



HELLENIC REPUBLIC
MINISTRY OF INFRASTRUCTURE AND TRANSPORT

**AIR ACCIDENT INVESTIGATION AND AVIATION
SAFETY BOARD**
(AAIASB)



ACCIDENT INVESTIGATION REPORT
INVOLVING HELICOPTER G-DKEM
IN THE FANARI AREA, MYKONOS
ON 4 MAY 2016

E 03 / 2017

**ACCIDENT INVESTIGATION REPORT
E 03 / 2017**

**Helicopter G-DKEM, BELL 407
at a private landing field in the Fanari area, Mykonos, on 4 May 2016**

The accident investigation was carried out by the Air Accident Investigation and Aviation Safety Board in accordance with:

- **Annex 13 to the Chicago Convention;**
- **Regulation (EU) No 996/2010;**
- **Hellenic Republic Law No 2912/2001.**

'In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and Law No 2912/2001, the purpose of investigations into aviation accidents and incidents is not to assign blame or liability. The sole purpose of the investigation and its findings is the prevention of accidents and incidents.

As a result, use of the findings for any purpose other than the prevention of future accidents could result in erroneous conclusions.'

The Air Accident Investigation and Aviation Safety Board

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TABLE OF CONTENTS

TABLE OF CONTENTS	III
SYNOPSIS	1
1 FACTUAL INFORMATION	2
1.1 History of the flight.....	2
1.2 Damage to aircraft	2
1.3 Personnel information	4
1.4 Aircraft information	4
1.5 Landing field details	5
1.6 Meteorological information.....	6
1.7 Regulatory framework for the helicopter landing site	7
2 ANALYSIS	8
3 CONCLUSIONS	8

OPERATOR: PRIVATE INDIVIDUAL
OWNER: TRUE COURSE HELICOPTERS
MANUFACTURER: BELL HELICOPTER TEXTRON
CANADA
MODEL: BELL 407
REGISTRATION: G-DKEM
NATIONALITY: British
TYPE: Helicopter
MANUFACTURER'S SERIAL NO: 53750
COUNTRY OF MANUFACTURE: Canada
ACCIDENT LOCATION: Fanari, Mykonos
DATE AND TIME: 4 May 2016, 13:20 h
NOTE: Times are local.
Local time = UTC +3 h.

SYNOPSIS

On 4 May 2016 at around 13:20 h, during take-off from a private helicopter landing field in Fanari, Mykonos, while hovering at a low altitude and turning into the prevailing wind, the tail skid of the private helicopter registered as G-DKEM, a Bell 407 operated by its owner and carrying four passengers, came into contact with an adjacent wall surrounding the field. After contact of tail section, the helicopter started to vibrate. The pilot safely landed the helicopter on the landing field.

The Air Accident Investigation and Aviation Safety Board was informed of the accident in an email from the Continuing Airworthiness Management Organisation (CAMO) and an investigation team was appointed.

As the country of registration, the United Kingdom's Air Accidents Investigation Branch (AAIB) was informed and appointed a non-travelling Accredited Representative.

1 FACTUAL INFORMATION

1.1 History of the flight

On 4 May 2016 at 13.20 local time, the private Bell 407 helicopter registered as G-DKEM took off from a private helicopter landing field belonging to the owner of the helicopter and located in Fanari, Mykonos, heading for Megara airport (LGMG). Prior to this it had submitted the flight plan by telephone at 12:38 h to the Mykonos airport control tower. According to the pilot's statement the weather was good, with very good visibility and south-westerly wind. The helicopter had five people on board (the pilot and four passengers) and 284 kg of fuel. The pilot reported that he conducted the pre-flight inspection without findings and followed the established before take-off procedures according to the pilot's handbook.

Before take-off, the helicopter was parked facing north because the prevailing wind was northerly when it landed on 28 April 2016. During take-off the helicopter initially hovered, then the pilot turned it to the left to take-off because the prevailing wind was south-westerly. While hovering, during the turn to the left, the pilot heard '*a bang, as if the helicopter came into contact with something*', and the helicopter subsequently experienced high vibration. The pilot continued turning, with continuous vibration and landed facing south (180° turn).

The persons on board of helicopter disembarked without difficulty and there were no injuries. The pilot then contacted the Mykonos airport control tower by telephone and closed the flight plan, without giving the reasons for not continuing with the flight.

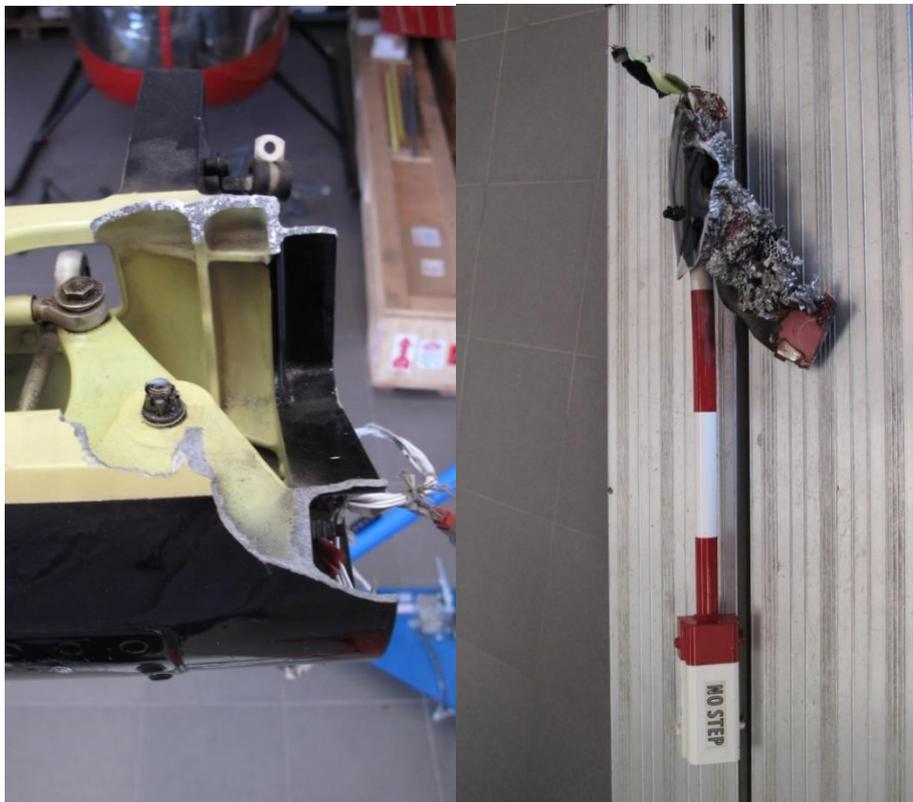
1.2 Damage to aircraft

Following the safe landing, the pilot carried out check which revealed that the tail skid and the lower part of the tail fin were missing from the helicopter, these were found at the rear of the adjacent wall. In addition, there was serious damage to the tips of the tail rotor blades, which showed traces of red. On the east side of helicopter landing field where there is a wall 1.6 m high, there were traces of contact (a red mark) with the tail section of the helicopter, approximately 10 cm below the top of the wall. The CAMO EL.MG.0034, responsible for its airworthiness, had the helicopter transferred by truck to the hangar of the maintenance organisation EL.145.0051, contracted for its maintenance, for further check.



Photo 1 – Tail fin

During the inspection, in addition to the aforementioned damage, the tail rotor gearbox support was found broken.



Photos 2 –3 Tail rotor gearbox support – Tail skid



Photo 4 – Tail rotor blades

Furthermore, a pin from the tail rotor blade had broken off and pierced the aerodynamic fairing of the cabin and the frame beneath the helicopter's tail section.

1.3 Personnel information

The pilot is a 65-year-old man with a PPL (H), No GR-004179, issued by the Hellenic Civil Aviation Authority on 14 August 2005 and expiring on 17 November 2016. He also has a Class 2 health certificate issued on 20 October 2015 and valid until 20 October 2016.

He has ten years flight experience with a total of 850 flight hours in helicopters, of which 500 flight hours were in a BELL 407.

His last flight prior to the accident took place on 28 April 2016, with destination the accident location.

He has good meteorological knowledge, having worked for two years at a weather station and he stated that he was in very good physical condition prior to the flight.

1.4 Aircraft information

Country of registration:	United Kingdom
Number of persons on board:	5 (pilot + 4 passengers)
Certificate of airworthiness:	issued on 1 July 2010
Airworthiness Review Certificate:	valid, expiring 22 May 2016
Helicopter's total flight hours:	838

Landings since manufacture: 1584

The operator has a contract with CAMO No EL.MG.0034 and is maintained in accordance with a maintenance programme approved by the UK Civil Aviation Authority.

In the helicopter's Technical Log Book there was no mention of any malfunction that would have affected the helicopter's manoeuvring ability and nothing about reported by the pilot.

1.5 Landing field details

The landing field is located on the north-west side of Mykonos, coordinates 37°29'16.96''N and 25°18'52.80''E, at an altitude of 144 m above sea level, in the Fanari area.

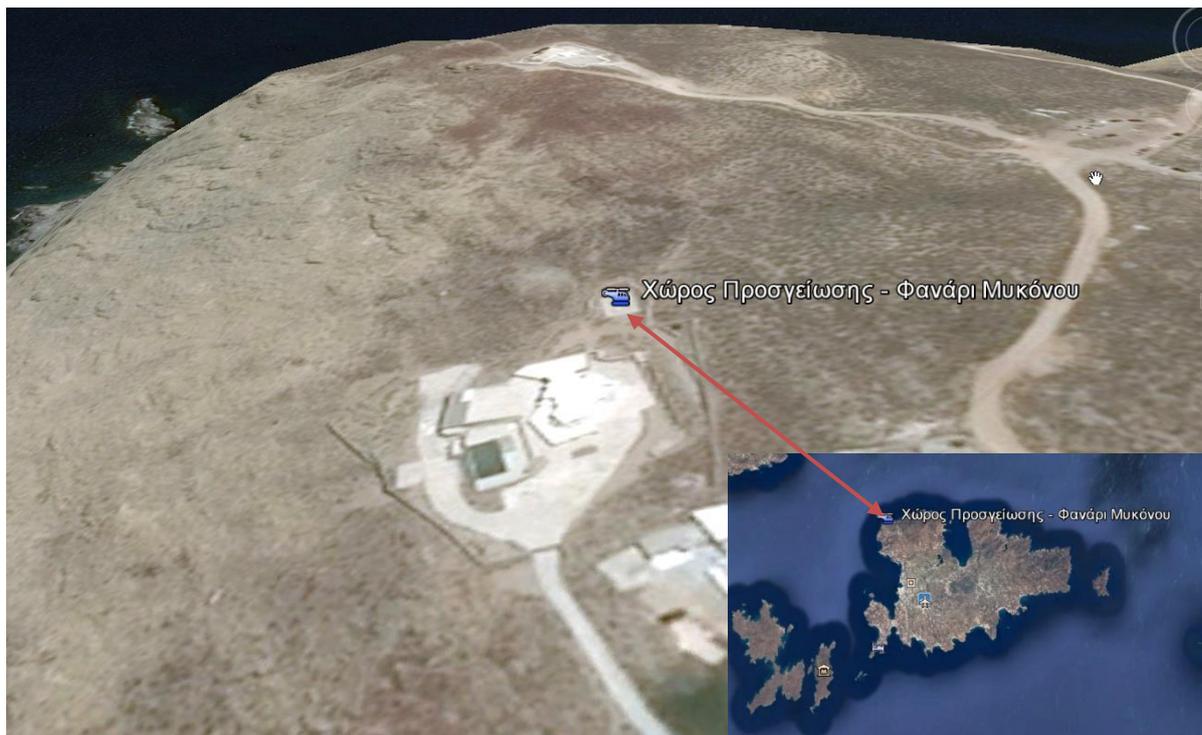


Figure 1 – Helicopter landing field, Fanari, Mykonos

The helicopter landing field is located on property owned by the helicopter pilot and owner and is surrounded by a wall on three sides. On the eastern side the wall is 1.6 m high and on the other two sides (northern and western), it is 0.5 m high.



Photo 5 Helicopter on parking area following the incident

The dimensions of the landing field used for helicopter take-off, landing and parking are 12 m x 10 m, with the longer side running north to south. The distance from the centre of the landing field to the eastern wall, where the tail skid came into collision, is 8 m and the distance of the western landing field edge from the eastern wall is 13m. A flag on a pole is used as a wind-direction indicator, located approximately 50 m from the landing field, in front of the owner's house.

1.6 Meteorological information

According to the pilot's statement, the prevailing wind at the time of the incident was south-westerly, that is consistent with the METAR data from LGMK, located 3.5 nm south-easterly of the helicopter landing field.

The METAR data at 10.20 h (13.20 local time) were as follows:

'METAR LGMK 041020Z 24010KT 9999 SCT018 SCT090 18/10 Q1007'

Wind from 240°, 10 kts, visibility over 10 km, cloud coverage SCT with cloud bases at 1800 ft and 9000 ft, temperature 18°C with dew point 10°C and barometric pressure QNH 1007 hPa.

The pilot, in his initial notification statement about the accident, mentioned the presence of gust wind while the h/c was hovering at about 2 m above the helipad and while he was trying to turn it against the prevailing wind.

Also, due to the location of the landing field and its surrounding orography, prevailing winds from northeast to the southwest direction may give gust winds.

1.7 Regulatory framework for the helicopter landing site

The regulatory framework governing the use of helicopter landing fields is Article 12 of Presidential Decree No 19/2009 on the establishment, construction, equipment, operation and exploitation of helipads (Government Gazette, Series I, No 35, 3.3.2009).

In particular, paragraph 2 states:

'2. The helicopter pilot is responsible for the flight operation of the helicopter at landing fields, has full responsibility for the suitability of the landing field, and must consider the suitability of the area while in the air.

In these procedures the following in particular must be taken into account:

- a) whether the landing field is of sufficient size and durability;*
- b) the position and height of any obstacles in the approach and take-off areas and in the vicinity of the landing area;*
- c) whether the surface of the landing field is clear, to prevent dust, sand or other loose material from being thrown up;*
- d) the flight operation limitations of the helicopter ... '.*

2 ANALYSIS

According to the pilot's statement, there was no any helicopter' defect and no evidence of any malfunction with the flight controls that could affect the helicopter's manoeuvring.

The helicopter's loading was within the manufacturer's prescribed weight and balance limits.

The location of the landing field is 144 m above sea level just in the top of the high slope hill and the prevailing weather conditions, wind coming from 240°, 10 kts together with the area's orography, there is a possibility of presence of gust wind.

The length of the helicopter is 10.4 m, while the distance of the eastern wall that was hit by the tail fin and rotor is 8 m from the centre of the landing field (designated area). From these dimensions it appears that the available space for rotary movement of the h/c is limited, namely if the centre of the h/c is rotated round by its axis accurately it leaves an available distance of about 2.8 m (8 m – 5.2 m) from the side wall. So if the operator of the h/c does not swing accurately and at a height that clears the surrounding obstacles (wall) the probability of hitting them is almost certain.

Consequently, taking into account the above i.e. the limited space available for rotary motion of the h/c and the possibility of wind gusts due to the location of the take-off area, it is clear that if the pilot fails to pay due attention to the obstacles surrounding the take-off area in order to bring the helicopter to a safe hover height above the surrounding wall and before performing the turn to the left, it is possible for the helicopter's tail section to collide with the 1.6 m high wall at the eastern edge of the take-off field.

From the subsequent inspection of the helicopter and the existing photographic material, it becomes clear that on contact of the tail skid with the wall, the lower part of the tail fin became skewed and then, as it touched the tail rotor blades where there are traces of red, the lower section of the tail fin was cut off. The contact between the tail rotor blades and the tail skid resulted in the tail rotor gearbox support breaking. This led to the vibration reported by the pilot.

3 CONCLUSIONS

The pilot and the helicopter met the regulatory requirements for the flight.

The helicopter landing field, used for helicopter take-off, landing and parking, is owned by the pilot and very familiar to him, as he has taken off from and landed there a great many times.

The landing field is located 144 m above sea level and the prevailing weather conditions together with the area's orography mean that wind gusts are possible.

The human factor can be considered as a cause of the accident as follows:

- The field was very familiar to the operator.
- Insufficient care was taken with the obstacles surrounding the landing field, so as to ensure that while the helicopter was hovering before carrying out the turn to the left, the flight height was adequate for clearing obstacles such as the wall at the eastern side of the landing field.
- No consideration was given to the possibility that there could be wind gusts while hovering.

Helliniko, 16 / 06 / 2017

CHAIRMAN

Athanasios Binis

Exact Copy

The Secretary

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