



ACCIDENT INVESTIGATION COORDINATING COMMITTEE

Republic of Maldives

SAFETY INVESTIGATION REPORT 2023/01/P

PRELIMINARY REPORT

**INVESTIGATION OF THE ACCIDENT AT VOMMULI WATER AERODROME
INVOLVING VIKING AIR DHC-6-300 AIRCRAFT, 8Q-TAQ OPERATED BY
TRANS MALDIVIAN AIRWAYS (TMA)**

on

16 May 2023

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 and serious incidents 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.

In investigating this accident, AICC was assisted by Trans Maldivian Airways (TMA).

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

The report is released on 15 June 2023



Mr. Abdul Razzak Idris

Chairperson

Accident Investigation Coordinating Committee



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LIST OF ABBREVIATIONS

AICC	Accident Investigation Coordinating Committee
ATL	Aircraft Technical Log
CAMO	Continuous Airworthiness Management Organisation
CG	Centre of Gravity
CVR	Cockpit Voice Recorder
DHC-6-300	Viking Air DHC-6, series 300 aircraft
EMMA	Equalized Maintenance for Maximum availability
FDR	Flight Data Recorder
FO	First Officer
TMA	Trans Maldivian Airways
lbs.	Pounds
LT	Local Time
LH	Left Hand
MCAA	Maldives Civil Aviation Authority
MCAR	Maldives Civil Aviation Regulations
MLE	IATA designated three letter code for Velana International Airport
MMS	Maldives Meteorological Service
MSN	Manufacturer Serial Number
MTOM	Maximum Take-Off Mass
PF	Pilot Flying
PIC	Pilot-in-command
PM	Pilot Monitoring
PWC	Pratt & Whitney, Canada
IVL	Operator designated 3 letter code for Sun Siyam Iru Veli Maldives water aerodrome
VFR	

UTC	Coordinated Universal Time
VOM	Operator designated 3 letter code for Vommuli water aerodrome
WNW	West to North westerly direction

SYNOPSIS

On 16 May 2023, at about 1530 hrs LT, a Viking Air DHC-6-300 (Registration Markings 8Q-TAQ) aircraft while landing at Vommuli water aerodrome impacted a swell, bounced and the LH wing dropped contacting with the water, causing significant damage to the LH wing. The crew did not notice any anomalies immediately after the landing, but the damage was discovered later.

There were no reports of any injuries to any of the occupants or any of the crew members.

The occurrence was reported to the AICC at 15:55 hours LT, and an investigation was initiated on the same day.

1. FACTUAL INFORMATION

Aircraft Legal Owner:	Trans Maldivian Airways Pvt Ltd
Registered owner:	Trans Maldivian Airways Pvt Ltd
Aircraft Type:	DHC-6-300 (Float plane)
Operator:	Trans Maldivian Airways Pvt Ltd (Air Operator Certificate No.005)
Registration:	8Q-TAQ
Number and type of engines:	2 engines / PWC
Engine hours / cycles since new:	To be determined
Location of Occurrence:	VOM (approximately 0.75 km east of Vommuli Island) 2° 54' 39.7"N; 72° 52' 24.7"E
Date and Time:	16 May 2023 at 15:20 hours LT
Persons on board:	8 (7+1)

1.1 History of Flight

1.1.1 Background

On 16 May 2022, Bombardier DHC-6-300 floatplane (registration markings 8Q-TAQ), operated by TMA, departed Sun Siyam Iru Veli Maldives water aerodrome (Aluvifushi, Dhaalu atoll) on a charter service (FLT888909) to Vommuli water aerodrome (VOM). There were 5 passengers, 2 flight crew and 1 cabin crew onboard. The FO was the Pilot Flying (PF) and the PIC was Pilot Monitoring (PM) seated on the left seat.

The aircraft was released for flight from the Operator's main base (with a Daily Inspection carried out at 18:30 hours on previous day - 15 May 2023) at Velana International Airport (MLE). Prior to the accident flight, the same aircraft was operated on sectors MLE-CEN (Centara) – LIL (Lily) – MLE, and from MLE to IVL (Sun Siyam Iru Veli Maldives).

The flight from IVL to VOM was uneventful until the initial touch down on water.

The crew did a circuit to conduct a visual check of the landing area and then decided to land parallel to the waves and continued the approach. The PIC estimated the wind was from 280° at a speed of approximately 10 knots.

During landing, the aircraft impacted a swell, resulting in a bounce that led to the LH wing drop and the wing contacting with the water. Immediately after the aircraft came to a stop, the crew checked for any damages and found the damaged LH wing was damaged.

The aircraft taxied and docked on the fixed platform and shutdown both engines. The passengers then disembarked through the main airstair door.

1.2 Injuries to Persons

Injuries	Flight Crew	Cabin Crew	Passengers	Total on board	Others
Fatal	0	0	0	0	0
Serious	0	0	0	0	0
Minor	0	0	0	0	0
Nil	2	1	4+1	7+1	0
Total	2	1	4+1	7+1	0

1.3 Damage to aircraft

Damages were found only on the LH wing (which is part of Area 4, as per the DHC-6 manual PSM 1-6-7), as detailed below:

1. LH wing Leading Edge (station 247.50 – 376.20)
2. LH wing Upper and lower surface (station 247.50 – 376.20)
3. LH Aileron and O/B Fore Flap
4. LH wingtip

1.4 Other Damage

None

1.5 Personnel Information

1.5.1 Pilot-In-Command

Age:	44 years
Nationality:	Maldives
Gender:	A (ATPL-A)

License issued on:	17 Jan 2007 (First issued date)
License expires on:	14 Sep 2027
Type of medical:	Class One (1) medical certificate
Medical issued on:	03 Sep 2022
Medical expires on:	02 Sep 2023
Types flown:	DHC6/IR
Hrs. on type:	15,586.9 hours
Ratings:	DHC6 / IR
Last Proficiency check:	01 Jan 20xx
Total hours as PIC:	14,966.5 hours
Total flight time:	-
Last 90 days:	245.31 hours
Last 28 days:	75.06 hours
Last 24 hours:	2.4 hours
Previous rest period:	11, 12 and 13 May 2023

1.5.2 Co-pilot

Age:	29 years
Nationality:	Sri Lanka
Gender:	Female
Type of License:	CPL-A
License issued on:	29 Dec 2022
License expires on:	28 Dec 2027
Type of medical:	Class One (1) medical certificate
Medical issued on:	04 Oct 2022
Medical expires on:	04 Oct 2023
Types flown:	DHC6 series
Hrs. on type:	352.5 hours
Ratings:	DHC6
Last Proficiency check:	06 Dec 2022
Total flight time:	-
Last 90 days:	228.31 hours
Last 28 days:	68.29 hours

Last 24 hours:	2.5 hours
Previous rest period:	13, 14 and 15 May 2023

1.5.3 Cabin Crew

Age:	31 years
Nationality:	Maldives
Gender:	Male
Type of License:	Cabin Crew Licence
License issued on:	02 May 2011 (First issued date)
License expires on:	06 Feb 2027
Type of medical:	Class Three (3) Medical Certificate
Medical issued on:	01 Sep 2022
Medical expires on:	31 Aug 2024
Previous rest period:	-

1.6 Aircraft Information

DHC-6-300 aircraft bearing MSN 381 was built in January 1973 by de Havilland Inc. The aircraft was registered in the Maldives for the first time on 25 October 2021 and ever since it has been in operation with TMA.

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 four-bladed, reversible-pitch, full feathering propellers. The aircraft is designed for seating two pilots, side by side with dual controls, standard and optional flight instrumentation.

Manufacturer	Viking Air (De Havilland Inc.)
Model:	DHC-6-300 series
Manufacturer’s serial number:	381
Year of Manufacture:	1973
Nationality:	8Q (Republic of Maldives)
Registration Markings:	8Q-TAQ
Certificate of Registration:	Valid – since initial issue on 25 Oct 2021

Owner:	TMA
Operator:	TMA
Validity of Certificate of Airworthiness:	Valid since initial issue on 4 Nov 2021 (Normal category)
Airworthiness Review Certificate:	Issued by MCAA on 04 Nov 2021 Valid until 03 Nov 2022 1 st Extension issued by the Operator's MCAR-M Organization – Valid until 03 Nov 2023
Total Flying Hours since manufacture:	27,151:74 hours
Total Landings since manufacture:	43,349 landings
Total Flying Hours since overhaul:	-
Last periodic inspection:	EMMA 20
Last inspection carried out at TAT/TAC:	27,079:13 hours / 43,181 cycles
Total Flying Hours since last periodic inspection:	72 hours

1.6.2 General Information

Right Engine (Gas Generator)	
Right engine manufacturer	PWC
Year of manufacture	-
Model	PT6A-27
Serial number	PC-E 51467
Total Hrs. since new	11,660.94 hours
Last overhaul date	02 Feb 2023
Hrs. since overhaul	3106.14 hours
Last check carried out	EMMA No 20 on 29 April 2023
Hrs. since last check	74.44 hours
Right Engine (Power section)	
Right engine manufacturer	PWC
Year of manufacture	-
Model	PT6A-27
Serial number	PG0085-100
Last overhaul date`	16 Feb 2021
Hrs. since overhaul:	2281.60

Last check carried out:	EMMA No 20 on 29 April 2023
Hrs. since last check:	74.44 hours
Left Engine (Gas Generator)	
Left engine manufacturer:	PWC
Year of manufacture:	-
Model:	PT6A-27
Serial number:	PCE-41105
Total hrs. since new:	30,409.55 hrs
Last overhaul date:	17 May 2010
Hrs. since overhaul:	4224.75
Last check carried out:	EMMA No 20 on 29 April 2023
Hrs. since last check:	74.44 hours
Left Engine (Power section)	
Left engine manufacturer:	PWC
Year of manufacture:	-
Model:	PT6A-27
Serial number:	P41105
Last overhaul date:	17 May 2010
Hrs. since overhaul:	4224.75
Last check carried out:	EMMA No 20 on 29 April 2023
Hrs. since last check:	74.44 hours
Right Propeller	
Manufacturer:	Hartzell
Year of manufacture:	-
Model:	HC-B3TN-3DY
Serial number:	BUA22039
Last overhaul date:	24 Jul 2020
Hrs. since last overhaul:	2372.75 hours
Last check carried out:	EMMA No 20 on 29 April 2023
Left Propeller	
Manufacturer:	Hartzell
Year of manufacture:	-

Model:	HC-B3TN-3DY
Serial number:	BUA20897
Last overhaul date:	16 April 2021
Hrs. since last overhaul:	2372.75 hours
Last check carried out:	EMMA No 20 on 29 April 2023

*Engine / Propellor details including hours are stated as provided by the Operator, and has not been independently verified.

1.6.3 Recent maintenance

The most recent maintenance inspections carried out include Equalized Maintenance for Maximum Availability (EMMA) check number 20, complied with on 29 April 2023, at 27,079.13 TAT and 43,181 TAC. The next maintenance inspection would fall due at 27,204.13 hours TAT.

As per Aircraft Technical Log (ATL) sheet number 164969, the latest daily inspection was carried out at 18:30 hrs on 15 May 2023.

1.6.4 Flight Controls

The flight controls consist of conventional, manually actuated primary flight controls operated through cables, pulleys, and mechanical linkages. Rudder and elevator trim are manually controlled and mechanically actuated; aileron trim is electrically actuated. Secondary flight controls consist of hydraulically actuated wing flaps.

1.6.5 Fuel

Jet A-1 fuel was used on the aircraft engines. Prior to departure of flight number FLT888909, the aircraft was refueled at the main base at MLE. The mass of fuel uplift, along with other fuel masses recorded on the ATL sheet are detailed below:

Departure from MLE:	610 lbs.
Arrival at VIL:	350 lbs.
Uplift from VIL:	515 lbs.
Departure from VIL:	865 lbs.

1.6.6 Defects

The crew did not report any defects, and aircraft had no recorded open defects.

1.6.7 Aircraft Load

The aircraft departed Sun Siyam Iru Veli Maldives water aerodrome (IVL) with a take-off mass of 9,954.27 lbs. The estimated landing mass at arrival in VOM was 9,904.27 lbs.

The crew were provided with a printed loadsheet which was accepted and signed by the PIC. The loadsheet was prepared by Operator's Resort Agent (an employee of the resort trained by the Operator to assist the crew in dispatch duties). The following masses were depicted in the loadsheet:

Based on the loadsheet, both takeoff and landing masses were well within the limitations set by the Operator.

The Mass & Balance Report prepared for the flight by the PIC using the aircraft Tablet, recorded the Take-Off CG at 31% MAC, and the landing CG also at 31% MAC.

1.7 Meteorological information

There was no recorded weather data available at the Vommuli water aerodrome. The nearest recorded data was available from Faafu Nilandhoo climate data (automatic weather station), which is approximately 16.36 km (8.9 nm) south of Vommuli water aerodrome.

Mean winds recorded at 15:00 hrs and 16:00 were 15 mph (13 knots) and 14 mph (12 knots) respectively, from a WNW direction. The maximum wind speed recorded between 11:00 hrs to 17:00 hrs on 16 May 2023 was 22 knots at 12:10 hrs

1.8 Aids to Navigation

There were no navigation aids available at the water aerodrome. The aircraft was operating under VFR.

1.9 Communications

There were no communication issues or defects recorded. Both VHF Communication systems were operating normally.

1.10 Aerodrome information

Arrival Aerodrome: Vommuli water aerodrome

Reference Floating – N 02° 54' 48.57', E 72°52' 03.50"
 Attached – N 02° 54' 40.58', E 72°52' 01.79"

Facilities: 1 fixed platform, 1 floating platform and 2 mooring buoys

Aerodrome License for Vommuli water aerodrome (Vommuli island, Dhaalu, Atoll) bearing license number AP/O/125, was issued to Trans Maldivian Airways Pvt Ltd., on 13 December 2016.

1.11 Flight Recorders

No flight data recorder (FDR) or Cockpit Voice Recorder (CVR) was installed on the aircraft, and they are not required under MCARs.

1.12 Wreckage and impact information

1.12.1 Wreckage Condition

For details of the damages sustained reference may be made to section 1.3 of this report.

1.12.2 Salvage operations

The aircraft was loaded onto a flat top barge and transported to Operator's main base at MLE.

1.13 Medical and pathological information

All three crew members were subjected to drug tests and the results were reported negative for all crew members.

1.14 Fire

There were no fires or fire alarms.

1.15 Survival Aspect

There was no search and rescue involved in this incident. Shortly after the incident, while the passengers and crew were on board, the aircraft taxied to the platform on its own power. Life jackets were available onboard, but none were used.

1.16 Tests and research

None carried out.

1.17 Organizational and Management Information

TMA provides domestic air services with a fleet of over 60 DHC-6 aircraft on floats. The company is authorized to conduct day VFR operations.

TMA holds AOC number 005, CAMO approval MV. CAMO.003 and MCAR 145 Maintenance Organisation Approval number MV.145.025 issued by the MCAA.

1.18 Additional Information

None

2. INITIAL FINDINGS

2.1 Photos of aircraft damages – LH Wing



Figure 1 LH Wing Damage



Figure 3 LH Wing (RIB NO. 28) Damage



Figure 2 LH Wing Damage



Figure 4 LH Wing Damage



Figure 5 LH Aileron Damage



Figure 6 LH Wing Leading Edge Damage



Figure 6 LH Wing Top Damage



Figure 8 LH Wing Leading Edge Damage