



REPUBLIC OF MAURITIUS

DEPARTMENT OF CIVIL AVIATION

Sir Seewoosagur Ramgoolam International Airport, Plaine Magnien

**FINAL
INVESTIGATION
REPORT**

**ACCIDENT OF
MICROLIGHT AIRCRAFT
3B-WWI,
ON 24 FEBRUARY 2023**

DCA Investigating team





Investigator Team	Function	Signature
Flight Operations Inspector	Lead Investigator	
Airworthiness Engineer	Investigator	
Mandatory Occurrence Reporting Officer	Investigator	
Personnel Licensing Assistant	Investigator	

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Abbreviation

DCA	Department of Civil Aviation
FL	Flight level
GSE	Ground support equipment
hPa	Hectopascal
kg	Kilogram
Kts	Knots
MLW	Max landing weight
PIC	Pilot in command
CTR	Control Zone
MHz	Megahertz

1.0 Introduction

On 24 February 2023, at 17:30, the microlight aircraft 3B-WWI capsized in the sea after an emergency landing due to engine stroke, near the coast of Palmar.

The Department of Civil Aviation was notified of the accident at 12.02 hours on Monday 27 February 2023.

As such, an investigation team was set-up on 01 March 2023 by the Director of Civil Aviation to carry out the investigation.

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

This final investigation report is published to provide information gathered from ground inspection, meteorological data, recorded images and other sources.

2.0 Synopsis

The microlight aircraft 3B-WWI of Air Paradise Ltd was operating a sightseeing flight from Palmar to Ile aux Cerfs on 24 February 2023, at 17:30. After take-off, before levelling at 400 ft, 3B-WWI encountered an engine stroke, leading to an emergency landing in the sea, near the coast of Palmar. No injuries were sustained by the pilot and the passenger on-board.

The nominated investigation team has carried out an onsite inspection of the microlight aircraft 3B-WWI at its base in Palmar on 02 March 2023. The investigation team also interviewed the Pilot-in-Command on the same day.

3.0 Factual information

3.1 History of the flight

The Pilot-in-Command (PIC), holder Mauritian Validation No. CAV/LIC/, reported an incident that occurred with aircraft 3B-WWI on Friday 24 February 2023 around 17h30 off the coast of Palmar.

That morning, the PIC started with the daily check after fuelling and adding 2-stroke engine oil.

The weather condition was good for flying in that region with a 12 Kts wind from 140°, no rain and adhoc visibility. Besides, other ultra-light aircraft were also flying.

The aircraft was towed by the trailer to the beach and the wing was opened, secured and connected to the raft. The pre-flight check was then carried out for the wing, the hull, and the engine. Everything was found to be in good condition.

After the engine was heated as usual and a test flight was done by PIC to verify if everything was in good flying condition, a radio broadcast was done on 123,4 information frequency.

The PIC was satisfied that Air Paradise Aeroclub member passengers could now go for a flight.

At 14h00, 2 flights had been successfully carried out by the aircraft. The PIC did another routine check between flights. Nothing was found to be defective. A third flight was then carried out.

The fourth flight started with an Aero Club member passenger on-board. The aircraft took off from the coast of Palmar (near C Mauritius Hotel). The PIC started losing power before levelling at 400ft and just after take-off. Then the engine stopped abruptly. The PIC tried to restart unsuccessfully. The aircraft was losing altitude and the PIC started the procedure for an emergency landing without engine power and by gliding.

The PIC had to land in the sea near reefs about 50m away from the coast. After landing safely, the aircraft was facing Ile aux Cerfs and the wind was blowing on the left hand side. The PIC tried to restart the engine again without success while keeping the left side of the wing down, to prevent the wind from lifting the aircraft and capsizing, which is a usual procedure during taxi in and out of shore.

At some moment, big waves start to hit the aircraft and the PIC tried to keep the wing down against the wind but a bigger wave caught the wing and pressed it downwards. The wing went into the water and touched the ground. The aircraft was stuck and the PIC requested the passenger to alight the aircraft, hopping off and standing in the shallow water.

Afterwards, other waves continued to hit the aircraft structure up to capsizing the whole aircraft despite the PIC trying to bring it back into position. The passenger also helped the PIC out but they could not prevent it at all.

Coast Guards from Trou d'Eau Douce were already patrolling in the vicinity. They witnessed the whole scene without providing assistance to the aircraft. The PIC requested the passenger to move ashore (walking in the water (1.20m. deep)). Meanwhile the PIC managed to bring the aircraft in normal position by applying the recuperation procedure.

The aircraft turned to normal float position and the PIC pulled it by hand as he walked to the beach where the coast guards were waiting. The Coast Guards requested information and documents related to the aircraft and PIC. The license and permit to fly were submitted to them.

The PIC followed immediately the procedures after capsizing (cleaning and washing to remove saltwater from the aircraft and the wing). Return to base has occurred by night.

3.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Serious	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Minor	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

3.3 Damage to aircraft

- Engine blocked and seized
- One propeller dented
- Main support axes of the wing bent
- Engine bracket bolted to the raft damaged
- Delta wing found unusable
- Light support of the wing bent

[see photos below for more details](#)

3.4 Other damage

Damage to other aircraft: *nil*
Other Damage to other facilities: *nil*

3.5 Crew and Personal Information

Pilot-in- Command (PIC):

Pilot-in-Command Licence: Mauritius DCA Validation No: CAV/LIC off a valid DGAC French ULM Pilot Licence (No

Pilot-in- Command age: 44 years

Flying experience on type:

Total Time: 97hrs 30

Last 90 days: 22.hrs 30 - 32 landings

3.6 Aircraft information

The Polaris Motor SRL FIB 582, 3B-WWI, is a Microlight aircraft equipped with a two-stroke engine Rotax 582 and one PIC and one passenger configuration.

The aircraft has a Certificate Registration issued by the DCA on 8 January 2016. The Validity of the Airworthiness Permit to Fly is renewed on an annual basis, following a satisfactory inspection and review of technical records.

The Validity of the Permit to Fly was last renewed on 04 November 2022, however following this accident, the Permit to Fly of the microlight 3B-WWI was suspended.

Operator:	Air Paradise Ltd
Aircraft Type and Registration:	Polaris Motor Srl. FIB 582 – Reg 3B-WWI
No & Type of Engines:	ROTAX 582 - Sn. 1531422
Year of Manufacture:	2015
Category:	Microlight Aircraft
Location:	Coast of Palmar - Mauritius
Date & Time (UTC):	24 February 2023 at 17.30 Hrs.
Type of Flight:	Aeroclub Member – Sightseeing flight
Persons on Board:	Crew - 1 Passenger – 1
Injuries:	NIL
Nature of Damages:	Engine blocked and seized One propeller dented Main support axes of the wing bent Engine bracket bolted to the raft damaged Delta wing found unusable Light support of the wing bent

3.7 Meteorological information

The weather condition was good for flying in that region with a wind from 140° of 12 knots and no rain. Similar operations of another operator in the same area were underway.

3.8 Aids to Navigation

N/A

3.9 Communication

PIC was communicating on the local information frequency (123,4 MHz) – No contact with ATC at SSR International airport. (All Air Paradise flights conducted outside the CTR)

3.10 Aerodrome Information

Not applicable

All flights from and to Air Paradise base at Palmar outside MRU CTR

3.11 Flight Recorders:

Not applicable

3.12 Impact information

There was no impact involved to any other aircraft or facilities around.

3.13 Medical and pathological information

According to the PIC declaration, there was no stress or panic on-board (Passengers & Pilot). No person was injured.

3.14 Fire

The incident did not involve any fire on-board.

3.15 Survival aspects

Not applicable

3.16 Tests and research

Not applicable

3.17 Organizational and management information

Pertinent information was received from Air Paradise for the access of documentations and operational records as well.

3.18 Additional information

Not applicable

3.19 Useful or effective investigation techniques

- Face-to-face interview of PIC.
- Aircraft and damaged pieces' inspection.
- Analysis of technical and operational documentations (Technical and Pilot Log Books – Air Paradise Operations Manuals).
- Research on Engine oil viscosity differences from Brand to Brand
- MOTUL 2 Stroke oil - **100 % Synthetic**
- SERVO 2 T Supreme oil - **Semi -Synthetic**

4.0 Analysis

4.1 General

A field investigation was carried out by the DCA team at Palmar on 02 March 2023. The aircraft was parked at Air Paradise base (outside). At the time of inspection, engine and raft were available in the yard and the wing was lying on the ground right next to them, fully accessible for inspection.

4.2 Inspection on site – Elements analysis

4.2.1 Wing

After the emergency landing, all components of the Microlight Aircraft were serviceable. It was after the capsizing of the Microlight that the wing were damaged as shown at [6.3](#), [6.4](#) and [6.5](#).

4.2.2 Raft

Same as 4.2.1 and see photos below.

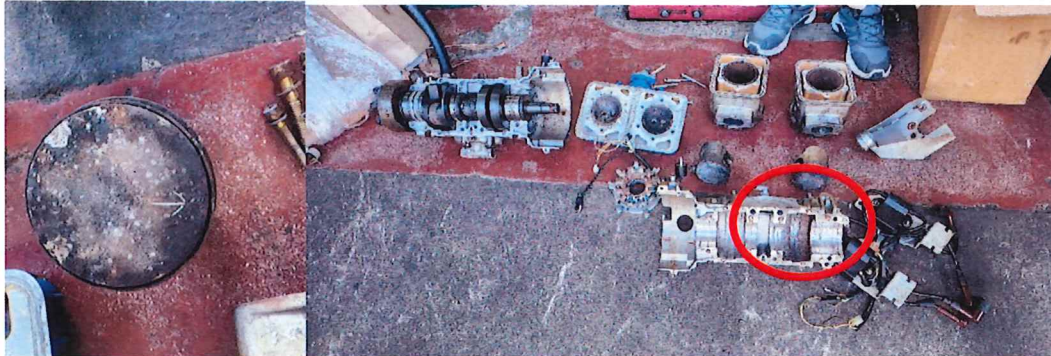
4.2.3 Engine

Engine has been investigated at the garage in charge of the disassembling and it was observed that the Piston Head was burned due to overheated conditions and also the crankcase damaged by the abnormal friction of the crankshaft. Both observed damages are due to a lack of lubrication.

Upon query with Engine Manufacture, we have been informed that it is highly recommended to use 100% synthetic oil for intensive use of the engine (short flights with high temperature and high rate of climb). However, during investigation the PIC mentioned that on the day of accident the correct oil (2 strokes 100 % synthetic engine oil) was not available at the gas station and subsequently he chose to use alternate engine oil with different characteristic of lubrication (2 strokes 50% synthetic oil). The PIC stated that he did not find it necessary to look for the usual oil used.

Since on that day, the accident occurred on the fourth consecutive flight which can be considered as intensive use of the engine.

Based on this information, it can be concluded that the accident occurred due to inappropriate lubrication following the unusual quality of engine oil used, leading to engine overheating and consequently, engine seizure and emergency landing on the lagoon.



4.2.4 Passenger seat – Pilot seat

At the time of the on-site audit, there were no defect with the overlay seats. The seat belts were in place and functional.

Note: Seat belts are not used during scenic flights (danger of drowning in the event of a forced landing with the aircraft overturning)

4.2.5 Instrument panel

The instrument panel is composed of:

- RPM Indicator (Revolutions per minute)
- EGT Indicator (Exhaust Gas Temperature)
- Cylinder Head Temperature gauge
- Timer

Please note that since this is a two-stroke engine, there is no oil pressure or oil temperature gauge.



4.3 Flight operations

4.3.1 Crew qualifications

PIC was licenced and current on the class of ULM

The PIC is licenced on the ULM since 12 April 2022, holder of Foreign Licence Validation Certificate No CAV/LIC/, valid until 02 May 2023.

4.3.2 Operational procedures

According to Air Paradise approved Operations Manual, the approved flight plan is as follow:

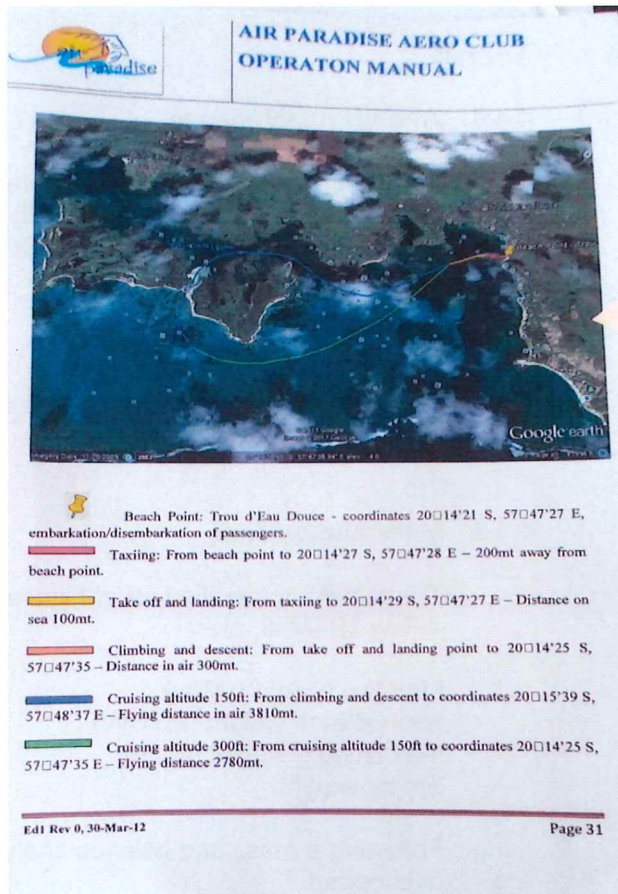
- Embarkation and disembarkation of passengers at "Beach Point, Trou d'Eau Douce
- The taxiing should start at the Embarkation point up to 200 meters from the beach, facing South
- Take-off and landing distance on sea is about 100 meters facing South East
- Climbing up to 150 ft along the east coast, flying around Ile aux Cerfs and from Ile aux Cerfs Lagoon, flying back climbing to cruising altitude at 300 ft.
- From cruising altitude, descending to the landing point, on a North West track
- Taxiing back to the shore at disembarking point.

From the PIC interview and from two different complaints about Air Paradise that the Department has received, it was found that the authorised circuit published in the Air Paradise Operations Manual Edition 01, Rev. 0 dated 30 March 2012 and approved by the Department has not been respected. (Trou d'eau douce - Ile aux Cerfs, page 31 of the Manual)

The complaints mentioned that the same day of the accident, Air Paradise was flying at an altitude of 50 - 70 feet over the beach of Palmar creating high disturbing noise over the area and it was also noted that the taxiing procedures was not applied (Take off and landing close to the beach)

Furthermore, from the interview of the PIC, it was found that the daily and pre-flight check are **not** supported by an existing checklist (41 items to be checked as per Air Paradise Operations Manual).

In conclusion, it is clear that Air Paradise's flight operations do not follow the procedures and itinerary authorised by the Department.



4.3.3 Weather

No adverse weather condition

4.3.4 Air traffic control

Not applicable

All flights have occurred outside the CTR

4.3.5 Communications

Local Information on 123,4MHz Frequency

4.3.6 Aids to navigation

Not applicable

4.3.7 Aerodrome

Not applicable

4.4 Aircraft

4.4.1 Aircraft maintenance

The aircraft was properly maintained according to the operators Maintenance Manual and satisfy the requirement of the release of the "Permit to Fly" delivered by the DCA.

4.4.2 Aircraft performance

The aircraft was fully operational and there was nil defect reported during the preceding flight.

4.4.3 Mass and balance

The maximum certified weight limitations for Polaris Motor Srl. FIB 582 – Reg 3B-VWI, are:

Max taxi weight (MTW)	450 kg
Max take-off weight (MTOW)	450 kg
Max landing weight (MLW)	450 kg
Empty weight	240 kg

Following a mass and balance analysis, it was found that the flight was overloaded.

Payload 450 kg (MTOW) - 240 kg (empty weight) – 50 kg (Fuel) = 160 kg

PIC 90 kg + Passenger 90 kg = 180 kg

Total MTOW for the concerned flight = 470 kg = **20 kg excess load**

4.4.4 Aircraft instrumentation

All the equipment was functioning properly and no faults were reported on the aircraft log book.

It has been observed during the investigation that all navigation data's (tachymeter, variometer, altimeter) are furnished by a single portable device and no support for the device was found on the airframe.

4.4.5 Aircraft systems

All the aircraft systems were functioning properly and no faults were reported on the technical log.

4.4.6 Damage to aircraft

[see photos below for more details](#)

4.4.7 Aircraft log book

It is to be noted that there was no daily entry in the aircraft logbook but only main maintenance operations have been recorded.

4.4.8 The Line Transit Check

Not applicable

4.4.9 Evidences and statements

The Department has obtained and reviewed the following:

1. Video footage taken by a tourist on the near beach.
2. Copy of Certificate of Registration of Association for Air Paradise Aeroclub.
3. Copy of Certificate of Registration issued by DCA (3B-WWI).
4. Copy of Brevet et Licence de Pilote d'ULM delivered by French DGAC on 04 April 2022.
5. Air Paradise membership form – Introductory flight.
6. Copy of Air Paradise insurance certificate valid up to 31 January 2024.
7. Copy of DCA Foreign Licence Validation Certificate No. CAV/LIC/.
8. Visit to the garage where the engine was disassembled

The PIC was interviewed by the DCA Investigation team on 02 March 2023 at its base at Palmar.

Another additional interview of the PIC was held during the visit at the garage at Phoenix on 09 May 2023

4.4.10 Turn Around Ground Operations

Visual and oil level checks in between flights

5.0 Conclusion

Occurrence Category

Since the aircraft has encountered severe damages the occurrence is classified as an accident

5.1 Causes/Contributing Factors

1. The change of Oil brand has affected the lubrication of the engine due to difference of grade of viscosity.
2. Inaccurate Monitoring of oil temperature and pressure inaccurate.
3. Defective cooling system.
4. Intensive operations + limit / overload mass & balance conditions – short cruise (short cooling conditions)

6.0 Documents / Photos

6.1 Aircraft Log Book

SERVICE DE L'AVIATION - AIRCRAFT RECORD

Date	Temps de vol depuis le précédent opérateur d'entretien	Heures totales	Heures depuis l'entretien majeur	Nombre d'atterrissages	Modif de l'entretien
Date	Duration of flight since last maintenance operation	Hours since manufacture	Hours since major maintenance	Number of landings	Maintenance status
07.01.17	16 hrs 23	272-30		81	
17.01.17					
					15.02.19 - servicing, changed spark plugs, cleaned carburettor, check valve & cables. Run engine for about 1 hour.
					Engine hour meter not working properly
23.03.19					Clean spark plugs & carburettor - start
25.03.19					Engine Run for about 30 mins
30.12.19					"
29.04.18					"
25.08.18					"
19.12.19					"
20.08.19					"
12.10.17					"

6.2 General view of the aircraft and Air Paradise base



6.3 Wing



6.4 Wing damages



6.5 Wing damages



6.6 Propeller dented



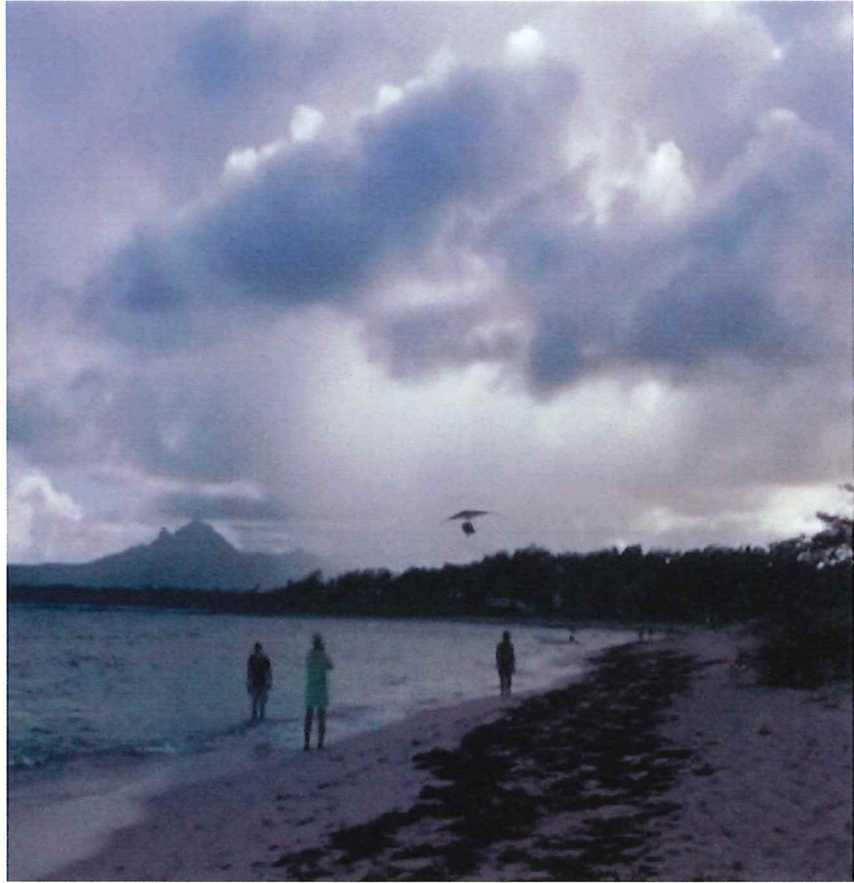
6.7 General view of the two seats aircraft and free exhaust pipe



6.8 Engine instruments console



6.9 Low altitude flight over the beach



6.10 Aerobatic very noisy recovery over the Palmar beach



