

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



ACCIDENT INVESTIGATION COORDINATING COMMITTEE

AIRCRAFT ACCIDENT REPORT P2021/02

PRELIMINARY REPORT

**ON INVESTIGATION OF THE SERIOUS INCIDENT INVOLVING VIKING AIR
DHC-6-300, 8Q-MBC AIRCRAFT
AT FINOLHU RESORT WATER AERODROME, MALDIVES**

on 13 November 2020

(This is a preliminary report and is subject to change, and may contain errors. Any errors in this report will be corrected in the final report)

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 as envisaged in Annex 13 to the Convention.

In investigating this serious incident, AICC was assisted by Maldives Civil Aviation Authority (MCAA), and Trans Maldivian Airways.

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

The report is released on 9 December 2021.

Mr. Abdul Razzak Idris

Chairperson

Accident Investigation Coordinating Committee



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LIST OF ABBREVIATIONS

AFT	: Aft
AICC	: Accident Investigation Coordinating Committee
ATL	: Aircraft Technical Log
CVR	: Cockpit Voice Recorder
DHC-6-300	: Viking Air Twin Otter 300 series aircraft
ELT	: Emergency Locator Transmitter
EMMA	: Equalized Maintenance for Maximum Availability
FDR	: Flight Data Recorder
FIN	: Operator designated 3 letter code for Finolhu water aerodrome
FO	: First Officer
FWD	: Forward
lbs.	: Pounds
LH	: Left Hand
LOPA	: Layout of Passenger Accommodation
MCAA	: Maldives Civil Aviation Authority
MCAR	: Maldives Civil Aviation Regulations
MLE	: IATA designated three letter code for Velana International Airport
MMG	: Operator designated 3 letter code for Maamunaga water aerodrome
MTOM	: Maximum Take-Off Mass
PIC	: Pilot-in-command
RFR	: Operator designated 3 letter code for ReethiFaru water aerodrome
RH	: Right Hand
STC	: Supplemental Type Certificate
TAC	: Total Air Cycles
TAT	: Total Air Time
TBD	: To be determined
T/O	: Take-Off
TMA	: Trans Maldivian Airways Pvt. Ltd.
UTC	: Coordinated Universal Time
VIA	: Velana International Airport

SYNOPSIS

On 13 November 2021, DHC6-300 aircraft, registration 8Q-MBC operated by Trans Maldivian Airways Pvt. Ltd., was on a charter flight, from Finolhu Resort (Kanifushi island, Baa Atoll), to Velana International Airport. There were 15 (fifteen) passengers, two pilots and one cabin crew onboard the aircraft.

During take-off from the Island in a north-westerly direction, towards a stretch of water bungalows, the crew aborted the take-off. While aborting the take-off the crew attempted to reverse both the engines but were not able to move the power levers to reverse the aircraft. The crew then shut down both engines, but under momentum the aircraft kept moving until it collided with water bungalow and stopped. The aircraft sustained damages to its LH wing, RH wing tip, and one of the RH propeller blades.

A dinghy was used to tow the aircraft back to the floating platform and the passengers and crew disembarked safely. No injuries to crew or passengers were reported.

At the time of the incident strong winds were reported and the water was choppy. Weather data from the nearest automatic weather station recorded wind speeds of 25 mph (21.7 knots) from WSW at the time of the incident.

The incident occurred at 17:11 hrs and the MCAA reported the accident to the Accident Investigation Coordinating Committee (AICC) at 19:04 hrs on the same day. AICC began its investigation on the following day by interviewing the crew members. One investigator from AICC and two investigators from MCAA traveled to the accident site on 14 November 2021, and continued the investigations. A second visit was made to the accident site on 16 November 2021 by two investigators from AICC along with a flight crew member and a B1 licensed certifying staff from the Operator.

1.0 FACTUAL INFORMATION

Legal 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 now owned by Viking Air Ltd.)
Manufacturers Serial No.:	256
Place of Accident:	Finolhu Resort (Kanifushi Island, Baa Atoll) Latitude: 05° 0' 48.18" N Longitude: 72° 57' 11.71" E
Date and Time:	13 November 2020 at 17:11 hrs.

1.1 History of Flight

1.1.1 Background

The aircraft was dispatched on 13 November 2021, on a multi-sector flight, (flight number FLT772157), MLE – MMG – ReethiFaru Resort (RFR) – Finolhu Resort (FIN) and then back to MLE with 3 crew members (2 flight crew and 1 cabin crew). A total of 16 passengers were on board with 4 destined to MMG and the rest 11 passengers to ReethiFaru Resort. The aircraft was then scheduled to pick up passengers from RFR and FIN and to return back to MLE.

The aircraft was released for flight at 14:35 hrs, at main base (VIA) on 13 November 2021.

Aircraft daily inspection was carried out on 12 November 2021, and there was no record of any open deferred defects listed in the Aircraft Technical Log (ATL).

The incident flight was operated by the PIC who was seated on the right seat as it was intended for a training flight for the other crew member. According to the flight crew, no abnormalities were observed in any of the previous flights and on this flight until the aircraft failed to produce sufficient lift for take-off and subsequently the take-off was aborted. As the crew were unable to move the power levers to the reverse position, the crew decided to shutdown both engines.

The aircraft moved forward under momentum even after the engines were shut down and collided with water bungalows. As a result of the collision, both the aircraft and the bungalows sustained damages. The RH propeller, RH wing tip and the LH wing were damaged.

The aircraft was towed back to the platform by a dinghy.

Once the aircraft was secured at the platform all passengers and crew disembarked safely, followed by offloading the baggage. No injuries to crew or passengers were reported.

On the day both the PIC and the FO reported to duty at 0530 hrs at TMA base. The PIC was reporting for the first day of duty after a three-day rest period. The FO was on the third day of his duty, after a three-day rest period. Both crew members were paired to fly together in the past.

The crew carried out the pre-flight and walk-around checks prior to the first flight of the day. No abnormalities were reported by the crew.

1.1.2 Aircraft

The aircraft (MSN: 256) was manufactured in July 1969 by de Havilland Canada. The aircraft was first registered in the Maldives on 7 January 2010 and is currently operated by Trans Maldivian Airways Pvt Ltd.

1.1.2 Flight crew

The flight was operated by three crew members. Detailed information on crew qualification are included in section 1.5 of this report.

1.2 Injury to Persons

Injuries	Flight Crew	Cabin Crew	Passengers	Others
Fatal	0	0	0	Nil
Serious	0	0	0	Nil
Minor	0	0	0	Nil
Nil	2	1	15	Nil
Total	2	1	15	Nil

1.3 Damages to aircraft

Survey of the aircraft revealed the extent of the damages caused to the wing and propellers. The damages include but are not limited to:

1. Left Wing leading edge dented in three places
2. Right Wing tip damaged
3. Right propeller damaged

1.4 Other damage

As a result of the collision, two water bungalows were damaged. The wooden structure for the steps were damaged and some planks were dislocated.

1.5 Personnel information

1.5.1 Pilot-In-Command

Age:	44 years
Nationality:	Maldives
Gender:	Male
Type of License:	Air Transport Pilot License - A
License issued on:	01.03.2018
License expires on:	23.03.2023
Type of medical:	Class 1 medical certificate
Medical issued on:	10.07.2021
Medical expires on:	10.07.2022
Types flown:	DHC-6 series
Hrs. on type:	14,706.5 hrs.
Ratings:	DHC-6 / IR
Last Proficiency check:	19.03.2021
Total hrs. as PIC:	12,500.4 hrs.
Total flight time:	15,006.5 hrs.
Last 90 days:	263.28 hrs.
Last 28 days:	98.8 hrs.
Last 24 hrs.:	6.5 hrs.
Previous rest period:	10, 11 and 12 November 2021

1.5.2 Co-pilot

Age:	34 years
Nationality:	Maldives
Gender:	Male
Type of License:	CPL-A
License issued on:	7.12.2017
License expires on:	17.01.2023
Type of medical:	Class 1 medical certificate
Medical issued on:	10.08.2021
Medical expires on:	10.08.2022
Types flown:	DHC-6 series
Hrs. on type:	4851.01 hrs.
Ratings:	DHC-6

Last Proficiency check:	19.03.2021
Total flight time:	5148.81 hrs.
Last 90 days:	191.91 hrs.
Last 28 days:	87.31 hrs.
Last 24 hrs:	12.6 hrs.
Previous rest period:	8, 9 and 10 November 2021

1.5.3 Cabin Crew

Age:	34 years
Nationality:	Maldives
Gender:	Male
Type of License:	Cabin Crew License
License issued on:	13.11.2018
License expires on:	12.11.2023
Type of medical:	Class 3
Medical issued on:	15.09.2020
Medical expires on:	14.09.2022
Previous rest period:	7, 8 and 9 November 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 four-bladed, reversible-pitch, full feathering propellers manufactured by MT Propeller, Germany. This type of MT propeller is installed under an STC approved by MCAA. The aircraft is designed for seating two pilots, side by side with dual controls and standard flight instrumentation.

Manufacturer:	de Havilland Canada
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:	51,892.72 hrs. and 91,358 landings
Certificate of Airworthiness:	Normal category, issued on 20 Jan 2010

Airworthiness Review Certificate:	Issued on -20 Jan 2019 - extended until 20 Jan 2022
Last periodic inspection	EMMA No 28 on 26 October 2021
Last inspection carried out TAT / CYC	51,803.97 hrs / 91,156 cycles

Last Daily Inspection was carried out at 21:00 hrs on 12 Nov 2021, and the last engine wash was recorded as carried out on 13 No 2021 – the day of occurrence.

1.6.2 Engines and Propellers

Right Engine (Gas Generator)	
Right engine manufacturer	Pratt & Whitney Canada
Year of manufacture	TBD
Model	PT6A-27
Serial number	PCE 51552
Total Hrs. since new	17,720.09
Last overhaul date	TBD
Hrs. since overhaul	4,430.69 hrs.
Last check carried out	EMMA #28 dated 26 October 2021
Hrs. since last check	88.75 hrs.
Right Engine (Power Section)	
Right engine manufacturer	Pratt & Whitney Canada
Year of manufacture	TBD
Model	PT6A-27
Serial number	PCE 51552
Last overhaul date	TBD
Hrs. since overhaul:	4430.69
Last check carried out:	EMMA #28 dated 26 October 2021
Hrs. since last check:	88.75 hrs.
Left Engine (Gas Generator)	
Left engine manufacturer:	Pratt & Whitney Canada
Year of manufacture:	TBD
Model:	PT6A-27

Serial number:	PCE-41747
Total hrs. since new:	26,487.10 hrs.
Last overhaul date:	TBD
Hrs. since overhaul:	3427.28 hrs
Last check carried out:	EMMA #28 dated 26 October 2021
Hrs. since last check:	88.75 hrs
Left Engine (Power Section)	
Left engine manufacturer:	Pratt & Whitney Canada
Year of manufacture:	TBD
Model:	PT6A-27
Serial number:	40904-100
Last overhaul date:	TBD
Hrs. since overhaul:	2427.28 hrs.
Last check carried out:	EMMA #28 dated 26 October 2021
Hrs. since last check:	88.75 hrs
Right Propeller	
Manufacturer:	MT Propeller
Year of manufacture:	2021
Model:	MTV-16-1ECFR(P)
Serial number:	200446
Last overhaul date:	N/A
Hrs. since last overhaul:	N/A
Last check carried out:	EMMA #28 dated 26 October 2021
Left Propeller	
Manufacturer:	MT Propeller
Year of manufacture:	2021
Model:	MTV-16-1ECFR(P)
Serial number:	200445
Last overhaul date:	N/A
Hrs. since last overhaul:	N/A
Last check carried out:	EMMA #28 dated 26 October 2021

1.6.3 Cabin Layout and Configuration

Cabin was configured under a LOPA approved by an EASA approved Design Organization to carry fifteen passengers and one cabin crew in a standard floatplane configuration. In this configuration the seat 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 luggage normally carried by fifteen passengers. The aft baggage compartment is only used for loading smaller luggage.

The aircraft was in float configuration with Wipaïre 13000 floats installed. The aircraft had four exits in the cabin and two 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) check number 28 complied with on 26 October 2021, at 51,803.97 TAT and 91,156 TAC.

1.6.5 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. No abnormalities were reported on the flight controls.

1.6.6 Powerplants

Aircraft was fitted with two Pratt & Whitney PT6A-27 engines.

1.6.7 Fuel

Jet A-1 fuel was used on the aircraft. The calculated mass of fuel, as computed by the flight crew prior to departure was 425 lbs for FWD tank and 425 lbs for AFT tank, totaling a mass of 850 lbs. (TMAPP WB Report ID 622597- dated Saturday 13 Nov 2021, 17:05:26 – FIN to MLE). An entry in the Aircraft Technical Logbook, (Log number 143903, route entry row number 12) states that 50 lbs of fuel was available at departure.

The fuel gauges indicate 411 lbs on LH gauge (FWD tank) and 427 lbs on the RH gauge (AFT tank), totaling a fuel mass of 838 lbs. when the investigation started.

1.6.8 Accessories

Aircraft was fitted with Garmin G900 suite. The associated data cards were recovered without damage and available for the investigation.

1.6.9 Defects

The aircraft had no open defects.

1.6.10 Aircraft load

The aircraft departed ReethiFaru water aerodrome with a take-off mass of 10,455 lbs. The landing mass recorded at arrival in Finolhu Resort water aerodrome was 10,305 lbs.

Mass breakdown at departure from Finolhu:

Passengers in transit:	Male 1, Female 3
Mass of passengers:	639 lbs
Mass of luggage 7 nos:	195 lbs

Passengers joining at Finolhu Resort:	Male 4, Female 5, Child 1, Infant 1
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Mass of joining passengers:	1583 lbs
Mass of luggage 13 nos:	431 lbs
Co-Mail:	5 lbs
Actual T/O mass:	12,277 lbs
Max T/O limit as per AFM	12,500 lbs

In the Operator's main base at VIA, the hand luggage is recorded separately, but elsewhere the mass of hand luggage is not recorded separately. The Resort Agent at RFR confirmed that the mass of hand luggage is included in the luggage mass.

1.6.11 Load sheet

A Mass and Balance Report produced by the Flight crew before departure was available on the tablet. For both the take-off and landing, the CG remains within limits.

1.7 Meteorological information

There was no recorded weather data available at the Finolhu water aerodrome, and the nearest recorded data was available from Dharavandhoo automatic weather station, which is approximately 25km north-east of Finolhu water aerodrome. At 17:10 hrs on 13 November the weather data was mean winds at 24.5 mph (gusting 30.6 mph) from WSW direction.

A weather alert over Baa Atoll was active from 1700 to 1800 hrs on 13 November 2021. A yellow alert was issued at 15:40 hrs on 13 November 2021 suggesting strong winds of 25 -30 mph and gusts of 40mph with rough seas expected.

1.8 Aids to navigation

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

1.9 Communications

There were no communication problems or system anomalies throughout the flight from taxi to aborted take-off and back to platform.

1.10 Aerodrome information

Departure Aerodrome: Finolhu Resort water aerodrome

Reference Floating – N 05° 0' 48.18', E 72°57' 20.22'

Attached – N 05°44.488', E 72°57'; 19.067

N 05° 0' 44.84', E 72° 57' 11.71"

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

Location of the water aerodrome, including 2 water runways are marked on the aerodrome chart, published by the Operator.

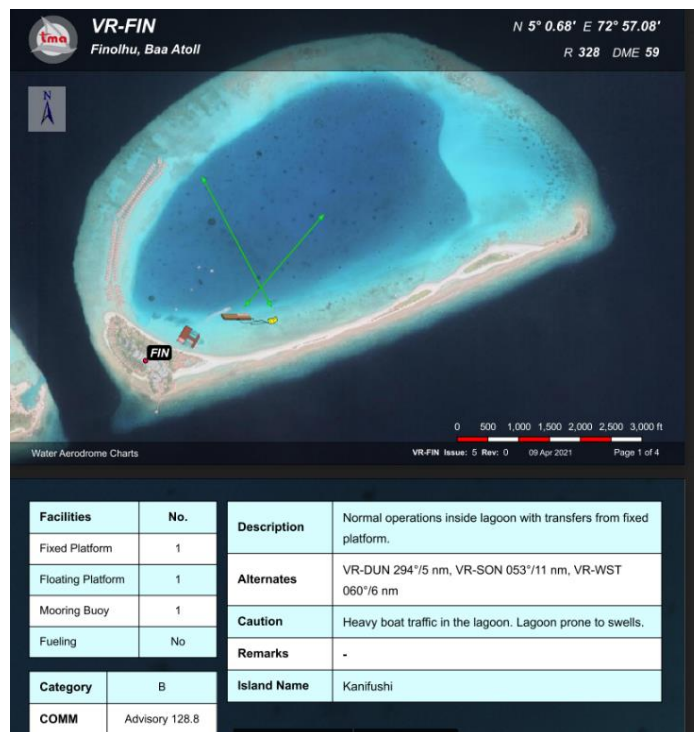


Figure 1: Finolhu Resort Water Aerodrome Chart

Aerodrome License for Finolhu Resort (Kanifushi Island), bearing license number AP/O/92, was issued to Trans Maldivian Airways Pvt Ltd., on 28 November 2010.

1.11 Flight Recorders

No flight data recorder (FDR) or cockpit voice recorder (CVR) was installed on the aircraft, as MCARs permit operation of the DHC6, series 100/200/300 aircraft without them.

However the aircraft was installed with a Garmin G900 suite and the recorded data saved on the SD cards were made available for review during the investigations.

1.12 Wreckage and impact information

1.12.1 Accident site visit

Accident site was visited by investigators from both MCAA and AICC. During this visit the aircraft was visually checked for damages. The damages on the water bungalow were also noted. The aircraft system functional checks were carried out as far as possible except for the RH engine run.

1.12.2 Wreckage Condition

For damage information refer to 1.3.

1.12.3 Salvage operations

A dinghy was used to tow the aircraft to the floating platform.

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 members.

1.14 Fire

There was no fire or fire alarms.

1.15 Survival Aspect

There was no search and rescue involved in this incident. Soon after the collision the aircraft was towed back to the platform by a dinghy. No failure of seats, seat belts or overhead bins were reported. Life jackets and seat belts were available on board but none was used. The impact forces appear to be minimal.

1.16 Tests and research

LH Engine run was carried out to see if there was any problem in applying reverse. The reverse operation was found to be functioning during this engine run, suggesting that the situation reported by the flight crew was not present at the time of testing.

1.17 Organizational and Management Information

TMA is a MCAA approved Air Operator Certificate holder. TMA provides domestic air services with a fleet of over 50 DHC-6 aircraft on floats. The company is authorized to conduct day VFR Operations.

The company holds Aircraft Maintenance Organization Approval reference MV.145.025 issued by the MCAA.

1.18 Additional Information

None

1.19 Useful or Effective Investigation Techniques

The recorded data on G900 suite will be used to recreate probable flight path and / or to gather information of aircraft and / or engine performance on the incident flight.

2.0 INITIAL FINDINGS

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

1. The aircraft was operated during a yellow alert period with recorded high winds
2. The crew was rushing to depart from FIN and to reach MLE where a quick turn-round is essential to complete the next leg of the day – under VFR conditions
3. The PIC was the PF while seated on the Right seat of the aircraft
4. The aircraft lifted off for a few seconds and dropped afterwards
5. The scales used for weighing baggage are provided by the Operator and due to its self-calibration feature, neither the resorts nor the Operator has maintained any records of calibration
6. The hand luggage is weighed using a hand held scale provided by the Resort and Operator do not have any records to confirm the calibration status of the scales

3.0 SAFETY RECOMMENDATIONS

TBD

4.0 APPENDICES

4.1 Aircraft take-off path



8Q-MBC approximate flight path