at Mc Kee Barracks as landing in the Phoenix Park would have created its own security problems if the helicopter had to remain there for several days.

1.2 **Fault Finding**

After the removal of some panels by the owner’s repair agency maintenance personnel it was noted that there was a crack in the engine oil return line to the oil tank at the firewall flange. This had released oil under pressure and a small quantity of oil was lost. The oil pipe was repaired by the maintenance personnel and the helicopter was released back into service two days later. Later, the complete tube assembly (Part No. 204-061-504-1) was replaced by a flexible one. The owners have now replaced all pipes forward and aft of the fireproof bulkhead.

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1.3 Aircraft History

The helicopter was manufactured in 1967 by the Bell Helicopter Company and designated the UH-1E. It was operated by the U.S. Navy in the Pacific and from 1973 to 1996 was in storage in Arizona. In 1996 it was used for fire-fighting in Montana, USA.

In 1997, a Special Airworthiness Certificate, under the Restricted Category of Civil Aircraft was issued by the USA Federal Aviation Administration (FAA). The registered owner is a U.S. citizen resident in America, and the pilot, who is an Irish citizen is co-owner of the aircraft.

1.4 Special Operating Limitations

In June 1997 the FAA certified this helicopter in the Restricted Category under the provisions of Part 21.25 for “special purpose operations”. The Flight Standards Office in Montana then issued Operating Limitations-Restricted (**Appendix A**). The Certificate of Airworthiness states that:

“Operating Limitations are part of this Certificate”

These limitations include the following:

“This aircraft has been certified in the Restricted Category under the provisions of FAR Part 21 as an Agriculture, Firefighting and External Load Operations per FAR Part 133. Operations involving this aircraft in any other use are prohibited”.

Para 3 of these Limitations states: *“the above limited operations shall not be conducted over densely populated areas, in congested airways or in the vicinity of busy airports where passenger transportation operations are being conducted unless the Administrator (FAA) finds it in the public interest to authorise such operation”.*

Para 6 states:

“When operated in the restricted category, this aircraft does not meet the requirements of the applicable, comprehensible and detailed airworthiness code as provided by Annex 8 to the Convention of International Civil Aviation. This aircraft may not be operated over any foreign country without the special permission of that country.”

However, Para 7 states:

“This aircraft shall be operated in compliance with the limitation prescribed in FAR 91.133 effective 3 June 1997 except brief operation over densely populated areas or in congested airways may be conducted during take-offs and landings necessary for refuelling only”.

FAR 91.133 imposes further considerable restrictions on the use of this helicopter (**Appendix B**). Para.(e) of these regulations states:

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Except when operating in accordance with the terms and conditions of a certificate of waiver or special operating limitations issued by the Administrator, no person may operate a restricted category aircraft within the United States –

(1) Over a densely populated area;

(2) In a congested airway; or

(3) Near a busy airport where passenger transport operations are conducted

The pilot informed the Investigation that he refuels from a 2,300 ltr mobile fuel bowser normally kept at his residence. He said that the bowser is regularly serviced and maintained by a major oil company. He replenishes the bowser at Dublin Airport when required.

1.5 Other information

An intended purpose of the FAA's Special Airworthiness Certificate programme was to facilitate the conversion of retired US military aircraft into civilian aircraft. In their military life such aircraft may have been operated beyond civil aviation design criteria, such as heavier weights, higher manoeuvring limitations etc. Therefore the FAA did not consider it to be appropriate to grant such ex-military aircraft and helicopters a normal unrestricted Certificate of Airworthiness. Typical employment for such aircraft are agricultural, fire-fighting and external load carrying operations.

FAR 21.25 above, is a Code of Federal Regulations which has been accepted by the IAA. At the time of the aircraft's arrival in this country the owner informed the IAA in accordance with the FAA issued "Operating Limitations". The FAA state that these limitations are part of the helicopter's issued Certification and are therefore applicable in Ireland.

2. ANALYSIS

2.1 The helicopter is now 34 years old and has been serviced and maintained in accordance with US Navy Navair Regulations, appertaining to component overhaul intervals and replacement times.

The Investigation found that the type of pipe fracture found at the bell-mouth was probably one due to fatigue. This could be due to a combination of age and the subjecting of the rigid metal pipe to prolonged engine vibration. The pipe was later replaced by a flexible hose. The owner has now replaced all pipes going to the bulkhead.

The pilot was told to hold while traffic was being cleared from RWY 16 at Dublin Airport. The helicopter at the time was operating close to a restricted zone at Aras an Uachtarain where civil aircraft may not descend below 1000 ft. AMSL. The pilot had filed a flight plan to cross a densely populated area and then towards the path of aircraft taking off from RWY 16 at Dublin Airport.

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In a written report to the Investigation, the pilot stated that having been cleared to Howth at a height of 1000 ft, he “*proceeded from the park at Aras An Uachtarain due East*” However, the flight plan was along the river Liffey. Heading East would have brought the helicopter over the built-up areas of Dublin 5, 9, 11, and 13. This would have resulted in a flight of more than 5 nm over a densely populated area. It may be that the pilot intended to turn south and follow the path of the River Liffey eastward through Dublin City. Even so, if the failure had been more serious, the choice of landing sites over the city would have been very limited. It should be noted that an alternative flight path was available which would have avoided flying over built up areas. This alternative would have been to route initially to the west, then flying north and east to clear Dublin airport, and hence to Howth. It is accepted that this routing would have been considerably longer than that actually planned, but it would have ensured compliance with the restrictions applicable to this helicopter. The Aeronautical Information Publication (AIP Ireland) includes the Visual Approach Chart for the Dublin Area and indicates the various VFR routes, holding patterns and reporting points. The “M50 Route” from the West Link to Howth would have been the appropriate route in this case.

While the US Regulation FAR 91 is not applicable in Irish airspace, in which the Irish Rules of the Air Order applies, it is the opinion of this Investigation that the planned flight did not comply with the “Special Operating Limitations” attached to the current Certificate of Airworthiness.

3 CONCLUSIONS

3.1 Findings

The oil pipe leading from the engine to the oil tank fractured at the fireproof bulkhead causing the loss of engine oil.

3.2 Causes

The oil pipe failed at the bell-mouth due to metal fatigue.

4. SAFETY RECOMMENDATIONS

4.1 This incident does not support a recommendation.

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APPENDIX A

FLIGHT STANDARDS DISTRICT OFFICE
FAA BUILDING, ROOM 3
HELENA REGIONAL AIRPORT
HELENA, MT 59601

OPERATING LIMITATIONS RESTRICTED

AIRCRAFT MAKE/MODEL: BELL/WILLIAMS HELICOPTER CORPORATION / UH-1E ^{So}

ENGINE MAKE: LYCOMING T53-L-13B

REGISTRATION NO: N454CC SERIAL NO. 155344

This aircraft has been certified in the restricted category under the provisions of FAR Part 21 as an Agriculture, Firefighting, and External Load Operations per FAR Part 133.

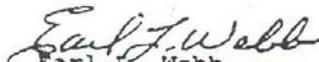
Operations involving this aircraft in any other use are prohibited unless the airworthiness certificate and this Operations Limitations sheet are amended in accordance with the provisions of FAR Part 21.

1. This aircraft shall not be operated in any manner which will endanger public life or property. The operator shall adjust the take-off weight to provide a safe margin of performance for the existing operating conditions, considering the takeoff area, altitude, temperature and terrain.
2. Maneuvers shall be limited to those normally performed in the above listed operations.
3. The above listed operations shall not be conducted over densely populated areas, in congested airways or in the vicinity of busy airports where passenger transport operations are being conducted unless the Administrator finds it in the public interest to authorize such operation.
4. Persons other than the minimum crew necessary for the above operations shall not be carried during these operations.
5. The spreading of sulfur or other inflammables is prohibited.
6. When operated in the restricted category, this aircraft does not meet the requirements of the applicable, comprehensible and detailed airworthiness code as provided by Annex 8 to the Convention of International Civil Aviation. This aircraft may not be operated over any foreign country without the special permission of that country.

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7. This aircraft shall be operated in compliance with the limitation prescribed in FAR 91.313 effective JUNE 3, 1997 except brief operation over densely populated areas or in congested airways may be conducted during takeoffs and landings necessary for refueling only.
8. These Operating Limitations are part of the Restricted Certificate of Airworthiness, FAA Form 8130-7, dated JUNE 3, 1997 and must be displayed in the aircraft in accordance with FAR 91.203(b).
9. For this aircraft to be operated with an external load, the operator must possess a current FAR 133 operating certificate.
10. This aircraft is prohibited from carrying cargo for compensation or hire. Carriage of cargo is limited to such cargo that is incidental to the aircraft owner/operator's business which is other than air transportation.
11. This rotorcraft must have the markings, placards, etc., required by Federal Aviation Regulation (FAR) 91.9 in addition to those described in restricted type certificate applicable to this rotorcraft.
12. This helicopter must be operated in accordance with the restricted category operating limitations of FAR 91.39 and with the limitations noted in U.S. Navy NAVAIR 01-110HCA-1F. This rotorcraft must be serviced and maintained in accordance with U.S. Navy NAVAIR 01-110HCA-2. Component overhaul intervals and replacement times shall be in accordance with U.S. Navy NAVAIR 01-110HCA-6 unless superceded by Airworthiness Directives.
13. Operator must comply with all appropriate notes in Williams Helicopter Corporation, Type Certificate Data Sheet #H780.
14. This rotorcraft shall be operated in accordance with applicable Air Traffic and general operating rules of FAR Part 91, and all additional limitations herein prescribed under the provisions of FAR 91.313.


Earl L. Webb
Principal Maintenance Inspector
NM-FSDO-05

June 3, 1997
Date Issued

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APPENDIX B

Section 91.313: Restricted category civil aircraft: Operating limitations.

- (a) No person may operate a restricted category civil aircraft --
- (1) For other than the special purpose for which it is certificated; or
 - (2) In an operation other than one necessary to accomplish the work activity directly associated with that special purpose.
- (b) For the purpose of paragraph (a) of this section, operating a restricted category civil aircraft to provide flight crewmember training in a special purpose operation for which the aircraft is certificated is considered to be an operation for that special purpose.
- (c) No person may operate a restricted category civil aircraft carrying persons or property for compensation or hire. For the purposes of this paragraph, a special purpose operation involving the carriage of persons or material necessary to accomplish that operation, such as crop dusting, seeding, spraying, and banner towing (including the carrying of required persons or material to the location of that operation), and operation for the purpose of providing flight crewmember training in a special purpose operation, are not considered to be the carriage of persons or property for compensation or hire.
- (d) No person may be carried on a restricted category civil aircraft unless that person --
- (1) Is a flight crewmember;
 - (2) Is a flight crewmember trainee;
 - (3) Performs an essential function in connection with a special purpose operation for which the aircraft is certificated; or
 - (4) Is necessary to accomplish the work activity directly associated with that special purpose.
- (e) Except when operating in accordance with the terms and conditions of a certificate of waiver or special operating limitations issued by the Administrator, no person may operate a restricted category civil aircraft within the United States --
- (1) Over a densely populated area;
 - (2) In a congested airway; or
 - (3) Near a busy airport where passenger transport operations are conducted.
- (f) This section does not apply to nonpassenger-carrying civil rotorcraft external-load operations conducted under part [133](#) of this chapter.
- (g) No person may operate a small restricted-category civil airplane manufactured after July 18, 1978, unless an approved shoulder harness is installed for each front seat. The shoulder harness must be designed to protect each occupant from serious head injury when the occupant experiences the ultimate inertia forces specified in [§23.561\(b\)\(2\)](#) of this chapter. The shoulder harness installation at each flight crewmember station must permit the crewmember, when seated and with the safety belt and shoulder harness fastened, to perform all functions necessary for flight operation.