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AIRCRAFT ACCIDENT INVESTIGATION
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NAMIBIA

Enquiries: T.H.Herman **Our Ref: 3/48** **Date:03 June** 2015

To : Honorable Minister: Works and Transport

From : Director: Aircraft Accident Investigation

RE: AIRCRAFT INCIDENT REPORT

Please find attached the final report on the above subject incident. In accordance with the International Civil Aviation Organization Annex 13 – Aircraft Accident and Incident Investigation – Standard 6.13, final reports shall be published as soon as possible in the interest of accident prevention.

It is recommended that copies of these final reports be made available to the public and other interested parties upon request. Your approval is therefore sought to release the said reports.

Ericksson M. Nengola 11/06/2015
Ericksson M. Nengola
DIRECTOR: AIRCRAFT ACCIDENT INVESTIGATION

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FOREWORD

This Report presents the factual information, data analysis, conclusions, and safety recommendations reached during the investigation. The purpose of the investigation was to establish the circumstances surrounding this accident.

In accordance with the provisions of Annex 13 to the Convention on International Civil Aviation Organization, the accident's analysis, conclusions, and safety recommendations contained therein are intended neither to apportion blame nor to single out any individual or group of individuals. The main objective was to identify the systematic deficiencies and draw lessons, from this occurrence, which might help to prevent accidents and/or incidents in the future. To this end, many a time, the reader may be interested in whether or not an issue was a direct cause of the accident (that has already taken place), whereas the investigator is mainly concerned with the prevention of future accidents/incidents.

As a result, usage of this report for any purpose other than (the latter and spirit of Annex 13 and other relevant statutes) prevention of similar occurrences in the future might lead to erroneous interpretations and applications.

ABBREVIATIION

CPL	-	Commercial Pilot License Helicopter
AGL	-	Above Ground Level
UTC	-	Universal Time Co-ordinate
MPI	-	Mandatory Periodic Inspection
NAMCARS	-	Namibia Civil Aviation Regulations
FDR	-	Flight Data Recorder
CVR	-	Cockpit Voice Recorder
ICAO	-	International Civil Aviation Organization
C of A	-	Certificate of Airworthiness
C of R	-	Certificate of registration
MHZ	-	Megahertz
AMO	-	Aircraft Maintenance Organization

Ministry of Works and Transport

ACCID/09272012/01-8

DIRECTORATE OF AIRCRAFT ACCIDENT INVESTIGATIONS
ACCIDENT REPORT – EXECUTIVE SUMMARY

Aircraft Registration	V5-HTZ	**Date of Accident**	27 September 2012	**Time of Accident**	15:00 UTC
Type of Aircraft	BELL LONG RANGER	**Type of Operation**		AerialSurvey/observation flight	
Pilot-In-Command License Type	CPL Helicopter	**Age**	49	**License Valid**	Yes
Pilot-In-Command Flying Experience	Total Flying Hours	8402.8 hrs		Hours on Type	123 hrs
Last point of departure	Henties Bay				
Next point of intended landing	Walvis Bay				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)					
10 NM north of Walvis Bay airport					
Meteorological Information	Wind: SW, Wind speed: 15knots, Visibility: ≥10 Km, Temperature: 25°C Cloud cover: Clear, Cloud base: Nil, Dew point: Not known				
Number of people on board	1 + 2	**No. of people injured**	0	**No. of people killed**	0

Synopsis

According to the pilot, the aircraft departed Henties Bay to Walvis (FYWB) Bay after completion of aerial film work with a pilot and two passengers on board. The accident was reported to the Directorate of Aircraft Accident Investigation by the pilot through a phone call. The investigation was organized and conducted by the Directorate of Aircraft Accident Investigation in the Ministry of Works and Transport. There was no accredited representative invited to take part in the investigation. The accident aircraft together with the engine were transported to South Africa for further investigation. The final report was signed and released by the Minister of Works and Transport.

After takeoff from Henties Bay to Walvis Bay with two passengers and around 400 pounds of fuel which translate to (222.2 liters) on board the aircraft routed straight to Walvis Bay. When the aircraft was two (2) miles south of Swakopmund the right booster warning light came on. He looked at the fuel pressure which he found sufficient and the fuel gauge was still showing 300 pounds (166.6 liters). The pilot continued flying to Walvis Bay and at 11 miles in bound Walvis Bay Airport he descended the aircraft from 1000 feet AGL to 500 feet AGL and called Walvis Bay tower but there was no respond. The aircraft experience a light turbulence and the engine started surging. After the engine surged about three (3) times it shut down and the engine out warning light came on. After the engine shut down the pilot immediately lowered the collective stick control to execute an autorotation and maintained a good main rotor R.P.M and speed of about ± 60 knots .After he landed the aircraft safe on the ground, the main rotor struck the tail boom cutting off the rear section of the tail boom.

The weather was fine with good visibility.

The pilot was a holder of a Commercial Pilot License. His medical certificate was valid with no restrictions. The aircraft type was endorsed in his license.

The last annual Inspection was certified on 12 April 2012 at 9595.3 airframe hours by AMO NO. 040-1 with the Namibian AMO approval number #018 issued on the 12th September 2011 which was extended for a further three (3) months after it got expired on the11 September 2012 to the new issued and expire date of 11th September 2012 till 11December 2012. The AMO approval was again extended for nine (9) months to the new issued and expire date of 11 December 2012 to the 11th September 2013.

At the time of accident the aircraft had accumulated a further 95 airframe hours since the last annual inspection was certified.

Probable Cause
Engine failure
CONTRIBUTING FACTOR Fuel contamination

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator	: Namibia Helicopter Services
Manufacturer	: Bell Helicopters
Model	: 1985
Nationality	: Namibian
Registration Marks	: V5-HTZ
Place	: Walvis Bay
Date	: 27 September 2012
Time	: 15:00 UTC

All times given in this report is Co-ordinated Universal Time (UTC).

Disclaimer:

This report is given without prejudice to the rights of the Directorate of Aircraft Accident Investigations, which are reserved.

Purpose of the Investigation:

In terms of the Aviation Act (act No 74 of 1962) and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to apportion blame or establish legal liability****.*

This report contains fact relating to aircraft accidents or incidents which have been determined at the time of issue. The report may therefore be revised should new and substantive facts be made available to the investigator(s).

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 According to the pilot, the aircraft departed Henties Bay to Walvis Bay after completion of an aerial film work with a pilot and two passengers on board. The pilot further stated that when the Aircraft was at two (2) miles after Swakopmund the right booster warning light came on.

1.1.2 The pilot looked at the fuel pressure which was sufficient and he also looked at the fuel gauge which indicated over 300 pounds (166.6 liters) of fuel on board the aircraft. That information made the pilot decide to continue flying to Walvis Bay.

1.1.3 The pilot further told the investigator that he continue to fly to Walvis Bay (FYWB) with the wind coming from south westerly with a speed of about 15 knots, good visibility, temperature of about 25°C,and clear cloud cover. With 11 miles inbound to Walvis Bay he descended the aircraft from 1000 feet AGL to 500 feet AGL and called Walvis Bay tower but there was no respond.

1.1.4 The aircraft had a light turbulence and the engine started surging. The engine surge about 3 times and then shut down, the engine out warning light came on. The pilot said he immediately lowered the collective control stick put the aircraft in autorotation and maintained a good main rotor R.P.M and speed of ± 60 knots.

1.1.5 The aircraft landed safe on the ground however, the main rotor blade struck the tail boom rear section cutting it off completely from the aircraft. There were no injuries to the passengers and the pilot.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0
None	0	0	0	0

1.3 Damage to Aircraft

1.3.1 The aircraft was substantially damage.

1.4 Other Damage

1.4.1 There were no other damages to property or the environment.

1.5 Personnel Information

Nationality		Namibian			
Licence No	CR 0053	Gender	Male	Age	49
Licence valid		Yes	Type Endorsed	Yes	
Ratings		Game/livestock cull			
Medical Expiry Date		15 February 2013			
Restrictions		None			
Previous Accidents		None			

Flying Experience:

Total Hours	8402.8
Total Past 90 Days	73.2
Total on Type Past 90 Days	27.6
Total on Type	123

1.6 Aircraft Information

Airframe:

Type	Bell 206 Long Ranger	
Manufacturer	Bell Helicopters	
Aircraft Serial Number	51150.	
Year of Manufacture	1985	
Total Airframe Hours (At time of accident)	9690.3 Hrs	
Last Annual Inspection (Date & Hours)	12 June 2012	9595.3 Hrs
Hours since Last Annual Inspection	95 Hrs	
C of A (Issue Date)	25 March 2011	
C of A (Expiry Date)	02 May 2013	
C of R (Issue Date) (Present owner)	25 March 2011	
Operating Categories	Standard A, B,F Restricted B,C,D,G,H	

Engine:

Type	Roll Royce
Engine Serial Number	CAE895320
Hours since New	10142.9 Hrs
Hours since Overhaul	Nil

Fuel

The aircraft uses Jet A-1 fuel and according to the pilot the aircraft was refuelled at various refuelling point in the last 30 days prior to the accident. Several refuelling were done from non sealed refilled drums.

Meteorological Information

1.17 The following weather information was obtained from the pilot's questionnaire.

Wind direction	South westerly	Wind Speed	15knots	Visibility	10Km
Temperature	25°C	Cloud cover	Clear	Cloud base	Nil
Dew point	Not known				

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard Navigation Aids applicable for this type.

1.9 Communications.

1.9.1 The pilot was transmitting on 122.5 MHz frequency but he did not get a respond from Walvis Bay tower when he contacted them 25 miles inbound.

1.10 Aerodrome Information

1.10.1 The accident happened in the desert approximately 10 nautical miles north of Walvis Bay airport.

1.11 Flight Recorders

1.11.1 The aircraft was not equipped with Flight Data Recorders (FDR) or Cockpit Voice Recorder (CVR)
nor was it required by the regulation for this type of aircraft.

1.12 Wreckage and Impact Information

1.12.1 The aircraft was substantially damage. The main transmission system was found damaged and the tail boom rear end section was cut off completely by the main rotor blade. The parts from the tail boom were scattered in a radius of about 30 metres from the helicopter.

Figure 1. A photo showing the aircraft where it landed and the damage to the tail boom section

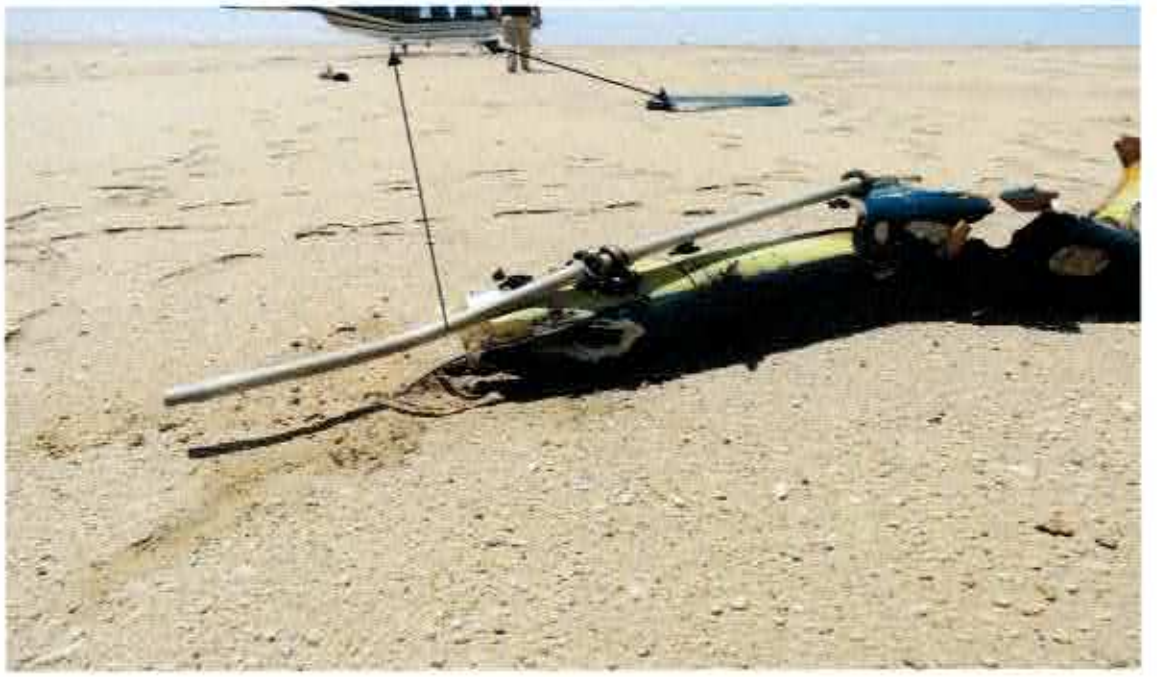

Figure 2. This photo shows scattered parts from the tail boom section at a radius of about 30 meters away from the helicopter and most of the parts were found on the right hand side of the helicopter when looking from the rear into the direction where the helicopter is nose facing that is also the direction of rotation of the main rotor blade which is counter clock wise when looking at the rotation of the blade from the top of the rotor mast.

1.13 Medical and Pathological Information

1.13.1 The pilot was a holder of a commercial Pilot Licence. His Medical Certificate was valid at the time of accident. Toxicology was not carried out on the pilot.

1.14 Fire

1.14.1 There was no pre or post impact fire.

1.15 Survival Aspects

1.15.1 Due to a well executed autorotation and landing there was no impact force during landing which made the accident survivable. The pilot and his passengers were securely strapped in with the aircraft safety harnesses.

1.16 Tests and Research.

1.16.1 The aircraft engine was thoroughly tested at different setting on a test cell facility at National Airways Corporation (NAC) in South Africa and there was no discrepancies noted.

1.17 Organizational and Management Information

1.17.1 This was a private flight after completion of aerial film work.

1.17.2 The aircraft was registered to Namibia Helicopter Services.

1.17.3 Both Certificates (C of A and C of R) were valid at the time of the accident.

1.17.4 The last Mandatory Periodic Inspection (MPI) was carried out by AMO NO. 040-1 and it has been maintained in accordance with the approved maintenance schedule.

1.18 Additional Information

1.18.1 None

1.19 Useful or Effective Investigation Techniques

1.19.1 None

2. ANALYSIS

2.2.1 The pilot and two (2) passengers were on a return flight from Henties Bay to Walvis Bay after completion of aerial work.

2.2.2 The flight from Henties Bay to Walvis Bay was approximately 35 minutes.

2.2.3 The wind was coming from south westerly direction with speed 15 knots, visibility of ≥ 10 km, temperature 25°c and clear cloud cover during the accident.

2.2.4 Five minutes before the accident the right booster pump warning light came on however the pilot continued flying.

2.2.5 At approximately ten (10) miles to Walvis Bay the engine surge three (3) times and shut down in flight.

2.2.6 After the engine shut down in flight the pilot executed an autorotation for landing however after a safe landing the main rotor blade struck the tail boom rear end section cutting it off completely.

2.2.7 There was 300 pounds (166.6 litres) of fuel on board the aircraft after the accident and that fuel was enough for the remaining of the flight to Walvis Bay Airport which was around 10 miles from the accident site. However there was a concern of how the aircraft has been refuelled because the investigation found that sometimes the aircraft was refuelled from unsealed refilled drums which can cause fuel contamination. Refuelling from non sealed refilled drums that are being transported over distances and refilled several times experience shows that fuel becomes contaminated from the moisture and this causes the coating inside the drums to peel off and contaminate the fuel.

2.2.8 The last Mandatory Periodic Inspection (MPI) was carried out on the 12th April 2012 by AMO NO. 040-1 with the Namibian AMO approval number #018 issued on the 12th September 2011 which was extended for a further three (3) months after it got expired on the11 September 2012 to the new issued and expire date of 11th September 2012 till 11December 2012. The AMO approval was again extended for nine (9) months to the new issued and expire date of 11 December 2012 to the 11th
September 2013.

3 CONCLUSION

3.1 Findings

3.1.1 The pilot's licence was valid at the time of the accident.

3.1.2 The pilot's medical certificate was valid.

3.1.3 The aircraft's Certificate of Airworthiness (C of A) and Certificate of Registration (C of R) were valid at the time of the accident.

3.1.4 The pilot and two passengers were on a return flight from Henties Bay to Walvis Bay after completion of aerial film work.

3.1.5 The weather was fine with good visibility at the time of the accident and will not be considered as a factor contributing to the accident.

3.1.7 Weight and balance was not considered to be a factor to this accident as it was within the prescribed limit.

3.1.8 After the inspection on the fuel system was done by NAC in South Africa there was contamination
in the form of debris found in the fuel system.

Figure: 3 the two pictures shows clearly the fuel contamination found during the investigation.

3.2 Probable Cause/s

3.2.1 Engine failure.

3.3 Contributory Factors

3.3.1 Fuel contamination

4. SAFETY RECOMMENDATIONS

4.1 None

Compiled by:

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T.H.Herman
Investigator-in-charge

Date: 04/06/2015

Released by:

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Alpheus G. !Naruseb, MP
MINISTER: MINISTRY OF WORKS AND TRANSPORT

Ministry of Works and Transport
Date: 10 JUN 2015
Office of the MINISTER