

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



ACCIDENT INVESTIGATION COORDINATING COMMITTEE

**ACCIDENT REPORT ON
8Q-TMK (TWIN OTTER)
At the Ibrahim Nasir International Airport, Water Runway,
Maldives
On 2nd August 2013**

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

INTRODUCTION

Maldives is a signatory to Convention on International Civil Aviation (Chicago 1944) which established the International Civil Aviation Organisation. Article 26 of the Chicago Convention obligates the conduct of accident investigation of civil aircraft occurring in their state.

The Accident Investigation Coordinating Committee (AICC) conducted the investigation.

The AICC was assisted by technical staff of Maldives Civil Aviation Authority (MCAA).

In accordance with Annex 13 to Convention on International Civil Aviation, it is not the purpose of this investigation to apportion blame or liability. The sole objective of this investigation and the Final Report is to prevent accidents and incidents.

Unless otherwise stated recommendations in this report are addressed to the MCAA. It is MCAA 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 27th May 2015.



Mr. Abdul Razzak Idris

Chairperson

Accident Investigation Coordinating Committee



CONTENTS

List of Abbreviations

Synopsis

- 1. FACTUAL INFORMATION**
 - 1.1 History of Flight**
 - 1.2 Injury to persons**
 - 1.3 Damages to aircraft**
 - 1.4 Other damage**
 - 1.5 Personnel information**
 - 1.6 Aircraft information**
 - 1.7 Meteorological information**
 - 1.8 Aids to navigation**
 - 1.9 Communications**
 - 1.10 Aerodrome information**
 - 1.11 Flight Recorders**
 - 1.12 Wreckage and impact information**
 - 1.13 Medical and pathological information**
 - 1.14 Fire**
 - 1.15 Survival Aspects**
 - 1.16 Tests and research**
 - 1.17 Organizational and management information**
 - 1.18 Additional Information**
 - 1.19 Useful or Effective Investigation Techniques**
- 2. ANALYSIS**
- 3. CONCLUSIONS**
- 4. SAFETY RECOMMENDATIONS**
- 5. APPENDICES**

List of Abbreviations

AICC	:	Accident Investigation Coordinating Committee
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of renewal
MCAA	:	Maldives Civil Aviation Authority
CAR	:	Civil Aviation Regulation
CVR	:	Cockpit Voice Recorder
ICAO	:	International Civil Aviation Organization
LH	:	Left hand
LT	:	Local time
MAR	:	Maldivian Airworthiness Requirements
TMA	:	Trans Maldivian Airways Pvt. Ltd
MCAR	:	Maldivian Civil Aviation Regulation
MEL	:	Minimum Equipment List
MTOW	:	Maximum takeoff weight
PIC	:	Pilot in command
PROP	:	Propeller
RH	:	Right hand
SIC	:	Second in command
VFR	:	Visual Flight Rules

Synopsis

On 2nd August 2013 TMA flight 263031 (aircraft registration number 8Q-TMK) was en-route Kuramathi to Male from a round trip Male' – Velidhoo – Veligandu – Kuramathi – Male'. The crew departed from Male' to Velidhoo at 0635 hrs.

After picking up all the passengers from Velidhoo, Veligandu, and Kuramathi resorts, the crew departed from Kuramathi to Male' at 0800 hrs with 11 passengers (i.e. 11696 pounds take-off weight). The aircraft took off from Kuramathi and flew to Thila (waypoint) at 1000ft.

At thila, the crew were instructed by ATC to join a left downwind for South bound left from South of the field. Since the winds were from the west the crew requested and got approval to join final for west bound. The Air Traffic Controller cleared the flight to land and the aircraft approached to land.

According to the co-pilot's report, she noticed the aircraft turn to the left as she was approaching to land. During landing the left float touched down first and when she felt that she did not have the control of the aircraft, gave control to the Captain immediately.

The Captain reported that by the time he took over the controls the aircraft had turned almost 90 degrees to the left and that he had a notion that the left wing tip had touched the water during landing. The left aileron and left out board fore-flap were found damaged.

The captain then taxied the aircraft to dock and disembarked all the passengers. No injuries to any person were reported.

The investigation identified the following causal factors:

The aircraft was in a left bank on approach and continued to touch down with the same attitude while there was no apparent reason for the banking because the aircraft was approaching to land with a headwind.

1. FACTUAL INFORMATION

Operator:	Maldivian Air Taxi Pvt Ltd. (Maldivian Air Operator Certificate Holder No.005)
Aircraft Type:	DHC-6-300 (on Wipline floats)
Aircraft Manufacturer:	De Havilland
Aircraft Owner:	Ashe Aircraft Enterprises Ltd.
Nationality:	Maldivian registered
Registration:	8Q-TMK
Place of Accident:	Ibrahim Nasir International Airport, West Bound Water Runway
Date and Time:	2 nd August 2013 0815 hrs.

1.1 History of Flight.

On 2nd August 2013 at about 0815 hours LT, TMA aircraft 8Q-TMK's left wing tip touched the water while landing. There were 11 passengers on board in addition to the 3 crew members and none were injured.

On the day of the accident, the crew set reported for duty at 0545 (reportedly on the 0515 ferry) for a 0615 EDT departure to Velidhoo. TMA flight 263031 (registration number 8Q-TMK) was en-route Kuramathi to Male from a round trip Male' – Velidhoo – Veligandu – Kuramathi – Male'. The crew departed from Male' to Velidhoo at 0635.

After picking up all the passengers from Velidhoo, Veligandu, and Kuramathi resorts, the crew departed from Kuramathi to Male' at 0800 hours with 11 passengers. It was a 13 minute flight from Kuramathi to Male' and this was the aircraft's and the crew's fourth sector of the day.

The captain and co-pilot were taking alternate turns for the sectors of the trip and on the final leg of the trip Kuramathi - Male' sector, the First Officer was the pilot flying. After taking off from Kuramathi and reporting at way point "Thila", the crew were instructed by ATC to join a left downwind for South bound left from South of the field. Since the winds were from the west the crew requested and got approval to join final for west bound. The Air Traffic Controller cleared the flight to land and the aircraft approached to land. The crew reported that the approach was normal, within the speed limits and did the final landing checks before 300 ft.

According to the co-pilot's report, she noticed the aircraft turn to the left as she was approaching to land. During landing the left float touched down first and she felt that she did not have the control of the aircraft; hence she gave control to the Captain immediately.

The Captain reported that by the time he took over the controls the aircraft had turned almost 90 degrees to the left and that he had a notion that the left wing tip had touched the water during landing.

The captain then taxied the aircraft to dock and disembarked all the passengers. No injuries to any person were reported, however the left aileron and left out board fore-flap of the aircraft were found damaged.

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

During the initial assessment the following parts were found with major damages: (Appendix 1)
(Refer to MCAR 21.A.435)

1. LH Wing Tip
2. LH Aileron
3. LH out board fore-flap.

Minor damages were observed on the floats and fuselage (NB: Float damage may not be directly related to the incident).

1.4 Other damage

NIL

1.5 Personnel information

1.5.1 Captain –

Age:	32
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Commercial Pilot Licence (Aeroplanes)
Medical issued on:	22 December 2012
Medical expires on:	31 December 2013 2012
Type of medical:	Class 1
Licence issued on:	1 January 2013
Licence expires on:	28 January 2015
Types flown:	DHC-6 (on Maldivian licence)
Hours on type:	3500 hrs
Ratings:	DHC-6 Float Plane
Last Proficiency check:	18 January 2013
Total hours as PIC:	433hrs (All types)
Total flight time:	3741hrs

1.5.2 Co-pilot –

Age:	31
Nationality:	Maldivian
Gender:	Female
Type of Licence:	Commercial Pilot Licence (Aeroplanes)
Medical issued on:	01 August 2013
Medical expires on:	31 August 2014
Type of medical:	Class 1
Licence issued on:	3 October 2011
Licence expires on:	2 October 2013
Types flown:	DHC-6 (on Maldivian Licence)
Hours on type:	2800 hrs
Ratings:	DHC-6 Float Plane
Last Proficiency check:	13 January 2013
Total hours as SIC:	2761 hrs
Total flight time:	3055 hrs

1.5.3 Cabin Crew –

Age:	36
Nationality:	Maldivian
Gender:	Male
Licence issued on:	10 November 2008
Licence expires on:	10 November 2013
Medical issued on:	29 August 2012
Medical expires on:	31 August 2014
Type of medical:	Class 3

1.6 Aircraft information

1.6.1 General information –

Aircraft manufacturer:	Viking Air (De-Havilland), Canada
Model:	DHC-6-200 Twin Otter
Serial number:	234
Year of manufacture:	1969
Nationality:	Maldivian
Registration marks:	8Q-TMK
Validity of C of R:	08 July 2004
Validity of C of A:	21 February 2009 (Perpetual ARC Issued)
ARC Expiry:	20 February 2014
Name of owner:	Ashe Aircraft Enterprises Ltd.
Name of operator:	Maldivian Air Taxi Pvt. Ltd.

1.6.2 Aircraft History –

Total flying hours since: -	
- manufacture:	37052.9 hrs
- last periodic inspection:	Emma 34
- last inspection carried out at	
TAT:	36983.7 hrs
TAC:	85996 cycle
Date:	16 July 2013
- Next inspection due at	
TAT:	37108.7 hrs

1.6.3 Engines and propellers –

Right engine:

Manufacturer: Pratt & Whitney (Canada)
Year of manufacture: UNK
Model: PT6A-27
Serial number: PCE42198
Last overhaul date: 14 August 2014
Hours since overhaul: 1045.5 hrs
Last check carried out: EMMA #34

Left engine:

Manufacturer: Pratt & Whitney (Canada)
Year of manufacture: UNK
Model: PT6A-27
Serial number: PCE-PE0526
Total Hours since new: 2068.6 hrs
Hours since overhaul: Not Overhauled
Last check carried out: EMMA #34

1.6.4 Fuel – Type of fuel used: Jet A1

1.6.5 Accessories – No Component failed.

1.6.6 Defects – No deferrals.

1.6.7 Aircraft load – 11,696 lbs.

1.6.7.1 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 and is attached with this report. (Appendix 2)

1.7 Meteorological information

Meteorological information received from TMA are as follows:

1. Time of observation 0300UTC (0800 LT).
2. Surface wind direction 250deg. Speed 11 knots Visibility 9km.
3. Condition: Slight rain, cloud: scattered 1600ft, Few CB 1700ft, broken 10,000feet.
4. Temp 26, dew point 24, QNH 1011.
5. CB E, SE, S, SW, Temporary change surface wind speed 250deg, speed 22knots, and gusting 40knots.
6. Visibility 1000m.

The actual report issued from the meteorological department was not available.

1.8 Aids to navigation

The aircraft was operating under VFR condition. Navigational aids were not a contributing factor of the accident.

1.9 Communications

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

1.10 Aerodrome information

Water aerodrome is being monitored by INIA operator. And consist of 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.

At the time of the accident the aircraft landed on the west bound water runway (Appendix 3). The runway was clear and the runway conditions were normal – no known runway condition that contributed to the accident.

1.11 Flight Recorders

The aircraft was not fitted with any flight recorders and none was required by the regulation.

1.12 Wreckage and impact information

The physical evidence and the CCTV footage showed that the wing tip dug into the water on landing. The CCTV footage also shows that the aircraft started to roll to the left side as it was approaching to land. At the time of landing, the left wing tip could be seen digging into water with a splash then the left float touched down and the aircraft turning rapidly to the left. The aircraft turned 90 degrees abruptly with the inertia of the left wing and the aircraft rolled back to normal position and stabilised.

The aircraft was taxied to the dock where detailed examination of the damages was carried out by the TMA engineering team. The left wing tip, left aileron and left out board fore-flap of the aircraft were found damaged.

1.13 Medical and pathological information

Medical examinations were performed on the flight crew by the operator. There was no evidence of any pre-existing alcohol, drugs or any toxic substance in either of the pilots. No physical injuries to passengers and crew were recorded.

1.14 Fire

There was no evidence of fire before or after impact.

1.15 Survival Aspect

Aircraft came to a halt on north right water runway. The passengers were evacuated under instructions and guidance by the crew and the rescue team from MAT.

1.16 Tests and research

No further tests were conducted on any equipment as the crew did not report any aircraft malfunctioning at any stage of the flight.

1.17 Organizational and management information

The company is a Maldives Civil Aviation Authority (MCAA) approved Air Operator Certificate holder. Regular inspections and periodical flight checks were conducted on the company and crew respectively by MCAA to verify compliance and competency.

The company also hold MCAR-145 approval and annual audits are being carried out by MCAA inspectors in addition to random spot checks and regular Airworthiness Review inspection of TMA fleet.

1.18 Additional Information

Photographic evidence was collected and CCTV footage from TMA terminal building also collected. CAA investigation team and TMA internal investigation team analysed the evidence available. All flight crew involved in this incident and key eyewitnesses were interviewed by the operator.

1.19 Useful or Effective Investigation Techniques

None

2. ANALYSIS

The CCTV footage, crew statement and photographs of the damages were available to the investigators to analyse the situation and determine what caused the preceding events.

3. CONCLUSIONS

(a) Findings

- In regard to licensing and qualification, Flight crew were in compliance with the regulations.
- Flight and duty time limitations of the flight crew were in accordance with MCAR OPS-1, Subpart Q.
- None of the flight crew previously had a record of a similar incident/accident.
- By analyzing the CCTV video footage, it is evident that the aircraft had a bank to the left on approach and continued to touch down in the same attitude.
- The crew report (statement), shows that after touch down the flight controls were given to the Captain as the co-pilot felt she did not have control over the aircraft and she did not realize that the left wing tip had touched the water during landing.
- The aircraft was within the certified weight limitations for both take-off and landing.
- The aircraft was released serviceable.

(b) Causal Factors

The aircraft was in a left bank on approach and continued to touch down with the same attitude while there was no apparent reason for the banking because the aircraft was approaching to land with a headwind.

4. RECOMMENDATIONS

Recommendation 4.1

Float operators to review training procedures, specially approach and landing phases.

Recommendation 4.2

Monitoring of line flying by the operator to ascertain consistency with training.

Report compiled by:
Accident Investigation Coordinating Committee
Date: 27th May 2015

5. APPENDICES

Appendix 1



Left Wing



Left Aileron and Fore Flap

Appendix 2

OPERATIONAL FLIGHT PLAN - DAY / VFR					MAT FLIGHT RELEASE				
02-Aug-13	8:07	FLT263031	BQ-TMK	8549	12.8	12500	KTAS 135		
SECTOR	MLE-VDU	VDU-VLG	VLG-KMT	KMT-MLE					
SKED	615	652	715	733					
ETE	22	8	3	16					
MAG BRG	274	066	065	106					
DIST (nm)	43	13	1	31					
OFF BLOCK	0630	0710	0725	0756					
TAKE OFF	0635	0714	0742	0800					
LAND	0700	0724	0747	0813					
ON BLOCK	0703	0727	0748	0819					
AIR TIME	25	10	05	13					
BLOCK TIME	33	17	13	23					
BOARDING	8(2)+0	*2(0)+0	*2(0)+0	**7(0)+0					
TOT ON BOARD	8(2)+0	4(2)+0	4(0)+0	11(0)+0					
DISSEMBARKING	4(0)+0	2(2)+0	0(0)+0	11(0)+0					
A/C APS	8549	8549	8549	8549					
PAX	944	717	678	1,845					
BAGGAGE	180	130	222	592					
FUEL @ T/O	1,190	920	790	710					
+/- FUEL	200	0	0	0					
MAN AJUST	0	0	0	0					
T/O MASS	10,863	10,316	10,239	11,696					
MAN AJUST	0	0	0	0					
SECTOR BURN	270	130	80	210					
LDG MASS	10,593	10,186	10,159	11,486					
TOTAL BURN	270	400	480	690					
MIN FUEL REQ	990	720	590	510					
C of G INDEX	12.5	12.9	12.4	13.0					

Tides			
02/08/2013		03/08/2013	
Time	Tide	Time	Tide
03:15	0.2		
11:06	0.7		
17:17	0.5		
21:45	0.6		

RECALCULATIONS				
A/C APS	8549	8549	8549	8549
PAX				
FUEL @ T/O				
BAGGAGE				
T/O MASS				
SECTOR BURN				
LND MASS				
C of G INDEX				

Sunset/Grounding			
	02.08.2013	03.08.2013	
TWL From	5.41	5.41	
Sunrise	6.02	6.02	
Sunset	18.23	18.23	
Grounding	18.43	18.43	
TWL to	18.43	18.43	

This aircraft is loaded in accordance with MCAR Ops 1.605 for the above flight.

Captains Signature

Flight Dispatchers Signature

BUMPED / ADDITIONAL BAGGAGE / VIP/ RESORT DHONI INFORMATION

DELAY / OUTSTATION DEFECT REPORT

Load Sheet

Appendix 3



Water Aerodrome, Ibrahim Nasir International Airport