بسم الله الرحمن الرحيم

ACCIDENT INVESTIGATION COORDINATING COMMITTEE

AIRCRAFT ACCIDENT REPORT 2020/01

PRELIMINARY REPORT ON INVESTIGATION OF THE ACCIDENT OCCURRED ON VIKING AIR DHC-6-300, 8Q-MBC AIRCRAFT AT KUREDHU WATER AERODROME, MALDIVES

on 24th February 2020

INTRODUCTION

Maldives is a signatory to the Convention on International Civil Aviation (Chicago, 1944) which established the principles and arrangements for the safe and orderly development of international air transport. Article 26 of the Convention obligates Signatories to investigate accidents to civil aircraft occurring in their State.

This report is based upon the investigation carried out by the Accident Investigation Coordinating Committee (AICC) in accordance with Annex 13 to the Convention, the Civil Aviation Act 2/2001 and the Civil Aviation Regulations. The sole objective of this investigation is to prevent accidents and serious incidents. It is not the purpose of this investigation to apportion blame or liability as envisaged in Annex 13 to the Convention.

The AICC was assisted by Maldives Civil Aviation Authority (CAA), and Trans Maldivian Airways.

All timings in this report are in local time unless otherwise stated. Time difference between local and UTC is +5 hours.

The report is released on 22 July 2020.

Mr. Abdul Razzak Idris
Chairperson
Accident Investigation Coordinating Committee

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LIST OF ABBREVIATIONS

AICC : Accident Investigation Coordinating Committee

COM : Communication

CNS : Communication, Navigation and Surveillance

CVR : Cockpit Voice Recorder

DHC-6-300 : Viking Air Twin Otter 300 Series

ELT : Emergency Locator Transmitter

FDR : Flight Data Recorder

FO : First Officer

IFDS : Integrated Flight Deck System

Lbs. : Pounds

LT : Local time

MCAA : Maldives Civil Aviation Authority

MCAR : Maldives Civil Aviation Regulations

MLE : Male'

MNDF : Maldives National Defence Force

MPS : Maldives Police Service

MRI : Magnetic Resonance Imaging

NM : Nautical Mile

OEM : Original Equipment Manufacturer

PF : Pilot Flying

PNF : Pilot Not Flying

PIC : Pilot-in-command

PIREP : Pilot Reports

RWY : Runway

SOP : Standard operating Procedure

STC : Supplemental Type Certificate

TAT : Total Air Time

TAC : Total Air Cycles

TBA : To be advised

TBD : To be determined

TMA : Trans Maldivian Airways Pvt. Ltd.

UTC : Universal Coordinated Time

VFR : Visual Flight Rules

VHF : Very High Frequency

VMC : Visual Meteorological Conditions

VRMM : Velana International Airport

SYNOPSIS

On 24th February 2020, DHC6-300 aircraft, registration 8Q-MBC owned and operated by Trans Maldivian Airways Pvt. Ltd., was on a charter flight from Velana International Airport outbound to Kuredhu Island Resort. The flight was conducted in accordance with the Visual Flight Rules (VFR). There were fifteen passengers, two pilots and one cabin crew onboard the aircraft. The accident occurred during landing on the water aerodrome at Kuredhu Island Resort.

At the time of the accident the water aerodrome was experiencing squally winds and rough seas under sunny conditions, common during the north east monsoon, though atypical to the time of the year.

The aircraft, while landing on one of the designated (but unmarked) water runways, touched down and bounced. After the bounce, while the aircraft was still airborne, the aircraft banked to the left dipping the left wing-tip into the water and the aircraft veered to the left. The right wing of the aircraft then abruptly dropped. The PIC attempted to to intiate a go around after the bounce without success.

During the accident the fuselage, wings, engines and propellers of the aircraft sustained substantial damage. Both the floats were intact and the aircraft was upright after the event. The aircraft was moved and tied to the buoys with the assistance of the left engine and a dingy.

All passengers and crew were able to evacuate, safely. However, as a direct consequence of the accident, two of the operating crew and one passenger suffered minor injuries.

The accident occurred at 1135 hours. CAA reported the accident to the Accident Investigation Coordination Committee (AICC) at 1202 hours on the same day. One investigator from CAA representing AICC arrived at the accident scene, approximately at 1300 hours. The investigation commenced, forthwith. Two other investigators, (one each from CAA and AICC) arrived at the accident site at around 1715 hours on the same day and continued their investigation efforts gathering data, interviewing crew, passengers, and available witnesses.

1. FACTUAL INFORMATION

Aircraft Owner:	Trans Maldivian Airways Pvt Ltd.
Registered owner:	Trans Maldivian Airways Pvt Ltd.
Operator:	Trans Maldivian Airways Pvt Ltd. (Air Operator Certificate No.005)
Aircraft Type:	Viking Air (De Havilland) DHC-6-300
Nationality:	8Q (Republic of Maldives)
Registration:	8Q-MBC
Aircraft Manufacturer:	De Havilland Canada (Type Certificate owned by Viking Air Ltd.)
Manufacturers Serial No.:	256
Place of Accident:	Kuredhu Island Resort Latitude: 05° 32.90N Longitude: 73° 27.89E
Date and Time:	24 February 2020 at 1135 hours

1.1 History of Flight

1.1.1 Background

On the day of the accident both the pilots reported for duty at 0600 hours at TMA base. Both the PIC and the FO was on 0510 hrs bus from HulhuMale' and it was the first day back in duty after the three days off. It was the first time ever, that both the pilots were paired to fly together. Neither appropriate introductions of the flight crew were made, nor crew briefings took place before the flight.

The first flight of the day was Male'-Lily Beach-Male' and the the second flight was Male'-InnaHuraa-Atmosphere-Male'. The accident flight was the third flight - the sixth leg of the day. All the flights of the day were uneventful up to the affected accident flight.

The crew reported not receiving any weather update for Kuredhu, but was aware of other flights operating to Kuredhu.

The company issued a "flight release" for both sectors MLE / KUR and KUR / MLE for flight number FLT692600 – issued at 10:14 hrs on the same day. The airline "flight release" document contains three parts - the operational flight plan, passenger manifest and the luggage list – documenting weights for luggage and hand luggage. The operational flight plan is signed by both the Flight dispatcher and the PIC. A Mass & Balance report for the flight

was also issued at 10:44 hrs - shortly before the flight departure. This Mass and Balance report is computed by the PIC, using a tablet in the cockpit and is prepared using the data stated in the flight release document. There is no provision for PIC's signature for acceptance of the Mass & Balance report, and is available on a tablet. The Mass and Balance data is uploaded on company network in real time as the tablet is connected to Operator's network using wi-fi data network at main base, and at other stations it is connected to company network using mobile data. If mobile data is not available at a point of depature, the mass and balance data does not get uploaded in the company network until mobile data becomes available.

The aircraft was released for flight on the previous night and there were no record of any deferred defects.

The crew began the day by preparing the aircraft for flight. Water was pumped out of the floats and the number of strokes required to empty the floats were recorded in the "float status report form". Company procedures require to check the float serviceability status at the start and end of each day. The co-pilot pumped the right float while the cabin crew pumped the left float. According to the crew, the number of pump strokes to empty the water from the floats were within the limits specified in the company procedures. The crew carried out the pre-flight and walk-around checks prior to the first flight of the day. No abnormalities were recorded or reported by the crew.

The roundtrip flight, Male'-Kuredhu-Male' was released with 3 crew members (2 flight crew and 1 cabin crew) and 15 passengers from Male' to Kuredhu. As per the flight release document, the aircraft was loaded with 434 lbs of baggage and 785 lbs of fuel, with a take-off mass of 12,495.58 lbs.

The FO was PF for this sector of the flight. Taxi-out, take-off, cruise and until the approach to Kuredhu, the flight was normal and uneventful. Cruising altitude was 6500 feet and the winds were easterly, and the sea conditions were found to be rough. During approach, at about 100 to 150 feet the PIC noticed the speed was low and instructed the FO to correct the speed. The FO responded by correcting the speed. The FO reported noticing an altimeter difference of 20 to 40 feet between the altimeters. The FO also reported noticing a difference of 2 to 3 knots on the ASIs.

According to the flight crew, no abnormalities were observed throughout the flight.

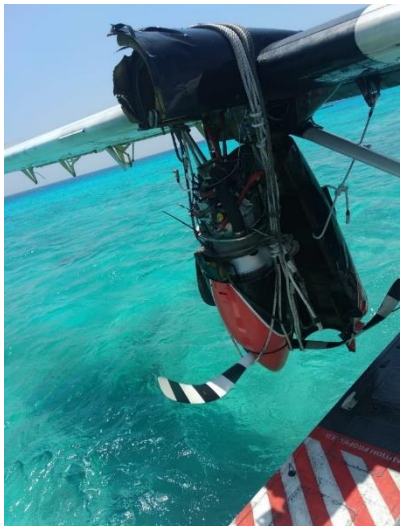

Figure 1: Aircraft engine detached from all three mounts after the accident

Descent began 15 mins prior to landing at Kuredhu, and the FO gave the briefing and descent checks were carried out. The FO requested the PIC to 'standby for the line' and when the Kuredhu was visible, the FO also infomed the PIC that this will be "Right base for north east bound landing". The FO reported seeing white caps and the waters were choppy but was confident of landing in such rough waters, as having done similar landings even the week before. The FO communicated the line to the PIC and stated "in case of go-around we will climb to 500 feet as per the SOP". The PIC advised the FO to keep the aircraft slightly t the left, closer to the reef, just on the lighter blue area, as it was believed that this area was relatively calmer. The FO reported that around 400 feet FO called out for full flap and max rpm, and repeated for a second time "that in case of ground we will climb to 500 feet as per the SOP" and FO stated that there was no obstruction.

The PIC confirmed landing just outside the lagoon and about 10 degrees into the wind. Landing inside appeared to be more risky to the PIC, due to number of obstructions including boats and buoys, and the landing outside the lagoon was believed to be safer. No circle overhead was carried out due to not realizing the rough conditons.

Figure 2: RH engine inboard mount

The aircraft, while landing touched down and bounced, which appeared to be manageable, according to both the flight crew. As soon as the aircraft bounced the FO was advised by the PIC to add power for a go-around. At the same time FO heard the fire alarm. As power was added after the bounce, the aircraft banked to the left with the left wing tip dipping into the water and veering the aircraft to the left.

Once the aircraft bounced, the PIC attempted to intiate a go-around by adding power but the speed bled off and there was a simulataneous left wing drop. The FO tried to level off the aircraft but reported controls extremely heavy.

Immediately after the dip, the PIC attempted to shut down the right engine as the fire bell was continuously ringing, but could not move the fuel levers as it was jammed, and as a

precautionary measure subsequently activated the fire extinguisher bottles, and then switched off the fuel shutoff valves and also shut-off the right engine boost pump. The PIC instructed the FO to visually check for a fire in right engine, to which the FO confirmed there was no visible fire, but smoke emanating due to engine exhaust.

The FO recalled continuously checking outside checking for the float damages as usually float damages are associated with heavy landings.

The FO after seeking approval from the PIC, started to follow the evacuation procedure and with the assistance of the cabin crew instructed and assisted the passengers to remove the seat belts. Next passengers were instructed to remove the life jackets from under the seat and all passengers were made to wear the life jackets but was instructed not to inflate the life jackets. The passengers were told to wait for the boat.

FO reported calling the TMA dispatch three or four times and reported an accident and requested for help. A jetski (water scooter) and a speedboat arrived but the jetski declined to tow the aircraft as jetski would not have the capacity to tow the aircraft.

Using the operable left engine and controlling the aircraft using the left engine power lever the PIC attempted to maintain the aircraft. After about 15 minutes the resort dinghy arrived and helped the aircraft to be secured to the buoy.

Once the aircraft was secured the left engine was shut down, the passengers disembarked and baggage was offloaded, after which the crew went to the resort.

1.1.2 Aircraft:

The aircraft (MSN: 256) manufactured by De Havilland, Canada (presently supported by Viking Air Ltd) was rolled out from the production line in September 1969. It had previously been operated under different registrations with a few other operators until registered in the Maldives in 2010 under registration 8Q-MBC, for operation with Maldivian Air Taxi, a company later bought over by Trans Maldivian Airways Pvt Ltd.

1.1.3 Flight crew:

The flight was operated by three crew members. All had valid licences granted by CAA, Maldives. Review of the records confirm that the medicals, seaplane ratings, and proficiency checks of the pilots were current, as of the date on which the accident occurred. Both pilots

held Commercial Pilot Licences. Details including hours accrued on type are specifiec in para 1.5 of this report.

1.2 Injury to persons

Injuries	Crew	Passengers	Total in the aircraft	others
Fatal	0	0	0	NIL
Serious	0	0	0	NIL
Minor	2	1	3	NIL
None	1	14	15	NIL
Total	**3**	**15**	**18**	**NIL**

1.3 Damages to aircraft:

Survey of the wreckage by accident investigators identified the extent of the damages caused to the airframe, wing, engines and propellers. The damages include but not limited to:

1. Right Hand Wing:
   a. Various damages were observed on wing in the area between ribs 25 to rib 28
   b. The leading edge bottom skin of ribs 26, 27 and 28 found buckled upwards
   c. Wing tip torn in several places
   d. Wing fin dislocated with the leading edge shifted inboard
   e. The inboard trailing flap skin were found buckled upward

2. Left Hand Wing:
   a. Wing tip found damaged
   b. Wing tip Leading Edge (LE) buckled and bent downwards and aft
   c. LH aileron (outer most) found twisted and bent upward

3. Right Hand engine:
   a. Right Hand engine found fully detached from the mount/nacelle, hanging only by the fuel hoses and fuel control rods connected to it
   b. One of the vibration isolators (inboard) found sheared off
   c. Nacelle structure to which the vibration isolators (outboard and top) were ripped off
   d. RH engine propeller blades (all three of them) were found bent aft. Red paint scratch marks found on one of the blades
   e. Nicks observed on all three blades

f. Bottom engine cowling skin ruptured at several places, and attachment rivets were found sheared off

4. Floats:
    a. LH float tip was found damaged

5. Airframe:
    a. LH Hydraulic bay panel was found twisted and forward top corner bent outwards
    b. RH hydraulic bay panel was found twisted and bent outward from bottom aft corner
    c. Control columns movement partially restricted
    d. RH fuel control jammed

1.4 Other damage

There were no damages to any other property or objects.

1.5 Personnel information

1.5.1 Pilot-In-Command

Age:	31 years
Nationality:	Indian
Gender:	Male
Type of License:	Commercial Pilot License
License issued on:	26.05.2019
License expires on:	25.05.2024
Type of medical:	Class 1
Medical issued on:	17.02.2019
Medical expires on:	16.03.2020
Types flown:	DHC-6 (on Maldivian license)
Hours on type:	2,774.5 hours
Ratings:	DHC-6, Float Plane
Last Proficiency check:	22.01.2020 (OPC), 29.07.2019 (LPC)
Total hours as PIC:	2,849 hours
Total flight time:	4,436.3 hours

1.5.2 Co-pilot

Age:	31 years
Nationality:	Maldivian
Gender:	Male
Type of License:	Commercial Pilot License
License issued on:	18.05.2018
License expires on:	17.05.2023
Type of medical:	Class 1
Medical issued on:	28.02.2019
Medical expires on:	16.03.2020
Types flown:	DHC-6
Hours on type:	768 hours
Ratings:	DHC-6, Float Plane
Last Proficiency check:	19.11.2019 (OPC), 15.05.2019 (LPC)
Total flight time:	1,007 hours

1.5.3 Cabin Crew

Age:	23 years
Nationality:	Maldivian
Gender:	Male
Type of License:	Cabin Crew License
License issued on:	21.07.2019
License expires on:	20.07.2024
Type of medical:	Cabin crew
Medical issued on:	30.05.2019
Medical expires on:	30.05.2021

1.6 Aircraft information

1.6.1 General information

The DHC-6-300 “Twin Otter” is an unpressurised, all-metal, high wing aircraft powered by two Pratt & Whitney PT6A-27 engines driving Hartzell three-blade, reversible-pitch, full feathering propellers. The aircraft is designed for seating two pilots, side by side with dual controls and standard flight instrumentation.

Manufacturer:	Viking Air Pvt Ltd (De Havilland)
Registration:	8Q-MBC
Powerplants:	PT6A-27
Manufacturer's Serial Number (MSN):	256
Year of construction:	1969
Total Air Time and Landing at time of accident:	50,640.48 hours and 88,358 landings
Certificate of Airworthiness:	Normal category, issued on 20 Jan. 2010
Airworthiness Review Certificate:	Issued on 20 January 2019 - later extended until 19 January 2021
Last periodic inspection	EMMA No 17 on 29 Jan 2020
Last inspection carried out at TAT	50,533.17 hrs

1.6.2 Engines and Propellers

Right Engine (Gas Generator)	
Right engine manufacturer	PWC
Year of manufacture	UNKNOWN
Model	PT6A-27
Serial number	PCE-52061
Total Hours since new	15,567.70
Last overhaul date	30-Jan-20
Hours since overhaul	55.85
Last check carried out	Fuel Nozzle Replacement & Borescope Inspection on 18-Feb-2020
Hours since last check	30.79
Right Engine (Power Section)	
Right engine manufacturer	PWC
Year of manufacture	UNKNOWN
Model	PT6A-27PS
Serial number	25279-100
Last overhaul date	30-Jan-20
Hours since overhaul:	55.85
Last check carried out:	Overhauled on 30-Jan-2020
Hours since last check:	55.85

Left Engine (Gas Generator)	
Left engine manufacturer:	PWC
Year of manufacture:	UNKNOWN
Model:	PT6A-27
Serial number:	PC-E41260
Total Hours since new:	21,449.17
Last overhaul date:	26-Jun-17
Hours since overhaul:	3,498.15
Last check carried out:	EMMA#17 dated 29-Jan-2020
Hours since last check::	107.31
Left Engine (Power Section)	
Left engine manufacturer::	PWC
Year of manufacture:	UNKNOWN
Model:	PT6A-27PS
Serial number:	41260-100
Last overhaul date:	26-Jun-17
Hours since overhaul:	3,498.15
Last check carried out:	EMMA#17 dated 29-Jan-2020
Hours since last check:	107.31
Right Propeller	
Manufacturer:	HARTZELL
Year of manufacture :	UNKNOWN
Model:	HC-B3TN-3DY
Serial number:	BUA21393
Last overhaul date:	26-Jul-19
Hours since last overhaul:	746.29
Last check carried out:	EMMA#17 dated 29-Jan-2020
Left Propeller	
Manufacturer:	HARTZELL
Year of manufacture:	UNKNOWN
Model:	HC-B3TN-3DY
Serial number:	BUA24398
Last overhaul date:	18-Dec-19
Hours since last overhaul:	159.2
Last check carried out:	EMMA#17 dated 29-Jan-2020

1.6.3 Cabin Layout and Configuration

Cabin was configured under a LOPA approved by an EASA approved Design Organization to carry fifteen passengers plus one cabin crew in a standard floatplane configuration in which the seat normally installed in the sixth-row position is removed for carriage of passenger luggage in the cabin rather than carrying them in the dedicated cargo compartments. The reason being that the forward cargo compartment is not accessible for loading the luggage while the aft cargo compartment is not large enough to accommodate all the luggages normally carried by fifteen passengers. The aft baggage compartment is only used for loading smaller luggage.

The aircraft was in float configuration with Wipaire 13000 floats installed. The aircraft had four exits in the cabin and two exits in the cockpit. In this configuration the right passenger door is approved to be blocked.

1.6.4 Recent maintenance

The most recent maintenance inspections carried out include: Equalized Maintenance for Maximum Availability (EMMA) number 17 complied with on 29th Jan 2020, at 50,533.17 TAT and 88,093 TAC. During this EMMA inspection, the engine top mount was replaced with a new unit and several other engine and propeller related tasks were carried out.

1.6.5 Flight Controls

Only those inspectons called for in the EMMA inspection were carried out on the flight controls. Neither maintenance nor operating crew reported abnormalities on the flight controls.

1.6.6 Powerplants

The maintenance records confirm that the engine installed on right hand position was replaced on 12th February 2020, as troubleshooting action on a pilot report (Pirep) which stated that the reverse spooling takes more than 8 seconds. As a concurrent requirement, propeller dynamic balancing was carried out on 16th February, 2020. No spooling defects were reported thereafter.

1.6.7 Fuel

Jet A-1 fuel was used on the aircraft. The aircraft had a total of 785 lbs. of fuel at departure from MLE, as per the Mass & Balance Report filed with TMA by the dispatchers.

1.6.8 Accessories

None

1.6.9 Defects

From the documents surveyed, the aircraft had no open defects.

1.6.10 Aircraft load

The aircraft has a total weight of 12,500 pounds, as Maximum Take-off Weight (MTOW). When it was dispatched from MLE for sector MLE-KUR, the aircraft had a total weight of 12,496 lbs., as per load sheet computed and available at the base.

Pax List (passenger list) - Flight Release document completed and printed at 10:36:08 by TMA Flight Dispatchers (available in MLE) confirm that:

- Passenger weight (15 passengers) weighed a total of 2,523 lbs.;
- Luggage (17 pieces) weighed a total of 500 lbs.;
- Hand luggage (14 pieces) weighed 91 lbs.

This translates to a total payload of 3,114 lbs. carried onboard the aircraft, at departure from MLE.

1.6.11 Load sheet

The load sheet also served as the passenger manifest. A copy of the load sheet was retained with dispatch prior to taking-off, as required per the company Operations Manual. No discrepancies are evident in loading the aircraft from the results of the investigation carried out.

1.7 Meteorological information

No weather data was available at Kuredhu water aerodrome.

CAA Air Safety Circular ASC14-2 Amendment 1, Procedure and requirements for licensing water aerodromes and floating platforms, dated 04 February 2009, requires one wind direction indicator to be mounted on the movement area. No such visual aid was available at Kuredhu water aerodrome at the time of the accident.

Meteorological information available from the automatic weather station at Lhaviyani Olhuvelifushi island, located 34km south-east of Kuredhu water aerodrome, available at 1100 hours, was:

Pressure: 1011 hectopascals
Rain fall: 0
Wind velocity (average): 080° at 15 mph (13.03 knots)
Wind velocity (maximum): 070° at 26 mph (22.59 knots)

1.8 Aids to navigation

The aircraft was operating under VFR where no navigational aids were required.

1.9 Communications

There were no communication problems or system anomalies throughout the flight from taxi to take-off to cruise to landing.

1.10 Aerodrome information

Destination Aerodrome:	Kuredhu Island Resort, Lhaviyani Atoll
Reference	5° 32.90'N 73° 27.89'E
Facilities:	2 fixed platforms and 4 mooring buoys

Location of the water aerodrome, including 4 water runways available at Kuredhu is shown on the aerodrome chart, published by TMA.

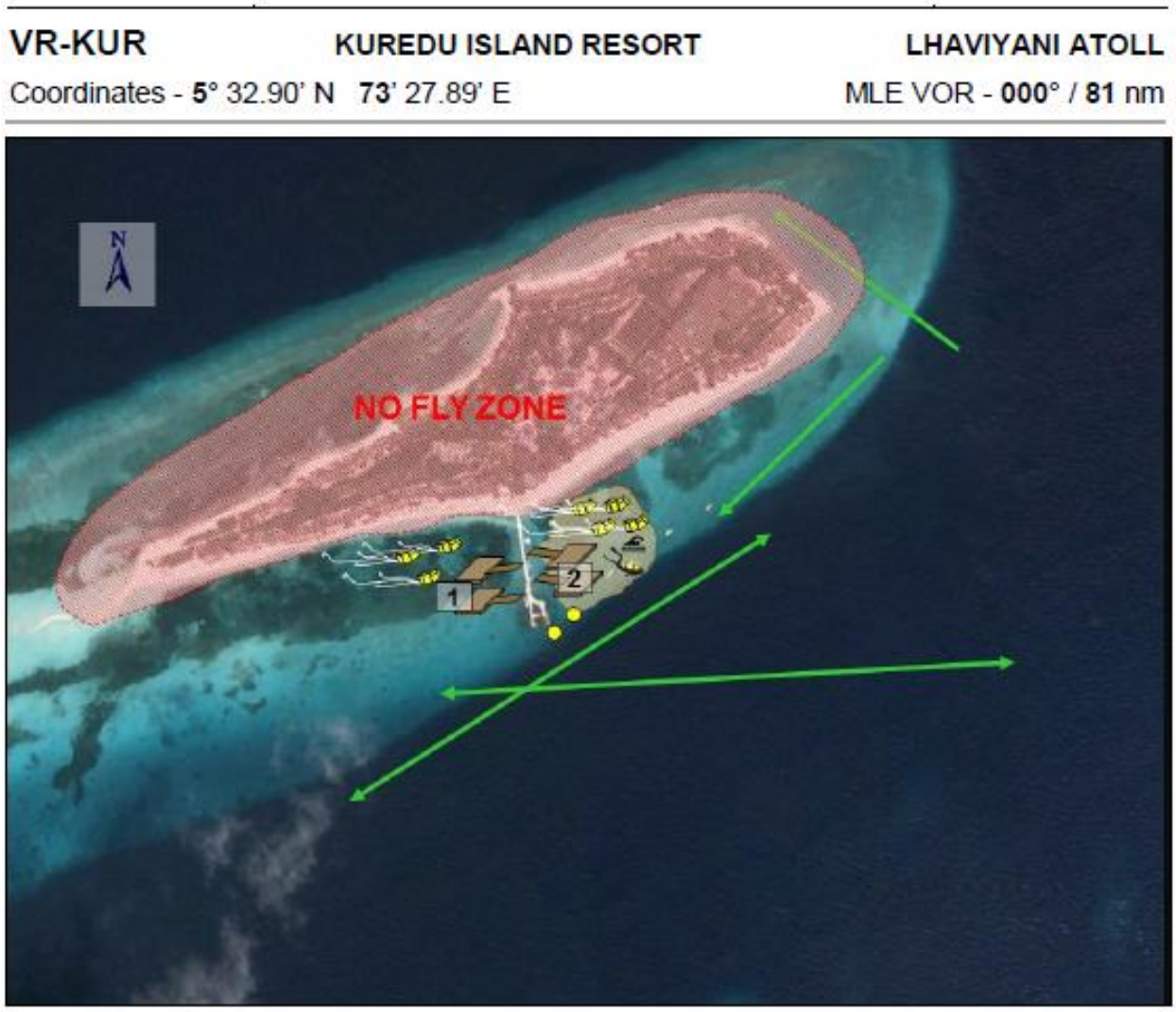

Figure *1*

Aerodrome License bearing license number AP/PR/23 (for Private use) was initially issued on 31 January 1996, to Kuredu Holdings Limited by the then Department of Civil Aviation.

1.11 Flight Recorders

Flight recorders are not requirement by MCAR. No flight data recorder (FDR) or cockpit voice recorder (CVR) was installed on the aircraft as Maldivian Civil Aviation Regulations permit operation of the DHC6, series 100/200/300 (legacy) aircraft without them.

1.12 Wreckage and impact information

1.12.1 Accident site visit

Accident site was visited by investigators from both CAA and AICC.

1.12.2 Wreckage Condition

For impact information refer to 1.3.

1.12.3 Salvage operations

The wreckage was loaded on to a flat top barge, using a crane and was transported and offloaded at VIA. Secondary damage to the wreckage was very minimal.

1.13 Medical and pathological information

Both flight crew members and the cabin crew were subjected to drug tests and the results were reported negative for all crew.

1.14 Fire

At the time of impacting the water, crew reported that a fire alarm sounded from the RH engine. The co pilot visually checked the RH engine area for any fires and none could be observed. The PIC did operate the fire shutoff handle and the indicator cartridge suggests the fire bottle was discharged.

Subsequent visual inspections carried out by the crew did not reveal any signs of fires.

1.15 Survival Aspect

Having the aircraft stabilized the copilot proceeded to the cabin and worked along with the cabin crew to check on the welfare of the passengers. They made sure that the passengers had donned their life jackets, while they themselves put on their own life jackets. The PIC called dispatch and advised the Dispatchers on the situation and requested them to call Kuredhu to provide them with a dingy so that parking of the aircraft at the buoy can be accomplished. A dingy was deployed from the resort that assisted the crew taxi the aircraft to the buoy and secure the aircraft. All passengers were then evacuated, safely.

All seats and seatbelts were intact.

There were no evidences of an activated ELT.

1.16 Tests and research

Since it is not common for vibration isolators to sheer in the way it did, Engine vibration isolator assemblies installed on the right-hand engine, at the time of the accident require metallurgy tests to determine the cause of the failure.

These isolators undergo periodic eddy current inspections as called for in Airworthiness Directive No. CAD/2005/01R1 dated 08 April 2007, issued by CAA Maldives. The AD states that past service experience has indicated that Engine Vibration Isolator failures occur occasionally during landing at rough water conditions.

1.17 Organizational and Management Information

Trans Maldivian Airways Pvt. Ltd (TMA) is a Maldives Civil Aviation Authority (CAA) approved Air Operator Certificate holder. TMA provides domestic air services with the aircraft fleet of over 57 DHC-6 on floats. The company is authorized to conduct day VFR Operations.

Regular inspections and periodical flight checks were conducted on the operation and crew respectively by CAA to verify compliance and competency. The company also holds Aircraft Maintenance Organization Approval (MCAR-145) and annual audits are carried out by the CAA, in addition to random spot checks and regular Airworthiness Review Inspection of TMA fleet.

1.18 Additional Information

None.

1.19 Useful or Effective Investigation Techniques

None.

2. INITIAL FINDINGS

Based on the information gathered during the course of the investigation, the facts listed below have been determined:

- The aircraft had a valid certificate of airworthiness;
- The crew had valid licenses and qualifications to conduct the flight;
- The aircraft was subjected to abnormal force during landing.

- The Engine vibration isolator assemblies installed on the right-hand engine which failed during the landing had previously undergone eddy current inspections as called for in the Maldives CAA Airworhtiness Directive. The mount has sufficient hours left for next inspection;
- As per the operator, normally SD cards are installed in all the aircrafts. However, the SD card which normally capture the operating data on Garmin G950 system was found missing;
- The weather condition at KUR water aerodrome was unknown prior to departure of the aircraft from main base MLE.
- Poor coordination between the PIC and FO and misjusdgment of the pilot flying.
- No Pre flight briefing
- CAA Air Safety Circular ASC14-2 Amendment 1, Procedure and requirements for licensing water aerodromes and floating platforms, dated 04 February 2009, requires one wind direction indicator to be mounted on the movement area, but none was available.

3. SAFETY RECOMMENDATIONS:

- Since fracture of the engine mounts had occurred on several other DHC6 aircraft in the past, it is recommended that sheared mount undergo metallurgical test alongwith one other serviceable engine mounts belonging to the same batch available with the operator;
- Since the aircraft is installed with Garmin 950 avionics suit under STC and the system is capable of recording several parameters normally captured on a FDR, it is recommended that CAA Maldives establish procedures to prevent loss of the data card installed on the display;
- It should be noted that the AICC in its recommendations following several previous accident investigations, has recommended CAA to re-examine the criteria for carriage of flight recorders on transport category aircraft, certified to carry more than 9 passengers, with a view to requiring all aircraft to carry at least a CVR. It is therefore recommended MCAA consider previous recommendations by AICC.