

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



ACCIDENT INVESTIGATION COORDINATING COMMITTEE

**ACCIDENT REPORT ON
8Q-MAT (TWIN OTTER)
At the Ibrahim Nasir International Airport, Water Runway,
Maldives
On 09th February 2012**

Operator: Maldivian Air Taxi
Manufacturer: De Havilland (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).

The Accident was notified to MCAA at 1215 hrs (LT) by Maldivian Air Taxi. ICAO and Transport Canada was notified by MCAA. The accident investigating coordinating committee reached the accident site at 1330 hrs.

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 24th February 2015.



Mr. Abdul Razzak Idris
Chairperson
Accident Investigation Coordinating Committee

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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
MAT	:	Maldivian Air Taxi 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

The 8Q-MAT aircraft departed at 1000hrs from INIA water aerodrome (MLE), to Moofushi Resort (MOO), next to Thundufushi Resort (THU), to Centara (CEN) and back to MLE. With rough and heavy seas, the leg to CEN was diverted to Lily Beach Resort (LIL). After passengers were brought from Centara Resort through other means the crew (2 pilot and 1 cabin crew) departed with 9 passengers from LIL to MLE. The accident happened on the sector LIL to MLE. The Co-pilot was the pilot flying this sector.

During final approach, there was a drizzle, good visibility and wind from easterly direction. The pilot flying made a right bank to correct cross wind and did a hard landing on north right water runway. During landing the right float dug into the water and the aircraft bounced. At that time PIC took over the control turning the aircraft left. The aircraft landed on left float and came to a complete stop. The accident resulted in right float being detached and got stuck under the fuselage. Which eventually prevented the aircraft from sinking. Left float was also detached from the steps. All the passengers and crew were able to evacuate the aircraft and there were no fatalities.

The investigation identified the following causal factors:

- Altitude judgement in visual approach
- Excessive wind corrections applied to the prevailing condition.

1. FACTUAL INFORMATION

Operator:	Maldivian Air Taxi Pvt Ltd. (Maldivian Air Operator Certificate Holder No.005)
Aircraft Type:	DHC-6-300
Aircraft Manufacturer:	De Havilland
Aircraft Owner:	Maldivian Air Taxi Pvt Ltd.
Nationality:	Maldivian registered
Registration:	8Q-MAT
Place of Accident:	Ibrahim Nasir International Airport, North Right Water Runway (04° 11' 39.26" N, 073° 32' 08.90" E)
Date and Time:	09 th February 2012 at 1210 hrs.

1.1 History of Flight.

8Q-MAT aircraft departed at 10:01hrs from Ibrahim Nasir International Airport (INIA) water aerodrome on a routine trip, from MLE to MOO then THU followed CEN and back to MLE, with 03 crew and 04 passengers on board. The sky was overcast with rain showers on and off the airfield. Surface wind at INIA water aerodrome was 100 degrees at 10 knots, with visibility at 6km.

The flight was uneventful until landing at CEN landing area; it was not possible to land due to rough and heavy seas. The captain decided to land at LIL landing area and wait for the passengers from CEN. After acquiring the passengers from CEN the aircraft took-off from LIL. This leg from LIL to MLE was flown by SIC.

8Q-MAT was on final approach to MLE, the sky was overcast and visibility was at 6km and there was slight drizzle over the field. Before the aircraft touched down on water the pilot flying applied left rudder and right aileron to correct for the prevailing crosswind. On touchdown the right float touched down first and the float dug into the water and then the aircraft bounced. The captain took over the controls and tried to apply power. The aircraft being airborne appeared to roll slightly more right sideways and landed down very hard with a turn to the right attitude. On impact the right float detached and the right wing slid into water. The detached float got stuck between the right wing and the fuselage preventing further sliding of the wing into water and the aircraft drifted into the shallows.

As the aircraft came to a halt evacuation procedures were followed with the assistance of Airport Rescue and Fire Fighting (ARFF) and MAT Rescue Boats. All 09 passengers and 03 crew were evacuated safely without any injuries.

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

Fuselage:

L/H side skin had a gaping hole right below the door of the captain door. Fuselage Station: 83.00 (Appendix 1)

R/H side skin and structure damage under the belly by the right hand cabin door. Belly skin, stringers and bulkhead was damaged. Between Fuselage Stations: 312.50 & 347.00 (Appendix 2) (Appendix 3)

R/H passenger door step strut attaching nut plates ripped out. Fuselage Station: 300.00 & 312.00 (Appendix 4)

R/H side skin had a gaping hole right below the door of the co-pilot door. Fuselage Station: 83.00 (Appendix 5)

Right Hand Wing and Flying control:

Leading edge skin, lower forward skin, adjacent stringers & rib bent & buckled, Leading edge skin & forward skin under the wing was damaged. Between Wings station 135.00 & 147.00 (Appendix 6) (Appendix 7)

Inboard trailing edge flap and trailing edge skin was damaged. Between Wings station 97.50 & 122.50 (Appendix 8)

Several dents were on aileron trailing edge skin. (Appendix 9)

Right hand Float:

RH Float was twisted and detached from the aircraft. Forward strut attaching point and adjacent support structure bulkhead was badly damaged, fittings and supporting structure parts needs to be replaced. (Appendix 10)

Main strut and aft spreader bar mounting fitting at bulkhead bent. (Appendix 11) (Appendix 12)

Left hand Float:

Forward strut attaching point and adjacent support structure bulkhead was badly damaged, fittings and supporting structure parts needs to be replaced. (Appendix 13)

1.4 Other damage

NIL

1.5 Personnel information

1.5.1 Captain –

Age:	32
Nationality:	Canadian
Gender:	Male
Type of Licence:	Airline Transport Pilot Licence (Aeroplanes)
Medical issued on:	18 October 2011
Medical expires on:	31 October 2012
Type of medical:	Class 1
Licence issued on:	11 August 2011
Licence expires on:	10 August 2013
Types flown:	DHC-6 (on Maldivian licence)
Hours on type:	1650 hrs
Ratings:	DHC-6 Float Plane
Last Proficiency check:	02 February 2012
Total hours as PIC:	2950hrs (All types) 450hrs (DHC-6 Float plane)
Total flight time:	4150hrs

1.5.2 Co-pilot –

Age:	30
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Commercial Pilot Licence (Aeroplanes)
Medical issued on:	01 February 2012
Medical expires on:	01 September 2012
Type of medical:	Class 1
Licence issued on:	21 April 2011
Licence expires on:	20 April 2013
Types flown:	DHC-6 (on Maldivian Licence)
Hours on type:	561.10hrs
Ratings:	DHC-6 Float Plane
Last Proficiency check:	30 September 2011
Total hours as SIC:	561.10hrs
Total flight time:	1063.5hrs

1.5.3 Cabin Crew –

Age:	19
Nationality:	Maldivian
Gender:	Male
Licence issued on:	25 October 2011
Medical issued on:	22 October 2011
Medical expires on:	01 November 2011
Type of medical:	Class 3

1.6 Aircraft information

1.6.1 General information –

Aircraft manufacturer:	De-Havilland of Canada
Model:	DHC-6-200 Twin Otter
Serial number:	146
Year of manufacture:	July 1968
Nationality:	Maldivian
Registration marks:	8Q-MAT
Validity of C of R:	19 November 2006 (Perpetual)
Validity of C of A:	20 Nov 2009 (Perpetual ARC Issued)
ARC Expiry:	25 Sep 2012
Name of owner:	Maldivian Air Taxi
Name of operator:	Maldivian Air Taxi

1.6.2 Aircraft History –

Total flying hours since: -	
- manufacture:	33136.6hrs
- last periodic inspection:	Emma 41
- last inspection carried out at TAT:	33043.7hrs

1.6.3 Engines and propellers –

Right engine:

Manufacturer:	Pratt & Whitney (Canada)
Year of manufacture:	Not available
Model:	PT6A-27
Serial number:	PCE-PG0094
Last overhaul date:	Not overhauled (Monitored On-Condition)
Hours since overhaul:	9314.5 hrs
Last check carried out:	EMMA #41
Hours since last check:	92.9 hrs

Left engine:

Manufacturer:	Pratt & Whitney (Canada)
Year of manufacture:	Not available
Model:	PT6A-27
Serial number:	Not Available
Total Hours since new:	5821.9hrs
Last overhaul date:	Not Available
Hours since overhaul:	Not Overhauled
Last check carried out:	EMMA #41
Hours since last check:	92.9 hrs

Right propeller:

Manufacturer:	Hartzell Propellers Inc
Year of manufacture:	Not available
Model:	HC-B3TN-3DY
Serial number:	BUA21546
Last overhaul date:	Not available
Hours since overhaul:	1562.7hrs
Last check carried out:	EMMA#41

Left propeller:

Manufacturer:	Hartzell Propellers Inc
Year of manufacture:	Not available
Model:	HC-B3TN-3DY
Serial number:	BUA25021
Last overhaul date:	Not available
Hours since overhaul:	2578.5 hrs
Last check carried out:	EMMA#41

1.6.4 Fuel –

Type of fuel used:	Jet A1
Amount of fuel on board:	725 lbs

1.6.5 Accessories – No Component failed.

1.6.6 Defects – No deferrals.

1.6.7 Aircraft load – 11,241 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 14)

1.7 Meteorological information

The meteorological condition in and around INIA, according to the meteorological department observed at 12:10 Hrs local time was as follows:

- Wind 090/12 KT,
- Visibility 06Km,
- Clouds scattered at 2200 ft.
- Overcast at 10,000 ft.
- Temperature 26 deg C,
- Dew point 25 deg C,
- QNH 1010 Mb.
- Rain showers in and around the airfield.

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.

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 north right water runway (Appendix 15).

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

On impact the right float detached and the right wing slid into water. The detached float got stuck between the right wing and the fuselage preventing further sliding of the wing into water and the aircraft drifted into the shallows.

1.13 Medical and pathological information

Medical examinations were performed on all the crew by the operator. There was no evidence of any pre-existing disease, alcohol, drugs or any toxic substance in either of the pilots which may have caused or contributed to the cause of the incident. 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 instructed and evacuated by the crew and the rescue team from MAT.

1.16 Tests and research

No further tests were conducted on any equipment as the cause of the accident was evident.

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. A Ramp inspection was carried out on 26th September 2010. Base inspection was carried out on December 2009.

1.18 Additional Information

None

1.19 Useful or Effective Investigation Techniques

None

2. ANALYSIS

In order to understand the cause or causes of the accident interviews were held with the passengers, Captain and First Officer as well as the Cabin Crew. Meteorological reports including special MET Reports of the day as well as at the time of the incident were analyzed.

3. CONCLUSIONS

(a) Findings

- Light drizzle
- Approach was normal
- Aircraft landed on the right float and dug into the water contributing to a hard landing and a bounce.
- Aircraft bounced and the correction made by PIC, the aircraft landed hard and the right float detached.
- Landing was done with a cross wind.

(b) Causal Factors

- Altitude judgement in visual approach with no flare at touch down.
- Excessive wind corrections applied to the prevailing condition.
- Windshield wipers were not selected and applied.
- The incorrect landing procedure and hard landing caused the float to dig in to the water which subsequently caused a bounce. After the bounce the PIC was unable to make a correction causing a hard impact and float detaching.

4. RECOMMENDATIONS

1. Captain to undergo line flying under supervision followed by a line check.
2. Co-pilot to undergo training flights and check ride following 50 hours of flying under supervision of DCP/Training Captains followed by a line check.
3. Crew to undergo CRM training.
4. Float operators to review training procedures, specially approach and landing phases.
5. Monitoring of line flying by the operator to ascertain consistency with training.

Report compiled by:
Accident Investigation Coordinating Committee
Date: 24th February 2015

5. APPENDICES

Appendix 1



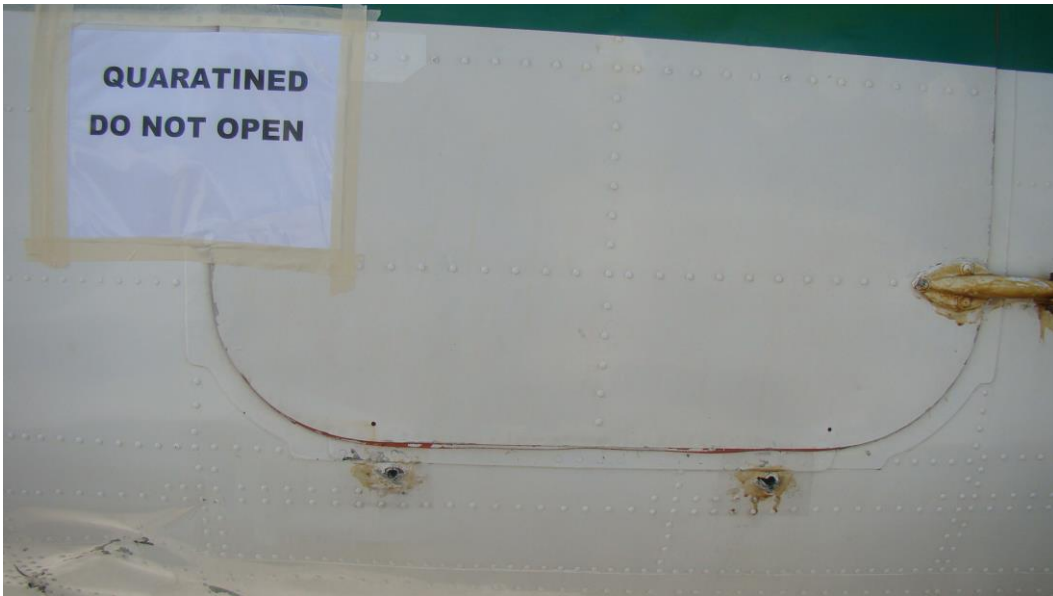
Appendix 2



Appendix 3



Appendix 4



Appendix 5



Appendix 6



Appendix 7



Appendix 8



Appendix 9



Appendix 10



Appendix 11



Appendix 12



Appendix 13



Appendix 14

629
01.61

08/12/2012 08:41
FLT218152MAT/Jaif Powell

TIME CONVERSION

SECTOR	SKED	ETC	WGT/DWT	KTAS	BURN	TOI/BURN	MFOB	+/- FUEL		
MLE-MOO	1000	:27	254 / 50	125	320	320	1200	0	0 - 9	0.1
MOO-THU	1037	:05	183 / 6	125	100	420	880	0	10 - 15	0.2
THU-CEN	1067	:10	148 / 15	125	190	570	780	0	16 - 21	0.3
CEN-MLE	1127	:28	05 / 53	125	330	900	630	0	22 - 27	0.4
									28 - 33	0.5
									34 - 39	0.6
									40 - 45	0.7
									46 - 51	0.8
									52 - 57	0.9
									58 - 63	1.0

#	OFF BLOCK	T/O	LAND	On BLOCK	AIR TIME	BLK. TIME	BOARD	DISMB	TOTAL	INFANT	
1	MOO	0954	1000	1024	1040	0.5	0.8	2(0)	2(0)	4(0)	0
2	THU	1056	1102	1109	1116	0.1	0.2	3(3)	2(0)	5(0)	0
3	CEN	1123	1124	1134	1137	0.2	0.5	7(3)	0(0)	12(0)	0
4	MLE	1143	1146					0(0)	12(5)	0(0)	0
5											
6											
7											
8											

Planned Airtime 1:22 1.2 Total

TO	MOO	THU	CEN	MLE
FAX	678	678	857	2034
F@TO	1775	855	755	605
BAGS	195	194	121	325
CARGO				
TOW	10631	10210	10228	11447
APS	8483	8483	8483	8483
PAX				
F@T O				
BAGS				
TOW				

CHECK REPETITIVE ITEMS

This aircraft has been loaded in accordance with MCAR OPS 1.605 for the above flights

FLT218152NTA/8Q-MAT/8483/1160/12.5
 CAPT Jaif Powell (FLT218152/1),
 F/O: Ahmed Tharsoom Mohamed (FLT218152/1),
 C/A: Hussain Hammad (FLT218152/1),
 DISP: Hamdhen - Dispatch

Tides(08/02/12): 01:42-1, 1 / 07:57-0, 1 / 14:06-1, 1 / 20:02-0, 2
 Sunset(08/02/12): 1821 Grounding time(08/02/12): 1830
 Tides(10/02/12): 02:08-1, 1 / 08:24-0, 1 / 14:38-1, 1 / 20:38-0, 2
 Sunset(10/02/12): 1821 Grounding time(10/02/12): 1831

Bump Luggage count: 51 Pax: JONSSON, LOF HENRI Dest MOORU Lbs: 134
 Luggage count: 41 Pax: BOLUMA, AMINA Dest MOORU Lbs: 98
 Add luggage

- Sent on oscar departure from East/Band takeoff.

- More large waves, had to go to flashing.

Appendix 15

