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ACCIDENT INVESTIGATION COORDINATING COMMITTEE

AIRCRAFT ACCIDENT REPORT 2017/01

**PRELIMINARY REPORT ON INVESTIGATION OF THE
ACCIDENT OCCURRED ON VIKING AIR DHC-6-300,
8Q-TMV AIRCRAFT AT VELANA INTERNATIONAL
AIRPORT, MALDIVES**

on 27th May 2017

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

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.

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 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 the Maldives Civil Aviation Authority (CAA), Trans Maldivian Airways, the Maldives National Defense Force and the Maldives Police Service.

The recommendations in the Final Report are addressed to the stakeholders.

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

The report is released on 27th September 2017.

Mr. Abdul Razzak Idris
Chairperson

Accident Investigation Coordinating Committee



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List of Abbreviations

AICC	: Accident Investigation Coordinating Committee
ARFF	: Airport Rescue & Fire Fighting
BIY	: Biyadhoo
COM	: Communication
CVR	: Cockpit Voice Recorder
CON	: Conrad Maldives Rangali Resort
DHI	: Ananthara Maldives (Dhigufinolhu)
DHC-6-300	: Viking Air Twin Otter 300 Series
EMF	: Embudu Finolhu (Taj Exotica)
FDR	: Flight Data Recorder
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
NM	: Nautical Mile
PF	: Pilot Flying
PIC	: Pilot in command
RIH	: Rihiveli
RWY	: Runway
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 27th May 2017, DHC-6 aircraft, registration number 8Q-TMV owned by BEAU DEL LEASING INC and operated by Trans Maldivian Airways was on a chartered flight from Rangali Island resort, Conrad Maldives to Velana International Airport. The flight was conducted in accordance with the visual flight rules (VFR). There were nine passengers, two pilots and one cabin crew on board the aircraft. The accident occurred during landing on the water aerodrome at Velana International Airport.

The aircraft, while landing on the North Right Water Runway, touched down on the left float and repeatedly bounced. After the second bounce, while the aircraft was still airborne, it banked to the right dipping the right wing tip in the water. The aircraft then abruptly veered to the right and crashed.

The passengers and crew were able to evacuate before the aircraft submerged completely. No passenger or crew sustained any injuries and they were rescued and safely taken to Hulhumale' Hospital.

The accident site was secured by MNDF Coast Guard personnel and accident investigation was initiated immediately. The aircraft wreckage was salvaged and brought to a secured place for further investigation on the same day.

The investigation identified the following causal factors:

TBD

Investigation

The accident occurred at 0835 hours. CAA reported the accident to the Accident Investigation Coordination Committee (AICC) at 0850 hours. Three investigators from CAA representing AICC arrived at the accident site at 0935 hours and the investigation commenced immediately.

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:	Beau Del Leasing Inc.
Nationality:	8Q (Maldives)
Registration:	8Q-TMV
Place of Accident:	Velana International Airport, North Right Water Runway
Date and Time:	27 May 2017 @ 0835 hrs LT

1.1 History of Flight.

1.1.1 Aircraft

On the previous day (in the evening) the aircraft underwent non-routine maintenance and was released for flight. There were no deferred defects. Prior to the accident, the aircraft had flown a thirty eight minutes (block time) uneventful sector.

The roundtrip flight, Male'-Rangali-Male' was released with 3 crew members (2 flight crew and 1 cabin crew) and 11 passengers from Male' to Rangali. As per the flight release document, the aircraft was loaded with 304 lbs of baggage and 990 lbs of fuel, with a take-off mass of 11,741 lbs.

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 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 pilots.

The company usually schedules a sequence of flight sectors back to back and issues a combined "flight release" for these flight sectors. On the day of the accident five such sequences of flights

were scheduled for the crew on the same aircraft. The airline “flight release” document contains three parts. These are the operational flight plan, passenger manifest and the baggage manifest.

The PIC was PF for the first sector of the flight. Taxi-out, take-off, cruise and the landing at Rangali were normal, according to the crew. The aircraft landed at Rangali at 0754 hours.

The aircraft took off from Rangali for the second sector of the flight with 3 crew members (2 flight crew and 1 cabin crew) and 9 passengers. As per the flight release (manifest), the aircraft was loaded with 111 lbs of baggage and 670 lbs of fuel, with a take-off mass of 11,117 lbs. The flight duration of this sector was approximately 30 minutes. The PIC taxied the aircraft through the coral area of Rangali lagoon. When clear of the coral area the PIC handed over control of the aircraft to the copilot.

According to the flight crew, no abnormalities were observed throughout the flight. From the take-off at Rangali to approach to land at Velana International airport, and until the first touch down the flight was uneventful. The approach to land was normal.

On touch down, left float first, the aircraft bounced and ballooned then landed on the left float for a second time, and bounced again. Then the aircraft was seen banking excessively to the right digging the right wing tip in the water, making the aircraft veer to the right. Then the aircraft crashed on to the water.

1.1.2 Flight crew

The accident flight was the second flight of the day for both the commander and the first officer. The PIC has been flying DHC-6 aircraft on floats for more than 10 years. The co-pilot has been flying DHC-6 aircraft on floats since January 2017. However, it was the first time both pilots were paired to fly together.

The flight crew reported for duty to TMA base at 0700 hours. As per the day’s schedule, they were assigned the following flights:

1. Male’ - Conrad Rangali - Male’
2. Male’ – Kuramathi – Male’
3. Male’ – LUX Dhidhoo Finolhu– Vilamendhoo – Lily Beach Huvahendhoo – Male’
4. Male’ – Veligandu – Vilureef Meedhufushi– Filitheyo– Male’
5. Male’ – Kuramathi – Male’

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	9	12	NIL
Total	3	9	12	NIL

1.3 Damages to aircraft

The aircraft was substantially damaged due to the impact.

1.4 Other damage:

None.

1.5 Personnel information

1.5.1 PIC –

Age: 60
Nationality: USA
Gender: Male
Type of Licence: Airline Transport Pilot Licence (Aeroplanes)
Licence issued on: 28 February 2016
Licence expires on: 27 February 2018
Type of medical: Class 1
Medical issued on: 08 March 2017
Medical expires on: 8 September 2017
Types flown: DHC-6 (on Maldivian licence)
Hours on type: 12834 hrs
Ratings: DHC-6 Float Plane
Last Proficiency check: 28 February 2017
Total hours as PIC: 12834 hrs
Total flight time: 15991 hrs

1.5.2 Co-pilot –

Age: 28
Nationality: Srilankan
Gender: Male
Type of Licence: Commercial Pilot License (Aeroplanes)
Licence issued on: 30 January 2017
Licence expires on: 29 January 2019

Type of medical:	Class 1
Medical issued on:	30 October 2016
Medical expires on:	30 October 2017
Types flown:	DHC-6
Hours on type:	342.1 hrs
Ratings:	DHC-6 Sea
Last Proficiency check:	25 January 2017
Total flight time:	537.6 hrs

1.5.3 Cabin Crew –

Age:	23
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Cabin Crew Licence
Licence issued on:	30 December 2013
Licence expires on:	29 December 2018
Type of medical:	Cabin crew
Medical issued on:	19 November 2015
Medical expires on:	19 November 2017

1.6 Aircraft information

1.6.1 General information

Manufacturer:	Viking Air (De Havilland)
Registration:	8Q-TMV
Powerplants:	PT6A-27
Manufacturer's serial number:	625
Year of construction:	1979
Airframe hours at time of accident:	57,523.79 hrs
Certificate of Airworthiness:	Normal category, issued on 24 December, 2009
Airworthiness Review Certificate:	Renewed on 11 April, 2017

1.6.2 Aircraft History –

Total flying hours since: -

- manufacture: 57,523.79 hrs (since 27 May 2017)
- last periodic inspection: 73.86 hrs
- last inspection carried out at TAT: 57,449.93 (EMMA #29 inspection c/o on 6 May 2017)

1.6.3 Engines and propellers –

Right Engine (Gas Generator)

Right engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 2008
Model: PT6A-27
Serial number: PCEPG0378
Total Hours since new: 4,521.79 hrs
Last overhaul date: N/A - Engine not yet Overhauled
Hours since overhaul: N/A - Engine not yet Overhauled
Last check carried out: EMMA #29
Hours since last check: 73.86 hrs

Right Engine (Power Section)

Right engine manufacturer: Pratt & Whitney Canada
Year of manufacture: 2008
Model: PT6A-27
Serial number: PG0378-100
Last overhaul date: N/A - Engine not yet overhauled
Hours since overhaul: N/A - Engine not yet overhauled
Last check carried out: EMMA #29
Hours since last check: 73.86 hrs

Left Engine (Gas Generator)

Left engine manufacturer: Pratt & Whitney Canada
Year of manufacture: N/A
Model: PT6A-27
Serial number: PCEPG0176
Total Hours since new: 13,381.59 hrs
Last overhaul date: 19 November 2013
Hours since overhaul: 3,381.59 hrs
Last check carried out: EMMA #29
Hours since last check: 73.86 Hrs

Left Engine (Power Section)

Left engine manufacturer: Pratt & Whitney Canada
Year of manufacture: N/A
Model: PT6A-27
Serial number: PG0176-100
Last overhaul date: 19 November 2013
Hours since overhaul: 3,381.59 hrs
Last check carried out: EMMA #29
Hours since last check: 73.86 hrs

Right Propeller

Manufacturer: Hartzell Propeller Inc
Year of manufacture 1999
Model: HC-B3TN-3D
Serial number: BUA22604
Last overhaul date: 30 June 2015
Hours since last overhaul: 2,266.09 hrs
Last check carried out: EMMA #29

Left Propeller

Manufacturer: Hartzell Propeller Inc
Year of manufacture: N/A
Model: HC-B3TN-3DY
Serial number: BUA28415
Last overhaul date: 10 June 2014
Hours since last overhaul: 02 December 2014
Last check carried out: EMMA #29

1.6.4 Cabin Layout and Configuration

The aircraft was in float configuration with Wipaire 13000S floats installed. The aircraft was configured for 15 passengers plus one cabin attendant with baggage placed near the right rear passenger door and the aft baggage compartment as baggage loading areas. The aircraft had four exits in the cabin and two exits in the cockpit.

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-CON Take Off Weight: 11,741 lbs.

CON-MLE Take Off Weight: 11,117 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) issued on 27th May 2017 at 0800 LT and 0900 LT.

Type and Area	Date & Time in UTC	Weather	Remarks
METAR VRMM	270300Z	25011KT 9999 FEW018 FEW019CB BKN270 30/60 Q1010 CB S NOSIG	Nil
METAR VRMM	270400Z	25012KT 9999 FEW018 BKN270 30/26 Q1010 NOSIG	Nil

1.8 Aids to navigation

The aircraft was operating under VFR.

1.9 Communications

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

1.10 Aerodrome information

Destination Aerodrome: Velana International Airport
Reference: 041153N 0733210E
Facilities: Water RWY NR/SL (North Right /South Left) RWY, NL/SR (North Left / South Right) RWY, and EW (East/West) RWY
Alternate: BIY 198°/16nm, RIH 197°/23.7nm, DHI 184°/13nm, EMF 187°/5nm.

The aircraft landed North Right Water Runway at Velana International Airport.

1.11 Flight Recorders

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

1.12 Wreckage and impact information

1.12.1 Accident site visit

To assist AICC with the investigation CAA inspectors, MPS, MNDF, ARFFS of Velana International Airport were deployed on the accident site soon after the accident occurred.

1.12.2 Salvage operations

The wreckage was salvaged from a depth of approximately 10-11 m (Velana International Airport water runway) on the same day. The salvage operation was jointly accomplished by MNDF and TMA personnel, overseen by the investigators.

1.13 Medical and pathological information

Medical examinations were performed on all crew members and passengers at Hulhumale' Hospital. The crew were tested for alcohol and narcotics drugs with the help of MPS and they were found to be all negative.

The crew held valid aviation medical certificates.

1.14 Fire

There was no report or evidence of fire.

1.15 Survival Aspect

All the passengers and crew had their seat belts fastened during landing. Aircraft was equipped with life jackets for all occupants and none of the occupants complained about not being able to access them. However, only one passenger was found wearing a life jacket who was apparently assisted by the cabin crew in wearing it.

Cabin Attendant, PIC and First Officer collectively initiated evacuation of the occupants immediately after the crash. Left main door located to the rear of the aircraft was used for evacuation.

1.16 Tests and research

Considered not required.

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 holds Aircraft Maintenance Organisation Approval (MCAR-145) 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 investigators.

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: 27th September 2017