



ACCIDENT INVESTIGATION COORDINATING COMMITTEE

AIRCRAFT ACCIDENT REPORT 2015/01

**PRELIMINARY REPORT ON THE ACCIDENT TO
VIKING AIR DHC-6-300, 8Q-MAN
NEAR KUREDU RESORT, MALDIVES
on 2nd July 2015**

Operator: Trans Maldivian Airways Pvt. Ltd.
Manufacturer: Viking Air
Model: DHC-6-300 (Floatplane)

INTRODUCTION

Maldives is a signatory to 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.

The report is based upon the investigation carried out to date 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 and the Final Report is to prevent accidents and incidents. It is not the purpose of this investigation apportion blame or liability as envisaged in Annex 13 to the Convention.

The AICC was assisted by the Maldives Civil Aviation Authority (CAA), Trans Maldivian Airways, the Maldives National Defense Force and the Maldives Police Service.

The recommendations in this report are addressed to the CAA, unless otherwise stated. It is CAA who will decide on implementation.

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

The report is released on 26th August 2015.

Mr. Abdul Razzak Idris
Chairperson
Accident Investigation Coordinating Committee



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List of Abbreviations

AICC	: Accident Investigation Coordinating Committee
ATC	: Air Traffic Controller
CG	: Centre of Gravity
C of A	: Certificate of Airworthiness
COM	: Communication
C of R	: Certificate of renewal
CRM	: Crew Resource Management
CAR	: Civil Aviation Regulation
CVR	: Cockpit Voice Recorder
DHC-6-300	: Viking Air Twin Otter 300 Series
F/O	: First Officer
HF	: High Frequency
ICAO	: International Civil Aviation Organization
IFR	: Instrument Flight Rules
KOM	: Komandoo Resort
km	: Kilometer
KNU	: Kanuhura Resort
KUR	: Kuredu Resort
Lbs	: Pounds
LH	: Left hand
LMC	: Last Minute Change
LT	: Local time
MAR	: Maldivian Airworthiness Requirements
MCAA	: Maldives Civil Aviation Authority
MCAR	: Maldivian Civil Aviation Regulation
MDI	: Palm Beach Resort
MEL	: Minimum Equipment List
MLE	: Male'
MTOW	: Maximum take-off weight
NM	: Nautical Mile
PF	: Pilot Flying
PIC	: Pilot in command
PROP	: Propeller
RH	: Right hand
RWY	: Runway
SIC	: Second in command
SOP	: Standard Operating Procedures
TBA	: To be assessed
TBD	: To be determined
TMA	: Trans Maldivian Airways Pvt. Ltd.
UTC	: Universal Coordinated Time
VFR	: Visual Flight Rules
VMC	: Visual Meteorological Conditions

Synopsis

On 2nd July 2015 DHC-6 aircraft, registration number 8Q-MAN owned and operated by Trans Maldivian Airways was on a schedule flight enroute Male'-Komandoo (KOM)-Kuredu (KUR). The aircraft was to shut down at Kuredu for the night. The flight was planned in accordance with the visual flight rules (VFR). There were 15 passengers, two pilots, one cabin crew on board the aircraft, at the time of departure from Male; 4 passengers disembarked at Komandoo. The accident occurred on the sector from Komandoo to Kuredu. The pilot flying (PF) the sector was the first officer.

The aircraft was on approach to land North West bound to Kuredu. At about 400ft, after selection of full flaps, the aircraft started to pitch up and the pilot flying almost lost control of the aircraft. At this point the PIC took over the control and the recovery procedures were applied. Before the PIC could regain full control, the aircraft impacted the sea. On initial impact the left float detached. This was followed by the right float impacting the sea and subsequently detaching itself from the aircraft. With no floats to hold, water rushed inside the aircraft and the aircraft started sinking.

The passengers and crew were able to evacuate before the aircraft submerged completely. No passenger or crew sustained any injuries and they were safely taken to Kuredu Resort.

The investigation identified the following causal factors:

TBD

Investigation

The accident occurred at 1733hrs. Trans Maldivian Airways reported the accident to the Aircraft Accident Investigation committee (AICC) at 1750hrs. The investigation was opened in cooperation with the Maldives Police Services. Two officials from CAA representing AICC arrived at the accident site at 2300hrs.

The accident site was secured by MNDF Coast Guard. The salvage process was then carried out and aircraft was brought to a secure place for further investigation.

The engines were sent to Pacific Turbine Brisbane (MV.145.038) Australia where engine inspection and testing is to be carried out for possible internal failures.

1. FACTUAL INFORMATION

Operator:	Trans Maldivian Airways Pvt Ltd. (Air Operator Certificate No.005)
Aircraft Type:	Viking Air DHC-6-300
Aircraft Manufacturer:	Viking Air Pvt Ltd.
Aircraft Owner:	Trans Maldivian Airways Pvt. Ltd
Nationality:	8Q (Maldives)
Registration:	8Q-MAN
Place of Accident:	Near Kuredu Island Resort
Date and Time:	2 July 2015 @1733 hrs LT

1.1 History of Flight.

1.1.1 Aircraft

The aircraft 8Q-MAN made 8 sectors (3.75 hours of flight time) on the day before the accident and 4 sectors (1.62 hours of flight time) on the accident date prior to the accident flight. No defects were reported on these flights and the aircraft had no outstanding deferred defects.

1.1.2 Flight crew

The commander of the aircraft was on the first working day after two days off. The co-pilot was on the second working day after returning from a month of annual leave.

The PIC has been flying DHC6 on floats in Maldives for more than 5 years. The copilot has been flying DHC6 on floats since June 2014. Both pilots involved in the accident had flown to Kuredu several times.

After adequate rest, the flight crew reported for duty on 2nd July 2015 at 0800hrs. at base. As per the schedule, assigned flights for the day on 8Q-MAN were:

1. Male-Angaga-Conrad (day shutdown of 5hrs) and back to Male'
2. Male'-Komandoo-Kuredu (night shut down at Kuredu)

1.1.3 Flight preparation

TBD

1.1.4 History of the flight

When the aircraft returned to Male from Conrad the aircraft was confirmed for the next flight ("flight release" had been issued by Dispatch). On arrival the loading staff unloaded the luggage and started loading for the scheduled flight from Male'-Komandoo-Kuredu (night shutdown). The flight was released with 3 crew members (2 flight crew and 1 cabin crew) and 15 passengers (4 passengers to Komandoo and 11 passengers to Kuredu). As per the flight release (manifest),

the aircraft was loaded with 779 lbs of luggage (out of which 166 lbs to KOM and 613 lbs to KUR) and 820 lbs. of fuel, with a take-off mass of 12,484 lbs.

The aircraft departed Male' at 1625hrs. The PIC was PF for the first sector of the flight. Taxi-out, take-off, cruise and the landing at Komandu were normal according to the PIC. The aircraft landed at Komandu at 1710 hrs.

Four passengers disembarked and 166lbs of luggage was offloaded from the aircraft. The second sector of the sequence was Komandu-Kuredu with an approximate flight duration of five minutes. The copilot was PF for this sector.

In preparation for the landing, on turning final, the copilot requested full flaps and propeller levers forward. On selection of full flaps and propeller levers forward, the nose of the aircraft started to pitch up. The aircraft kept increasing in pitch attitude, followed by the right wing drop and into a right turn with a vibration of the control column. The copilot felt losing control of the aircraft at this stage and handed over the controls to the PIC. The PIC took over the controls and the recovery procedures were applied. However before the PIC could regain full control, the aircraft impacted the sea.

Right after impact, water started rushing inside the aircraft. The copilot and the cabin crew initiated the evacuation. The passengers and crew were able to evacuate through the left rear passenger door before the aircraft sank. PIC evacuated last after securing the aircraft. None of the passengers or crew sustained any injuries. A boat from Kuredu Resort arrived at the scene and passengers and crew were rescued and taken safely to Kuredu Resort.

The wreckage was found on the next day in a depth of 36.5m approximately 3km southeast of Kuredu Resort.

1.2 Injury to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Total in the aircraft</i>	<i>others</i>
Fatal	0	0	0	NIL
Serious	0	0	0	NIL
Minor	0	0	0	NIL
None	3	11	14	NIL
Total	3	11	14	NIL

1.3 Damages to aircraft

TBA

1.4 Other damage

TBA

1.5 Personnel information

1.5.1 PIC –

Age: 39
Nationality: Canadian
Gender: Male
Type of Licence: Airline Transport Pilot Licence (Aeroplanes)
Medical issued on: 19 May 2015
Medical expires on: 19 May 2016
Type of medical: Class 1
Licence issued on: 6 March 2014
Licence expires on: 5 March 2016
Types flown: DHC-6 (on Maldivian licence)
Cessna150/152/172/310, Piper PA-44, Harbin Y-12,
Hours on type: 4200 hrs
Ratings: DHC-6 Float Plane
Last Proficiency check: 13 March 2015
Total hours as PIC: 1225hrs (on types)
Total flight time: 5075hrs

1.5.2 Co-pilot –

Age: 32
Nationality: Swedish
Gender: Female
Type of Licence: Validation (Aeroplanes)
Medical issued on: 2 January 2015
Medical expires on: 1 February 2016
Type of medical: Class 1
Validation issued on: 25 September 2014
Validation expires on: 24 September 2015
Types flown: DHC-6, DA20m DA40, DA42, C172
Hours on type: 705 hrs
Ratings: DHC-6 Float Plane
Last Proficiency check: 15 May 2015
Total flight time: 988 hrs

1.5.3 Cabin Crew –

Age: 21
Nationality: Maldivian
Gender: Male
Licence issued on: 14 November 2013
Licence expires on: 13 November 2018
Medical issued on: 30 October 2013

Medical expires on: 1 November 2015
Type of medical: Class 3

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.

Manufacturer: Viking Air
Registration: 8Q-MAN
Powerplants: 2 x Pratt & Whitney PT6A-27 tuboprop engines
Manufacturer’s serial number: 435
Year of construction: 1975
Airframe hours at time of accident: 24,123.12 hrs
Certificate of Airworthiness: Normal category issued on 9 November 2009
Airworthiness Review Certificate: 13 May 2015

1.6.2 Aircraft History –

Total flying hours since: -

- manufacture: 24,121.5 hrs (as of 1 July 2015)
- last periodic inspection: Emma# 14
- last inspection carried out at TAT: 24,103.6 hrs

1.6.3 Engines and propellers –

Right Engine (Gas Generator)

Right engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 1975
Model: PT6A-27
Serial number: PCE41093
Total Hours since new: 27,180.7 (as of 1st July 2015)
Last overhaul date: 13 November 2007
Hours since overhaul: 5,059.3 hours (as of 1st July 2015)
Last check carried out: EMMA # 14
Hours since last check: 17.9 hours (as of 1st July 2015)

Right Engine (Power Section)

Right engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 1975
Model: PT6A-27
Serial number: PCE41093
Last overhaul date: 13 November 2007
Hours since overhaul: 5,059.3 hours (as of 1st July 2015)

Last check carried out: EMMA # 14
Hours since last check: 17.9 hours (as of 1st July 2015)
Left Engine (Gas Generator)
Left engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 1980
Model: PT6A-27
Serial number: PCE42022
Total Hours since new: 12,272.2 (as of 1st July 2015)
Last overhaul date: 23 December 2013
Hours since overhaul: 1,751.2 hours (as of 1st July 2015)
Last check carried out: EMMA # 14
Hours since last check: 17.9 hours (as of 1st July 2015)

Left Engine (Power Section)
Left engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 1980
Model: PT6A-27
Serial number: 42022-100
Last overhaul date: 23 December 2013
Hours since overhaul: 1,751.2 hours (as of 1st July 2015)
Last check carried out: EMMA # 14
Hours since last check: 17.9 hours (as of 1st July 2015)

Right Propeller
Manufacturer: Hartzell Propeller Inc
Year of manufacture: 1979
Model: HC-B3TN-3DY
Serial number: BUA25676
Last overhaul date: 29 May 2014
Hours since last overhaul: 1,287.0 hours (as of 1st July 2015)
Last check carried out: EMMA #14

Left Propeller
Manufacturer: Hartzell Propeller Inc
Year of manufacture: 2001
Model: HC-B3TN-3DY
Serial number: BUA24463
Last overhaul date: 15 May 2015
Hours since last overhaul: 26.6 hours (as of 1st July 2015)
Last check carried out: EMMA #14

1.6.4 Cabin Layout and Configuration

The aircraft was in float configuration with Wipaire 13000S floats. The cabin was configured for 15 passengers. Baggage is placed near the right rear passenger door or the aft baggage

compartment. The aircraft has four exits in the cabin and two exits in the cockpit. The left rear passenger door was used to evacuate on the accident flight.

1.6.5 Fuel – Type of fuel used: Jet A1

1.6.6 Accessories – No recorded component failures.

1.6.7 Defects – No deferrals.

1.6.8 Aircraft load – Maximum take-off weight: 12,500 lbs.
MLE-KOM take-off weight: 12,484 lbs.
KOM-KUR take-off weight: 11,200 lbs.

1.6.8.1 Load sheet – The load sheet served as the passenger manifest. A copy of the load sheet was retained with dispatch before take-off as required per the company Operations Manual.

1.7 Meteorological information

Meteorological information of Male' (VRMM) and Hanimaadhoo (VRMH) issued on 2nd July 2015 at 1100 UTC

Type and Area	Date & Time in UTC	Weather	Remarks
TAF VRMM	021100Z 0212/0318	27008KT 9999 FEW019 TEMPO 0212/0218 FEW020CB	Nil
TAF VRMH	021100Z 0212/0312	28009KT 9999 FEW018 TEMPO 0212/0218 SCT018 FEW019CB SCT130	Nil

Dharavandhoo (VRMD)

On 2nd July 2015: the winds were variable between 280 and 290 degrees at 10 kts. QNH and temperature information is not available at Dharavandhoo.

1.8 Aids to navigation

The aircraft was operating under VFR conditions.

1.9 Communications

Two VHF sets COM1 and COM2 were both serviceable at the time of departure. No communication problem was reported.

1.10 Aerodrome information

Destination Aerodrome: Kuredu, Lhaviyani Atoll
Reference: N05' 32.89' / EO73' 27.92'
Facilities: 2 fixed platforms and 6 mooring buoys
Alternate: 1. MLE 181° – 82 nm
 2. KOM 230° – 6 nm
 3. KNU 112° – 3 nm
 4. MDI 137° – 8 nm

The aircraft approached to land on the North West bound to Kuredu. The surface conditions were reported with light winds and calm seas.

1.11 Flight Recorders

The aircraft was not equipped with flight data recorder (FDR) or cockpit voice recorder (CVR). Maldivian regulations does not require a FDR/CVR to be fitted in DHC-6 aircraft.

1.12 Wreckage and impact information

1.12.1 Accident site visit

Officials from CAA visited Kuredu resort on the day of the accident to collect the available evidence and information regarding the accident.

Both floats were found floating on the water, in the vicinity of the accident site and was taken to Huravalhi Island (Near Kuredu resort). No search operation was conducted on the day of the accident since it was getting dark. Search operation started in the next morning. The main wreckage was found lying belly up at a depth of 36.5m about 3km southeast of Kuredu resort. Parts of float stairs and elevator was also found lying on the sea bed.

1.12.2 Salvage operations

Before commencement of the salvage work, the main wreckage and the parts lying on the surface of the sea were photographed, videotaped, recorded and the wreckage was salvaged.

1.13 Medical and pathological information

Medical examinations were performed on all crew members of the aircraft with the help of Maldives Police Services. Alcohol and drug tests were negative and both pilots had a valid Class 1 medical.

1.14 Fire

There was no evidence of fire in flight or after the impact.

1.15 Survival Aspect

Aircraft came to a halt on the water, with no fire. All the passengers and crew had their seat belts on. Cabin crew and the copilot initiated the evacuation immediately after impact. Left rear main door was used to evacuate the aircraft; some passengers were wearing life jackets.

1.16 Tests and research

TBA

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 46 DHC-6 on floats. The company is authorised to conduct non-scheduled VFR Operation.

Regular inspections and periodical flight checks were conducted on the operation and crew respectively by the CAA to verify compliance and competency. The company also hold MCAR-145 approval and annual audits are being carried out by the CAA inspectors in addition to random spot checks and regular Airworthiness Review Inspection of TMA fleet.

1.18 Additional Information

AICC investigation team analysed the evidence available. All flight crew, passengers involved in this incident and key eyewitnesses were interviewed by the Committee.

1.19 Useful or Effective Investigation Techniques

The investigation is being conducted in accordance with accident investigation policies and procedures, and in accordance with the standards and recommended practices of Annex 13 to the Chicago Convention.

2. ANALYSIS (Reserved)

3. CONCLUSIONS (Reserved)

4. RECOMMENDATIONS (Reserved)

Report compiled by:
Accident Investigation Coordinating Committee
Date: 26th August 2015