بسم الله الرحمن الرحيم

ACCIDENT INVESTIGATION COORDINATING COMMITTEE

AIRCRAFT ACCIDENT REPORT 2017/02

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

on 4th October 2017

Operator: Island Aviation Services 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 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 this investigation, AICC was assisted by the Maldives Civil Aviation Authority (MCAA), Island Aviation Services Limited, the Maldives National Defense Force and the Maldives Police Service.

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 03 January, 2018.

Mr. Abdul Razzak Idris
Chairperson
Accident Investigation Coordinating Committee

TABLE OF CONTENTS

List of Abbreviations

AICC : Accident Investigation Coordinating Committee
ARFF : Airport Rescue & Fire Fighting
COM : Communication
CVR : Cockpit Voice Recorder
DHC-6-300 : Viking Air Twin Otter 300 Series
EW : East West
FDR : Flight Data Recorder
FT : Feet
IASL : Island Aviation Services Limited
Kts : Knots
Lbs : Pounds
LT : Local time
MACL : Maldives Airports Company Limited
MMCAA : Maldives Civil Aviation Authority
MCAR Maldives Civil Aviation Regulations
MLE : Male'
MLF : Maalifushi
MNDF : Maldives National Defence Force
MPS : Maldives Police Service
NIY : Niyaama Private Island
NM : Nautical Mile
NL : North Left
NR : North Right
PF : Pilot Flying
PIC : Pilot in command
PNF : Pilot Not Flying
RWY : Runway
SE : South East
SL : South Left
SR : South Right
TBD : To be determined
UTC : Universal Coordinated Time
VFR : Visual Flight Rules
VHF : Very High Frequency
VRMM : Velana International Airport

Synopsis

On 4th October 2017, a DHC-6 aircraft, registration number 8Q-ISB owned by Aerostar Bravo Limited and operated by Island Aviation Services Limited met with an accident. It was on a scheduled flight from Niyama Private Island to Velana International Airport. The flight was conducted in accordance with the Visual Flight Rules (VFR). There were fifteen passengers, two pilots and one cabin crew on board the aircraft and the first officer was the pilot flying. The accident occurred during landing at Velana International Airport water aerodrome.

The aircraft landed on the North Right Water Runway during a rain shower with a gusting westerly cross wind. The aircraft first touched down on its left float and bounced. The captain initiated a go-around by applying full power with the flaps in the fully extended position. The aircraft was at a very low speed in a nose-high and right-wing-low attitude. The aircraft thereafter touched down on its right float, the right wing tip digging into water. As a result the aircraft started turning right towards the shore. The aircraft continued to turn on a right bank and finally flipped and crashed into the sea upside down facing South. The aircraft sustained substantial damage.

The passengers and crew did not sustain any serious injuries. All passengers evacuated from the aircraft before arrival of the rescue boats. The passengers and crew were safely taken to the ARFF Marine Station and later treated at Hulhumale' Hospital.

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

The investigation identified the following causal factors:
TBD

Investigation

The accident occurred at 1616 hours. The Accident Investigation Coordination Committee (AICC) received the notification soon after. The first investigator from MCAA representing AICC arrived at the accident site at around 1620 hours and the investigation commenced immediately.

1. FACTUAL INFORMATION

Operator:	Island Aviation Services Limited. (Air Operator Certificate No.007)
Aircraft Type:	Viking Air DHC-6-300
Aircraft Manufacturer:	Viking Air Pvt Ltd.
Aircraft Owner:	Aerostar Bravo Limited
Nationality:	8Q (Maldives)
Registration:	8Q-ISB
Place of Accident:	Velana International Airport, Water Runway
Date and Time:	4 October 2017 at 1616 hrs LT

1.1 History of Flight.

1.1.1 Aircraft

The crew arrived at the aircraft (8Q-ISB) and found a defective aft fuel gauge. According to the crew they accepted the aircraft after the defect was rectified. Thereafter a pre-flight check of the aircraft, as per company procedures was carried out and the aircraft was accepted by the crew.

The company usually schedules a series of flight sectors back to back and issues a combined "flight release" for all sectors.

The flight for the roundtrip, Male'-Niyaama-Male', was released with 3 crew members (2 flight crew and 1 cabin crew) and 14 passengers from Male' to Niyaama. As per the flight release document, the aircraft was loaded with 432 lbs of baggage and 950 lbs of fuel, with a take-off mass of 12,494 lbs. The PIC was PF for the first sector of the flight. According to the crew, taxi-out, take-off, cruise and the landing at Niyaama were normal.

The aircraft took off from Niyaama for the second sector of the flight with the same crew and 15 passengers. As per the flight release (manifest), the aircraft was loaded with 468 lbs of baggage and 840 lbs of fuel, with a take-off mass of 12,499 lbs. The flight duration of this sector was estimated to be 47 minutes. According to the crew, PIC taxied and did the take-off from Niyaama as the winds were observed around 15kts, with rough sea conditions. After the aircraft was airborne, passing 1000 ft, the captain handed over the controls to the co-pilot to continue the rest of the flight to Velana International Airport.

According to the flight crew, no mulfunctions on the aircraft were observed throughout the flight. As the aircraft approached Velana International Aiport, both the captain and the co-pilot noticed inclement weather

approaching from the west. On initial contact with Male' Tower (20NM from the field) the Captain (PNF) reported that the aircraft was on descent through 800ft and requested to fly direct to "Delta" (reporting point at 6 NM SE of the field) to avoid the approaching weather.

From "Delta" the aircraft joined right base to North Right (NR) Water Runwayat an altitude of 500 ft as instructed by the Tower. There was light rain and the winds were picking up due to the approaching weather. According to the crew, at 300ft the aircraft was configured for landing with full flaps and propeller levers at the full forward position. Wind shield wipers were turned on due to the light rain.

From the take-off at Niyaama to approach and until the first touch down at Velana International Airport, the flight was uneventful.

According to the information given by the tower, the wind direction was Westerly at approximately 12 kts. The instantaneous wind velocity at touch down could not be verified as the wind was fast picking up with the approaching weather.

According to available video footages the visibility was also deteriorating when the aircraft approached to land. Right after the aircraft first contacted water, the visibility briefly dropped to near zero due to heavy rain.

Figure 1: 8Q-ISB aircraft final approach path to RWY NR

The aircraft touched down in the intended landing area (Figure 1), on the left float first and bounced, then contacted the water a second time on the right float. The co-pilot reduced power by pulling the power levers back. At the same time, as stated by the Captain, he placed his right hand on the power levers (over the co-pilot's left hand) and pushed the power levers fully forward, applying full power with the intention of going around whilst calling "Max

power". The Captain neither announced that he was taking over control, nor called for flaps 10°, as per the procedures. There was no response from the co-pilot in handing over of controls to the Captain.

The aircraft banked sharply to the right, turning right and crashed. The aircraft finally flipped over and halted upside down facing South and was partly submerged. (Figure 2).

Figure 2: The aircraft wreckage

All passengers and crew evacuated to safety through the right hand emergency exit, which was above the water. The rescue teams were at the accident site almost immediately and assisted the passengers taking them to the hospital as well as attending to their welfare. There was no fire, although a considerable amount of fuel was spilled.

1.1.2 Flight crew

Records indicate that the flight crew members were certified and qualified for the flight in accordance with existing regulations.

The captain held an Airline Transport Pilot's licence (ATPL) and was rated for single and multi-engine land and sea operations. The captain's instrument rating was valid until 31st May 2018, and his Class 1 medical was valid until 10th September 2018. Initial training on the DHC-6 aircraft was completed on 19 February 2007. The last licence proficiency check (LPC) was done on 28th May 2017. During the course of the training, the pilot was able to successfully demonstrate approach to stall, recognition and recovery from the following configurations: clean, full flaps at approach, while in a turn, go-around (balked landing) with maximum landing flaps.

The Co-pilot held a CPL and was rated for single-engine land and multi-engine sea operations. The Co-pilot does not have an instrument rating endorsed, which is not required for DHC-6 VFR operations as per the existing regulations. Initial type rating training on DHC-6 on floats began in December 2016 and was completed in June 2017. This initial type rating training consisted of a total of 31 hours. Initial PPC on the DHC-6 was completed on 7th June 2017 and he was undergoing line flying under supervision when the accident occured. During the course of the training the pilot was able to successfully demonstrate approach to stall, recognition and recovery from the following configurations: clean, full flaps at approach, while in a turn, go-around (balked landing) with maximum landing flaps.

The flight crew reported for duty on 4th October 2017 to IASL base at 1230 hours for a scheduled flight at 1330 hours. As per the day's schedule, they were assigned a MLE – NIY – MLE and a MLE – MLF flights only.

1.2 Injury to persons

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

1.3 Damages to aircraft

The aircraft was substantially damaged.

1.4 Other damage:

None.

1.5 Personnel information

1.5.1 PIC –

Age:	45
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Airline Transport Pilot Licence (Aeroplanes)
Licence issued on:	24 April 2017
Licence expires on:	23 April 2019
Type of medical:	Class 1
Medical issued on:	11th September 2017
Medical expires on:	10th September 2018
Types flown:	DHC-6 (on Maldivian licence)
Hours on type:	9233 hrs
Ratings:	DHC-6 Sea
Last Proficiency check:	28th May 2017
Total hours as PIC:	5934:50 hrs
Total flight time:	9449:70 hrs

1.5.2 Co-pilot –

Age:	31
Nationality:	Maldives
Gender:	Male
Type of Licence:	Commercial Pilot License (Aeroplanes)
Licence issued on:	14 July 2016
Licence expires on:	13 July 2018
Type of medical:	Class 1
Medical issued on:	15 October 2016
Medical expires on:	14 October 2017
Types flown:	DHC-6
Hours on type:	93:15 hrs
Ratings:	DHC-6 Sea
Last Proficiency check:	7 June 2017
Total flight time:	261:20 hrs

1.5.3 Cabin Crew –

Age:	22
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Cabin Crew Licence
Licence issued on:	11 March 2015
Licence expires on:	10 March 2020
Type of medical:	Cabin crew
Medical issued on:	4 October 2016
Medical expires on:	4 October 2018

1.6 Aircraft information

1.6.1 General information

Manufacturer:	Viking Air (De Havilland)
Registration:	8Q-ISB
Powerplants:	PT6A-27
Manufacturer's serial number:	655
Year of construction:	1,979
Airframe hours at time of accident:	26,314.52 hrs
Certificate of Airworthiness:	Normal category, issued on 26 October 2016
Airworthiness Review Certificate:	Initial Issue, issued on 26 October 2016

1.6.2 Aircraft History –

Total flying hours since: -

- manufacture: 26314.52 hrs (since)
- last periodic inspection: 80.18 hrs
- last inspection carried out at
  TAT: 26234.34 (EMMA #09 inspection c/o on 13 September 2017)

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:	PCE-P50822
Total Hours since new:	11,914.22 hrs
Last overhaul date:	28 July 2015
Hours since overhaul:	1121.28 hrs
Last check carried out:	EMMA #09
Hours since last check:	80.18 hrs

Right Engine (Power Section)

Right engine manufacturer:	Pratt & Whitney Canada
Year of manufacture:	1975
Model:	PT6A-27
Serial number:	P50822-100
Last overhaul date:	28 July 2015
Hours since overhaul:	1121.28 hrs
Last check carried out:	EMMA #09
Hours since last check:	80.18 hrs

Left Engine (Gas Generator)

Left engine manufacturer:	Pratt & Whitney Canada
Year of manufacture:	1975
Model:	PT6A-27
Serial number:	PCE-P41129
Total Hours since new:	22830.40 hrs
Last overhaul date:	25 February 2014
Hours since overhaul:	1124.34 hrs
Last check carried out:	EMMA #09
Hours since last check:	80.18 hrs

Left Engine (Power Section)

Left engine manufacturer:	Pratt & Whitney Canada
Year of manufacture:	1975
Model:	PT6A-27
Serial number:	P41129-100
Last overhaul date:	25 February 2014
Hours since overhaul:	1124.34 hrs
Last check carried out:	EMMA #09
Hours since last check:	80.18 hrs

Right Propeller

Manufacturer:	Hartzell Propeller Inc
Year of manufacture	1998
Model:	HC-B3TN-3DY
Serial number:	BUA21567
Last overhaul date:	12 June 2014
Hours since last overhaul:	1124.34 hrs
Last check carried out:	EMMA #09

Left Propeller

Manufacturer:	Hartzell Propeller Inc
Year of manufacture:	2001
Model:	HC-B3TN-3DY
Serial number:	BUA24754
Last overhaul date:	19 December 2013
Hours since last overhaul:	1124.34 hrs
Last check carried out:	EMMA #09

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 and one cabin attendant. The right rear passenger door area and the aft baggage compartment were designated baggage loading areas. The aircraft had four exits in the cabin and two in the cockpit. But the aircraft was approved to use the rear (left) main door, two window exits and two cockpit doors as emergency exits.

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-NIY Take Off Weight: 12,494 lbs.
NIY-MLE Take Off Weight: 12,499 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 Operatons Manual.

1.7 Meteorological information

Meteorological information of Male' (VRMM) issued on 4th October 2017 at 16:00 LT.

Date & Time in LT	Avg Wind Speed		Temperature	Dew Point	Pressure	Rainfall
	Knots	Dir	°C	%	hPa	mm
4.10.2017 16:00	16	280	28	95	1005	10.3

1.8 Aids to navigation

N/A. 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

Velana International Airport water aerodrome is under MACL. The aerodrome has 3 water runways; North Right (NR)/South Left (SL), North Left (NL)/South Right (SR), and East/West (EW). All the runways and taxi ways are marked with buoys.

1.11 Flight Recorders

The aircraft was not equipped with a flight data recorder (FDR) or a 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 MCAA inspectors, MPS, MNDF, ARFFS of Velana International Airport were deployed on the accident site soon after the accident occurred.

1.12.2 Investigation was initiated immediately after the wreckage was secured by the MNDF and MPS. Available evidence was collected of the wreckage and the details recorded whilst part of the aircraft was still under water. Aircraft was found substantially damaged.

1.12.3 Salvage operations

The wreckage was salvaged from Velana Internationl Airport water runway on the same day. The salvage operation was jointly accomplished by MNDF and IASL personnel, overseen by the investigators.

1.13 Medical and pathological information

Medical examinations were performed on all passengers at Hulhumale' Hospital. The crew were tested for alcohol and narcotic 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.

Cabin Attendent and First Officer collectively initiated the evacuation of the passengers immediately after the crash. The right hand window emergency exit was used for the evacuation.

1.16 Tests and research

Considered not required.

1.17 Organizational and management information

Island Aviation Services Ltd (IASL) is a Maldives Civil Aviation Authority (MCAA) approved Air Operator . IASL provides international and domestic air services with a fleet of A320/321, DHC-8 and DHC-6 float aircraft. The company is authorised to conduct scheduled IFR and non-scheduled day VFR Operations.

Regular inspections and periodical flight checks were conducted on the operation and crew by the MCAA to verify compliance and competency. The company also holds an Aircraft Maintenance Organisation Approval. Annual audits with random spot checks and regular Airworthiness Review Inspections were carried out by the MCAA.

1.18 Additional Information

AICC investigation team analysed the evidence available. All flight crew, some passengers involved in this accident 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 ICAO Doc 9756 and 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: 3rd January 2018