بسم الله الرحمن الرحيم

ACCIDENT INVESTIGATION COORDINATING COMMITTTEE

ACCIDENT REPORT ON
8Q-TMT (TWIN OTTER)
That collided with the fixed platform at Condrad (Rangali), South Ari Atoll
on 9th July 2012

Operator: **Trans Maldivian Airways**
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 1400 hrs (LT) by Trans Maldivian Airways. ICAO was notified by MCAA. The accident investigating coordinating committee reached the accident site at 1545 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 15th August 2012.

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
MCAD	:	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

The 8Q-TMT (DHC 6-300) aircraft departed from Ibrahim Nasir International Airport (INIA) water aerodrome (MLE) at 1250 hrs (LT), with 3 crew and 14 passengers on board. The flight was scheduled from Male' to Conrad Resort directly (approximately 35 minutes of flying from Male'). Co-pilot was the Pilot Flying (PF) on this sector. During the flight the weather was getting bad with strong winds from a westerly direction. Aircraft landed safely and the Captain taxied through the channel for docking where the fixed platform is attached to the main jetty. Since it was a fixed platform Crew had difficulty docking the aircraft in strong prevailing tailwind and swells. At the first attempt to dock the aircraft ended up forward of the platform which made the crew to abort docking. On the second attempt to dock, captain applied full reverse and right rudder while the co-pilot applied opposite aileron to overcome the strong winds as the aircraft approached the fixed platform. However, the aircraft moved forward and hit the platform hard and the cabin crew, who was at his station on the LH float, was flung in to the water. On impact with the platform the LH float attachments were sheared and the LH propeller blades struck the platform surface while the RH float lifted up and struck the RH propeller.
All the passengers and crew were able to evacuate the aircraft before the fuselage was fully submerged.

The investigation identified the following causal factors:

- Adverse weather condition at the accident site

- Collision with the platform due to judgemental error by the Pilot in Command of the prevailing conditions.

1. FACTUAL INFORMATION

Operator:	Trans Maldivian Airways Pvt. Ltd (Maldivian Air Operator Certificate Holder No.001)
Aircraft Type:	DHC-6-300
Aircraft Manufacturer:	De Havilland
Aircraft Owner:	Rocky Mountain Aircraft, Calgary.
Nationality:	Maldivian registered
Registration:	8Q-TMT
Place of Accident:	Conrad Maldives Rangali Island, Water Aerodrome (3.37'09" N 72.43'10"E)
Date and Time:	09th July 2012 at 1334 hrs.

1.1 History of Flight.

The 8Q-TMT (DHC 6-300) aircraft departed from Ibrahim Nasir International Airport (INIA) water aerodrome (MLE) at 1250 hrs (LT) on 9th July 2012, with 3 crew and 14 passengers on board. The flight was scheduled from Male' to Conrad resort directly (approximately 35 minutes of flying from Male'). Co-pilot was PF on this sector.

According to the meteorological report from Maldives Meteorological Service for Male' and Ari Atoll on 9th July 2012 from 1200 – 1500 hrs surface winds were generally from North-West at an average speed of 15 miles per hour. However, thunderstorms were prevailing over Ari Atoll and Male' region throughout the day. Ari Atoll, Maamingili Control Tower recorded winds of 42 knots.

During the flight the weather was deteriorating with strong winds from westerly direction. According to the crew it was very strong winds approximately 40 to 45 knots. Aircraft landed safely and the Captain took over controls as a normal procedure and taxied through the channel for docking at the fixed platform attached to the main jetty.

Since it was a fixed platform Crew had difficulty docking the aircraft in strong tailwind and swells. At the first attempt to dock the aircraft ended up forward of the platform which made the crew to abort docking. On the second attempt to dock, captain applied full reverse and right rudder while the co-pilot applied opposite aileron to overcome the strong winds as the aircraft approached the fixed platform. However, the aircraft moved forward and hit the platform hard and the cabin crew, who was at his station on the LH float, was flung in to the water. On impact with the platform the LH float attachments were sheared and the LH propeller blades struck the platform surface while the RH float lifted up and struck the RH propeller. The Captain reported cutting off the fuel at the first impact. The aircraft started turning, pivoting at its nose near the platform then started drifting away due to the strong winds and swells. (See appendix 2)

Immediately after the impact water started seeping inside the aircraft. The Captain attempted to secure the aircraft and the copilot was attempting to facilitate evacuation of the passengers. Cabin crew swam to the aircraft and joined the crew in the evacuation process. All the passengers and crew were able to evacuate the aircraft before the fuselage was fully submerged.

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**	**14**	**17**	**NIL**
Total	**3**	**14**	**17**	**NIL**

1.3 Damages to aircraft

The damage assessments observed are as follows:
i. L/H float with the spreader bars, boa tie and one v-strut had been completely detached from the fuselage
ii. Damage was observed on the L/H float out board side just aft of the forward bumper
iii. Both props damaged from strike on platform and float L/H and R/H respectively
iv. L/H wing and L/H engine with the fuselage was submerged for several hours
v. R/H engine and R/H wing except for wing root area was out of water throughout
vi. Both wing struts are bent L/H due to the heavy weight of the water filled wing R/H because of R/H float being wedged from one side
vii. Damage was observed on the fuselage underneath the cockpit.

1.4 Other damage

The platform was punctured due to the repeated strikes of the propeller and some rubber tires on the edge were cut off with the impact.
No fuel leaks or any other damages were observed.

1.5 Personnel information

1.5.1 Captain –

Age:	35
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Airline Transport Pilot Licence (Aeroplanes)
Medical issued on:	29 November 2011
Medical expires on:	30 November 2012
Type of medical:	Class 1
Licence issued on:	3 May 2010
Licence expires on:	2 May 2014

Types flown:	DHC-6, ATR-42 (on Maldivian licence)
Hours on type:	DHC-6 4889 hrs
Ratings:	DHC-6 Float Plane, ATR-42
Last Proficiency check:	11 June 2012
Total hours as PIC:	2072 hrs
Total flight time:	5477 hrs

1.5.2 Co-pilot –

Age:	29
Nationality:	Maldivian
Gender:	Male
Type of Licence:	Commercial Pilot Licence (Aeroplanes)
Medical issued on:	01st December 2011
Medical expires on:	31st December 2012
Type of medical:	Class 1
Licence issued on:	22 March 2011
Licence expires on:	21 March 2013
Types flown:	DHC-6 (on Maldivian Licence)
Hours on type:	1091 hrs
Ratings:	DHC-6 Float Plane
Last Proficiency check:	11 June 2012
Total hours as SIC:	1091 hrs
Total flight time:	1347 hrs

1.5.3 Cabin Crew –

Age:	26
Nationality:	Maldivian
Gender:	Male
Licence issued on:	30 September 2007
Medical issued on:	12 January 2011
Medical expires on:	30 January 2013
Type of medical:	Class 3

1.6 Aircraft information

1.6.1 General information –

Aircraft manufacturer:	Viking Air (De Havilland)
Model:	DHC-6-300 Twin Otter
Serial number:	454
Year of manufacture:	1975
Nationality:	Maldivian
Registration marks:	8Q-TMT
Validity of C of R:	Perpetual
Validity of C of A:	Perpetual
Name of owner:	Rocky Mountain Aircraft, Calgary
Name of operator:	Trans Maldivian Airways

1.6.2 Aircraft History –

Total flying hours since: -

- manufacture:	29948.3 Hrs (9 July 2012)
- last periodic inspection:	11.1 Hrs

Last inspection carried out at TAT: 29937.2 Hrs (EMMA #27, 6 July 2012)

1.6.3 Engines and propellers –

Right engine:

Manufacturer:	Pratt & Whitney (Canada)
Year of manufacture:	NA
Model:	PT6A-27
Serial number:	PCE42643
Total Hours since new:	9924.80 Hrs
Last overhaul date:	23 March 2012
Hours since overhaul:	207.80 Hrs
Last check carried out:	EMMA #27
Hours since last check:	11.1 Hrs

Left engine:

Manufacturer:	Pratt & Whitney (Canada)
Year of manufacture:	2006
Model:	PT6A-27
Serial number:	PCEPG0313
Total Hours since new:	7469.9 Hrs
Last overhaul date:	19 Mar 2009
Hours since overhaul:	3282.10 Hrs
Last check carried out:	EMMA #27
Hours since last check:	11.1 Hrs

Right propeller:

Manufacturer:	Hartzell Propellers Inc
Year of manufacture:	2002
Model:	HC-B3TN-3D
Serial number:	BUA26358
Last overhaul date:	29 July 2008
Hours since overhaul:	3001.20 Hrs
Last check carried out:	EMMA#27

Left propeller:

Manufacturer:	Hartzell Propellers Inc
Year of manufacture:	2001
Model:	HC-B3TN-3D
Serial number:	BUA24650

	Last overhaul date:	12 Dec 2009
	Hours since overhaul:	2252.90 Hrs
	Last check carried out:	EMMA#27

1.6.4 Fuel –

Type of fuel used:	Jet A1
Amount of fuel on board:	600 lbs

1.6.5 Accessories – No Component failed.

1.6.6 Defects – No deferrals at the time of accident

1.6.7 Aircraft load –

Certified take-off mass:	12,500 lbs
Certified landing mass:	12,500 lbs
Take-off mass as per load sheet:	12,499 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 by the company Operations Manual

1.7 Meteorological information

According to the meteorological report from Maldives Meteorological Service for Male' and Ari Atoll on 9th July 2012 between 1200 – 1500 hrs surface winds were generally from North-West at an average speed of 15 miles per hour. However, thunderstorms were prevailing over Ari Atoll and Male' region throughout the day.

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 were reported.

1.10 Aerodrome information

There is one attached platform and two overnight buoys on the lagoon. Take-off and landing area is located on the eastern half and the lagoon is divided by the narrow reef to the western half of the lagoon where the attached platform , The Lagoon can be accessed through a buoyed channel. (See Appendix 1)

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 shows that the aircraft LH float had hit the platform at a high speed. During the impact the lower end of the nose cone was punctured. LH float was completely detached from the aircraft few minutes after the impact. Barrels were tied to the aircraft to make it float and moved the aircraft to staff Accommodation Island in the same lagoon as Conrad resort. Secondary damage to the aircraft fuselage and doors were caused during salvage. (See Appendix 2)

1.13 Medical and pathological information

Medical examinations of the crew were not conducted. 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

The passengers were instructed and evacuated safely by the crew and resort staff before the fuselage fully submerged.

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. The company had undergone a Cockpit and Cabin En-route check on 14th April 2010. A Ramp inspection was carried out on 22nd April 2012. Re-certification audit was carried out on 26th-27th October 2011.

The company also holds a MCAR-145 approval and annual audits are being carried out by MCAA inspectors in addition to random spot checks.

1.18 Additional Information

Investigation team consisting MCAA officials and TMA officials reached the site at 1545. The captain and co-pilot were interviewed at Conrad. The available wreckage was thoroughly analysed and photographic evidence were collected. Since the eye witnesses were busy supporting TMA rescue team in beaching the aircraft, the interviews were not carried out on that day. However, interviews with eyewitnesses and the passengers were carried out the next day.

The aircraft wreckage was brought back to TMA base on 14 July 2012. Further analysis was done to observe the damages and identified the initial and secondary damages.

2. ANALYSIS

2.1 General

The severity of the impact made the aircraft LH float detach from the fuselage and puncture fuselage causing the aircraft to submerge in the rough water. All observed damages throughout the aircraft structure and floats were the result of impact and/or salvage cuts; therefore no indication of structural failure before the impact.

2.2 Operating Environment and Pilots Decision Making

The weather conditions at the point of departure (MLE) were appropriate for the flight. The exact weather for the destination point (CON) was unknown as the water aerodromes are not installed with equipments to provide weather information. However, TMA dispatch and pilots have the practice in receiving information from other aircraft available in that area or sometimes by directly calling to destination. The captain was qualified and had the required experience.

The platform is a jetty attached platform where most pilots use only the front of the platform for docking as it gives more space and convenient for passengers. However, some pilots have reported the difficulty in using attached platforms in adverse weather conditions or high tail winds. The resort is a high-end tourist resort and had no other optional floating platforms as the resort requires having the platform attached to avoid boat transfers. There are two mooring buoys which are normally used for night shutdowns only.

Even with the high wind and an on-setting thunder storm, captain decided to dock the aircraft considering that would be the safest option for the passengers. The captain's first attempt to dock the aircraft failed due to the high tail wind and the aircraft was manoeuvred away from the platform. A second attempt was made to dock the aircraft while the storm was getting even stronger. To overcome the high (westerly) tail wind captain applied full right rudder while the co-pilot was assisting with the flight controls to overcome the effects of strong tail wind. At about 10 feet from the platform captain applied full engine reverse to control the aircraft and dock; but the excessive speed due to the strong tail wind pushed the aircraft forward uncontrolled, resulting the aircraft to hit the platform at high speed.

3. CONCLUSIONS

(a) Findings

- Weather information not available at outstations.
- Only a jetty attached platform available at Conrad limiting the options for docking in emergency.
- The flight crew were not aware of the alternative techniques that can be used while docking in adverse weather conditions.
- No specific beaching areas allocated at Conrad.
- Operational limitations not identified.
- CRM training not very effective.

(b) Causal Factors

AICC determines that the probable cause(s) of the accident as follows:

Pilot in Command's miss judgement of wind condition and its effect during docking procedure resulting in the aircraft colliding with the docking platform at a very high speed. Major contributing factor was high tail winds and adverse weather condition prevailing at the time of accident.

4. SAFETY RECOMMENDATIONS

- Floating platform to be installed as an alternate docking option during adverse weather conditions at locations where fixed platforms are used.
- A procedure for the flight crew to get weather information (wind direction and speed) at all out stations.
- Operational limitations to be introduced for all operational phases (take-off, landing, docking, beaching etc) of the flight.
- Cabin crew to wear life vest while operating outside the aircraft.
- "Decision making" to be emphasized in CRM training.
- Review company procedure for medical examination of the crew after an accident.

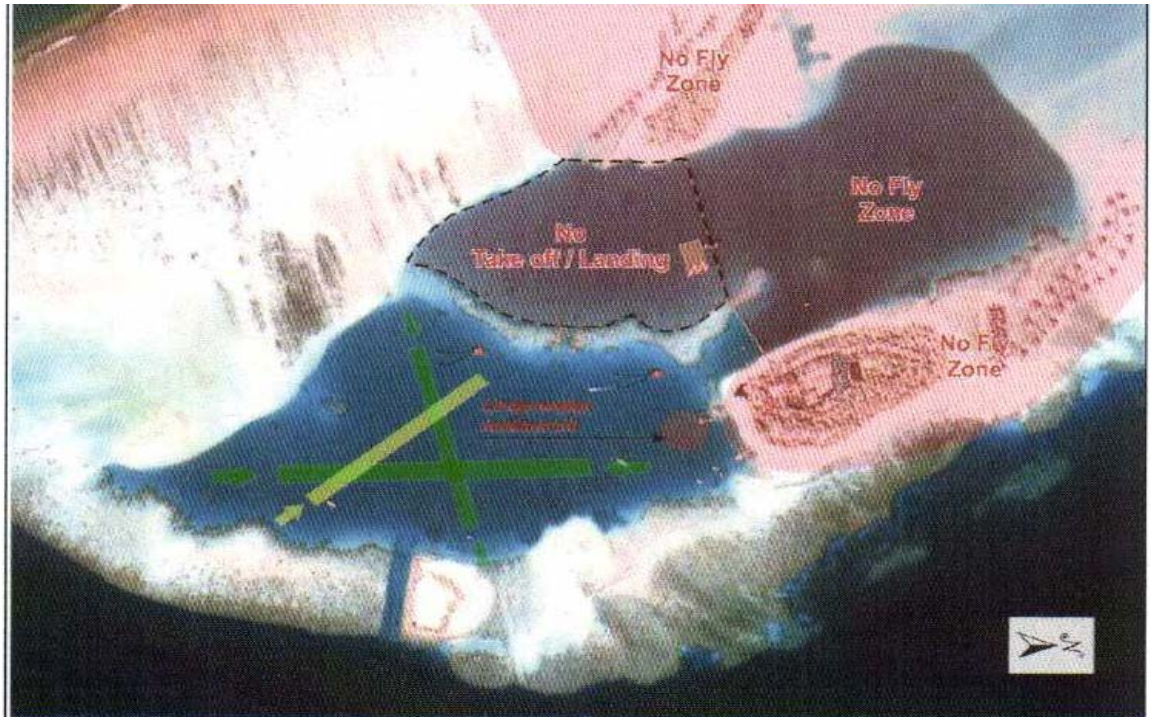
Report compiled by:

Accident Investigation Coordinating Committee

Date: 16th August 2012

5. APPENDICES

Appendix 1- Aerodrome Layout



APPENDIX 2

Image 1- photo taken during 1st attempt to dock

Image 2- Aircraft after the impact

Image 3- Evacuating the passengers.
Photo also shows the weather after impact

Image 4- Aircraft fuselage submerged

Aircraft damages

Image 5- LH Float damaged during the impact

Image 6- LH Float attachments

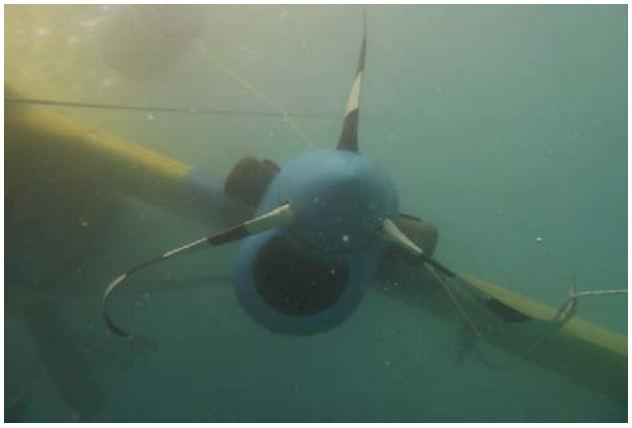


Image 7- LH Propeller

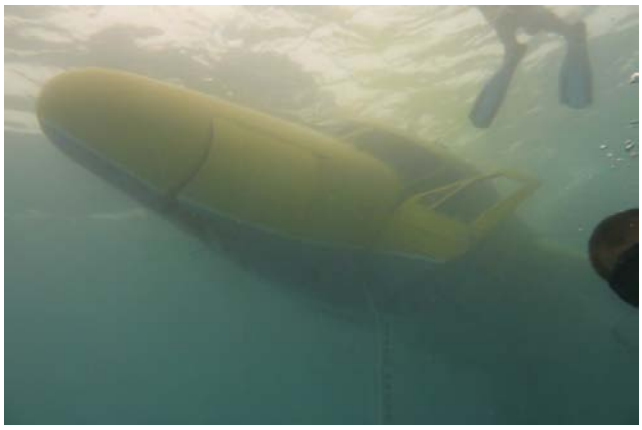


Image 8- Aicraft fusalage

Platform Damages

END OF REPORT