REPUBLIC OF NAMIBIA

MINISTRY OF WORKS AND TRANSPORT

DIRECTORATE OF AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION

CIVIL AIRCRAFT ACCIDENT REPORT

ACCID/11152021/01-04

OPERATION	**: TRAINNING**
AIRCRAFT	**: V5-USC**
LOCATION	**: ENGINE FAILURE 10 KM NORTH OF EROS AIRPORT**
DATE	**: 15 NOVEMBER 2021**

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MINISTRY OF WORKS AND TRANSPORT

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Enquiries: O. V. Plichta **Our Ref: 3/48** **Date:** 11 April 2022

To : Honorable Minister: Works and Transport

From : Director: Aircraft Accident and Incident Investigation

RE: TRAINNING ACCIDENT REPORT

Please find attached the final report on the above subject accident. In accordance with the International Civil Aviation Organization Annex 13 – Aircraft Accident and Incident Investigation – Standard 6.13, final reports shall be published as soon as possible in the interest of accident prevention.

It is recommended that copies of these final reports be made available to the public and other interested parties upon request. Your approval is therefore sought to release the said reports.

Magnus Abraham
DIRECTOR: AIRCRAFT ACCIDENT INVESTIGATION

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FOREWORD

This report presents the factual information, data analysis, conclusions, and safety recommendations reached during the investigation. The purpose of the investigation was to establish the circumstances surrounding this accident.

In accordance with the provisions of Annex 13 to the contention on International Civil Aviation Organization, the accident's analysis, conclusions, and safety recommendations contained therein are intended neither to apportion blame nor to single out any individual or group of individuals. The main objective was to identify the systematic deficiencies and draw lessons, from the occurrence, which might help to prevent accidents and incidents in the future. To this end, many a time, the reader may be interested in whether or not an issue was a direct cause of the accident (that has already taken place), whereas the investigator is mainly concerned with the prevention of future accidents/incidents.

As a result, usage of this report for any purpose other than (the latter and spirit of Annex 13 and other relevant statutes) prevention of similar occurrences in the future might lead to erroneous interpretations and applications.

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ABBREVIATIION

ATPL	-	**Airline Transport Pilot License**
AGL	-	**Above Ground Level**
UTC	-	**Universal Time Co-ordinate**
MPI	-	**Mandatory Periodic Inspection**
AD	-	**Airworthiness Directive**
SB	-	**Service Bulletins**
CRM	-	**Crew Resources Management**
FDR	-	**Flight Data Recorder**
CVR	-	**Cockpit Voice Recorder**
AOC	-	**Air Operated Certificate**
ICAO	-	**International Civil Aviation Organization**
C of A	-	**Certificate of Airworthiness**
C of R	-	**Certificate of registration**
AMO	-	**Aircraft Maintenance Organization**
CPL	-	**Commercial Pilot License**
ETA	-	**Estimated Time of Arrival**
FYKH	-	**Kiripotib Airfield**
Km	-	**Kilometers**
SOPs	-	**Standard Operating Procedures**
NM	-	**Nautical Miles**

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ACCID / 11152021 / 01-04

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ACCIDENT REPORT – EXECUTIVE SUMMARY

Aircraft Registration	**V5-USC**	**Date of Accident**	15 Nov 2021	**Time of Accident**	12:05 UTC
Type of Aircraft	TAF SLING 4		**Type of Operation**	Training	
Pilot-in-command license type	Commercial pilot	**Age**	27	**License valid**	Yes
Pilot-in-command flying experience	Total flying hours	3029.7		Hours on type	2281.5
Last point of departure	Eros Airport (FYWE), Windhoek				
Next point of intended landing	Eros Airport (FYWE), Windhoek				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)					
10 KM north of Eros Airport S 22° 28 17 E 017° 00 11					
Meteorological Information	Surface wind 340° /04 KTS Visibility 9999 (More than 10 KM) Temp 32°C FEW100CB Air Pressure QNH 1022 Hpa				
Number of people on board	2	**No. of people injured**	0	**No. of people killed**	0

Synopsis

On the 15th November 2021 around 11:53 UTC, a Sling 4 with Registration V5-USC took off from Eros Airport (FYWE) Windhoek with Instructor and a student instructor on board. The intention was to fly to the General Flying Area (GFA) to train the student instructor towards his instructors rating. After passing the Goreangab Dam at 6500 feet the instructor requested Eros Air Traffic controller (ATC) to return to the Airfield due to a surging fuel pressure. The aircraft was cleared inbound, but the fuel pressure remained in the red (low) and an engine failure was imminent. The crew then decided to do an emergency landing on a construction road. A distress call ("Mayday Mayday") and also their intentions to try and land on a gravel road was made to Eros tower by the student while the instructor configured the aircraft for the emergency landing. The forced landing was unsuccessful due to vegetation next to the road, on landing the left wing struck the bushes and the aircraft veered to the left where it hit more vegetation and was destroyed by the impact. Both pilots were not injured.

The Directorate of Aircraft Accident and Incident Investigations (DAAII) in Namibia was informed by the Eros Air Traffic Control tower telephonically about the accident and DAAII responded immediately to start an official investigation.

The weather at the time of the accident was light winds with a few clouds at 10 000 feet and rain in the vicinity.

The last Annual Inspection (AI) was carried out and certified on 08 October 2021, in accordance with the MICAM Maintenance Manual and NAMCARS 2001 by a Namibian AMO with approval No. 004 issued on the 11 Feb 2021 with the expiry date of the 10 Apr 2022 at the total of 3696.6 air frame hours (3696 Hobbs). The approval was issued in accordance with Part 145 of the NAMCARS 2001. At the time of the accident, the aircraft accumulated a further 80.0 hours since the last MPI.

Probable Cause

Engine failure.

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AIRCRAFT ACCIDENT REPORT

Name of Owner / Operator	**: Signa Aviation Services**
Manufacturer	**: The Airplane Factory (TAF).**
Model	**: TAF Sling 4**
Nationality	**: Namibian**
Registration Marks	**: V5 - USC**
Place	**: 10 KM north of Eros Airport, Windhoek S 22° 28 17 E 017° 00 11**
Date	**: 15 Nov 2021**

All times given in this report are Co-ordinated Universal Time (UTC), unless otherwise stated.

Disclaimer:

The report is produced without prejudice to the rights of the Directorate of Aircraft Accident and Incident Investigations, which are reserved.

Purpose of the Investigations:

In terms of the Aviation Act (Act No 6 of 2016) and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of risk of aviation accidents or incidents and **not to apportion blame or establish legal liability.**

This report contains facts relating to aircraft accidents or incidents which have been determined at the time of issue.

The report may therefore be revised should new and substantive facts be made available to the investigator.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On the 15th November 2021 around 11:53 UTC a training flight took off from Eros Airport (FYWE) Windhoek with Instructor and a student instructor on board. The aircraft was a Sling 4 with Registration V5-USC.

1.1.2 The intention was to fly to the General Flying Area (GFA) to train the student instructor towards his instructors rating. After passing the Goreangab Dam at 6500 feet the instructor requested Eros Air Traffic controller (ATC) to return to the Airfield due to a surging fuel pressure indication. The aircraft was cleared inbound, but the fuel pressure remained in the red (low) and an engine failure was imminent. The crew than decided to do an emergency landing on a construction road. A distress call ("Mayday Mayday") and also their intentions that they would try and land on a gravel road was made to Eros tower by the student while the instructor configured the aircraft for the emergency landing.

1.1.3 The emergency landing was unsuccessful due to vegetation next to the road and on landing the left wing struck the bushes and this caused the aircraft to veer to the left where it hit more vegetation and was destroyed by the impact.

1.1.4 The pilots did not sustain any injuries and vacated the wreckage, they then called their flight training school as well Eros Air Traffic Control.

1.1.5 The Flight School activated their Emergency Response Plan (ERP).

1.1.6 An Ambulance, the flight school and DAAII investigators rushed to the accident site.

1.1.7 The prevailing weather was light winds with a few clouds at 10 000 feet and rain in the vicinity.

1.1.8 V5-USC: Below is an illustration of the emergency landing

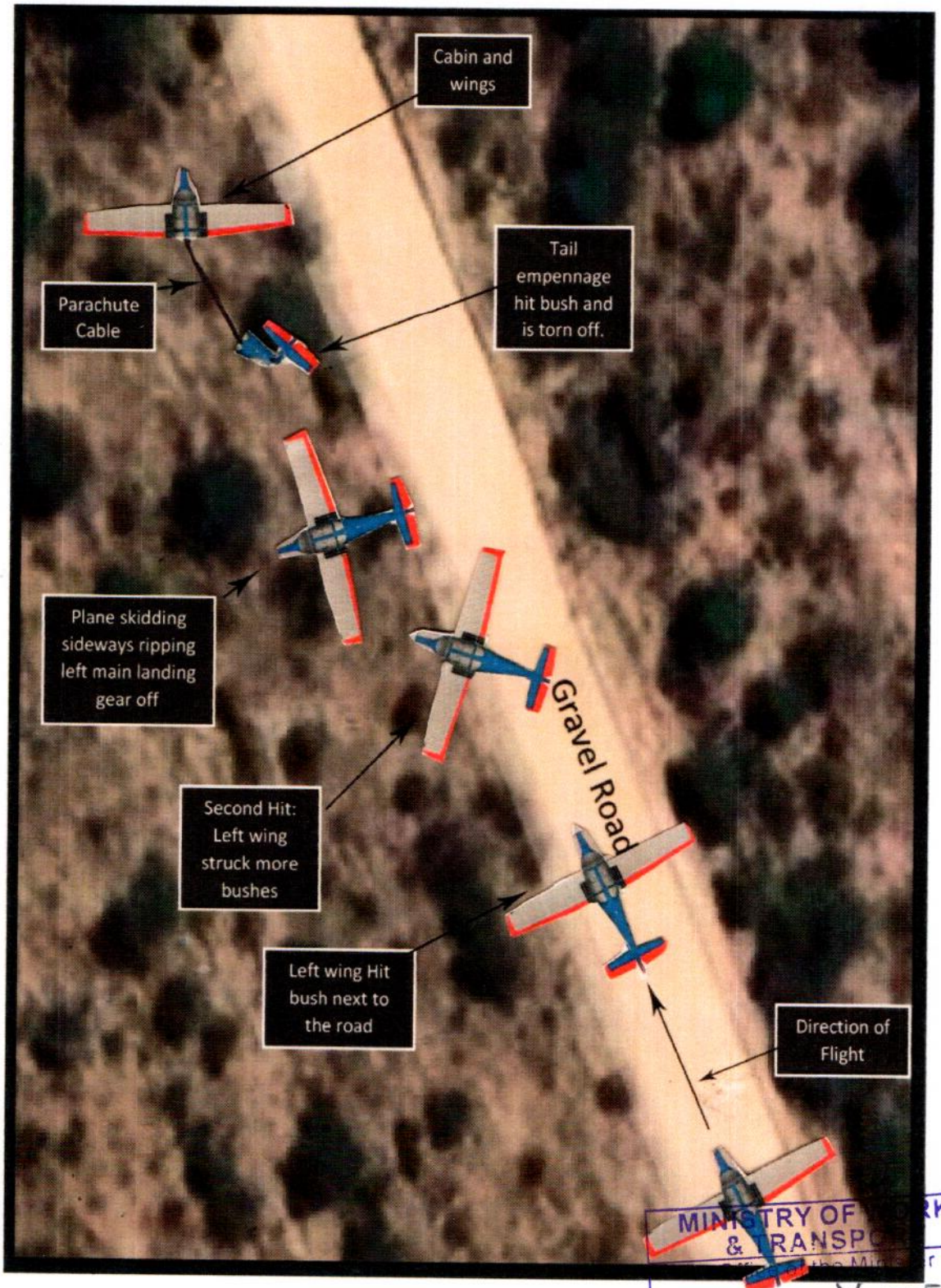

Image 1- : Illustration

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1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1	1	-	-

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed on impact.

Image 2- Aircraft came to stop next to the road.

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1.4 Other Damage

1.4.1 There were no other damages.

1.5 Personnel information

Nationality		South African			
Licence No	CA73092	Gender	Female	Age	27
Licence valid		Yes	Type endorsed	Yes	
Ratings		Night, Instrument and Instructor			
Medical expiry date		03 December 2022			
Restrictions		None			
Previous accidents		Not known			

Flying Experience:

Total hours	3029.7
Total past 90-days	178.8
Total on type past 90-days	157.2
Total on type	2281.5

1.6 Aircraft information

Image 3 – File photo of aircraft

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Airframe:

Type	TAF Sling 4
Serial No.	075K
Manufacture	The Airplane Factory (TAF) Sling 4.
Year of manufacture	Not Available
Total airframe hours (at time of accident)	3724.0
Last annual inspection (hours & date)	3644.0 8 October 2020
Hours since annual inspection	80.0
Authority to Fly (issue date)	08 October 2021
Authority to Fly (expiry date)	08 October 2022
C of R (issue date) present owner	08 December 2016
Operating categories	Experimental Aircraft

Engine:

Type	Rotex 914 UL
Serial No.	9575235
Hours since New	3724.7
Hours since Overhaul	1328.5

Propeller:

Type	Airmaster AP332SF
Serial No.	1285
Hours since New	1189.0
Hours since Overhaul	146.5

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1.7 Meteorological Information

1.7.1 The investigator did obtain a weather report.

1.7.2 The prevailing weather was light winds with a few clouds at 10 000 feet and rain in the vicinity

1.8 Aids to navigation

1.8.1 The aircraft was equipped with standard navigation equipment and a panel mounted GPS.

1.9 Communications

1.9.1 The aircraft was equipped with standard communication equipment for this type. Aircraft maintained radio communication with Eros tower (FYWE) on 118, 7 MHZ.

1.10 Aerodrome information

1.10.1 Public gravel road North of Katutura suburbs.

1.11 Flight recorders

1.11.1 The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR) nor was it a requirement by the regulation for this type, however a data download was made available by the AMO for certain engine performance parameters.

1.11.2 The GPS model did not make provision for data downloads.

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1.12 Wreckage and impact information

1.12.1 Location of Accident next to the gravel road.

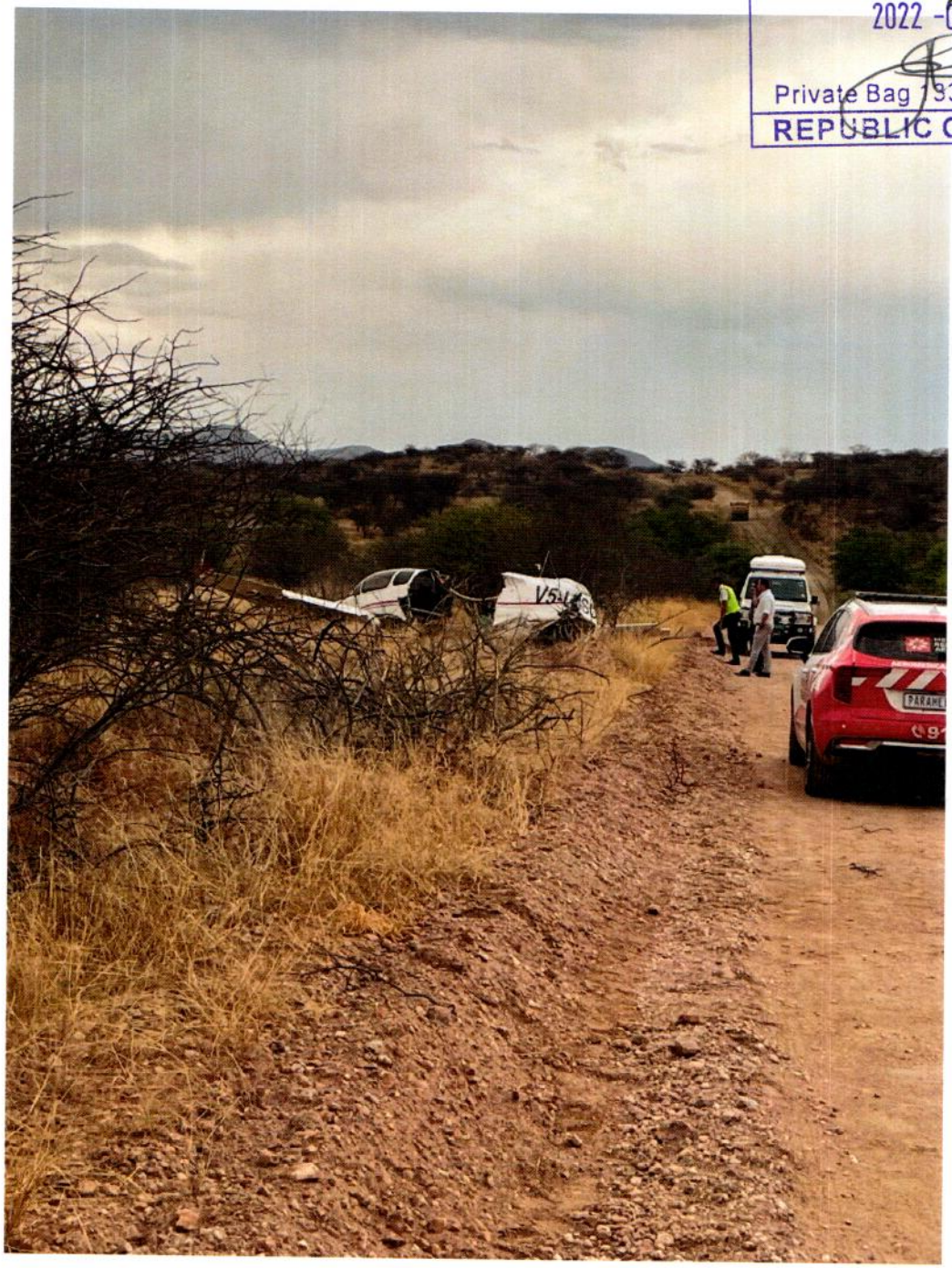

Image 4: Aircraft was destroyed on impact and the tail empennage was torn from the main cabin.

Image 5: Red arrow shows impact of bushes that struck left wing on landing.

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1.13 Medical and pathological information

1.13.1 None was required.

1.14 Fire

1.14.1 There was no pre- or post-impact fire.

1.15 Survival aspects

1.15.1 The accident was survivable due low impact speed and the aircraft was configured for landing.

1.15.2 The main cabin section remained intact during the crash landing.

Image 6- The cabin remained intact and therefore made the accident survivable.

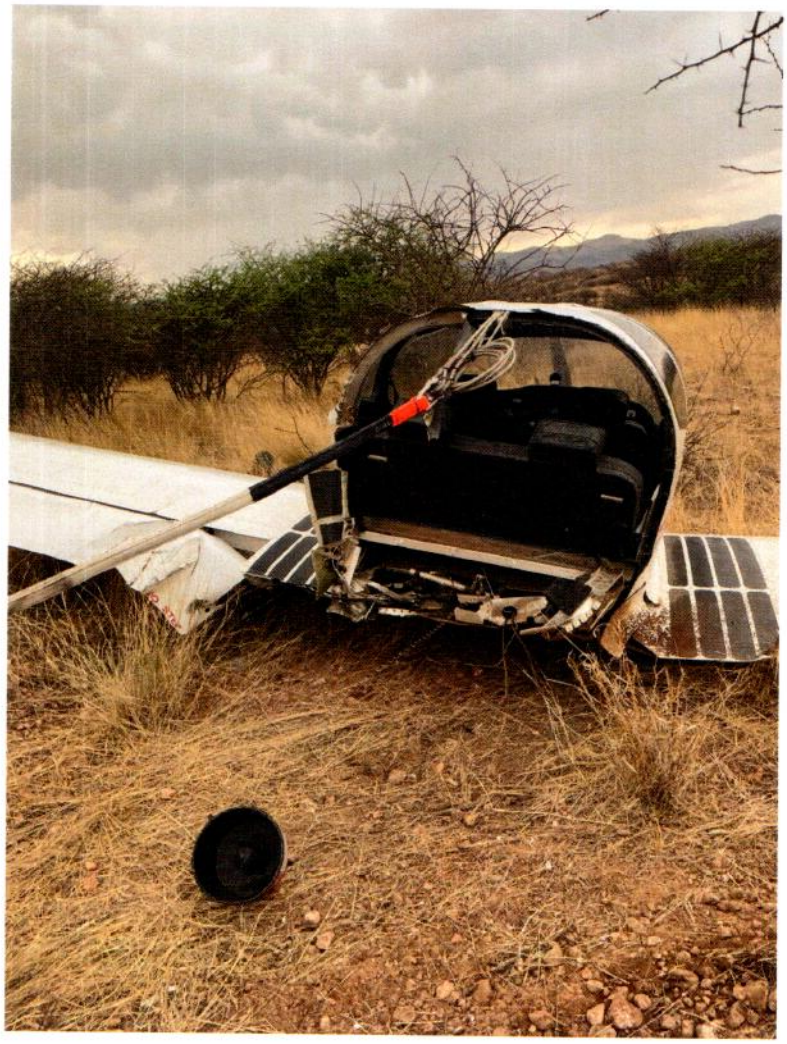

Image 7- The interior (including the seats) of the cabin remained intact.

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1.16 Tests and research

1.16.1 DAAII and a local AMO performed a fuel system teardown.

1.16.2 During engine teardown the fuel system was scrutinise for blockages and possible fuel pump failure. One of the none return fuel valves was found stuck in the open position resulting in a reverse fuel flow to the fuel tank.

1.16.3 The fuel pressure loss caused the engine being starved from sufficient fuel flow, resulting in an engine failure.

1.16.4 A technical report was submitted by the local AMO and confirmed the above. See appendix 1.

1.17 Organizational and management information

1.17.1 The aircraft was owned by Signa Aviation Services, based at Eros Airport and was used primarily for Ab'initio pilot training.

1.17.2 The aircraft was acquired by the flight school in December 2016.

1.17.3 The aircraft flew 3800 hours without major incidents.

1.17.4 A major 4000-hour service was due and would have been carried out by TAF.

1.17.5 The aircraft had a certificate for flight issued at 3696,6 hours on the 08th of October 2021 by the microlight association of Namibia No AI 19.

1.17.6 The Aircraft was on a training flight to the general flying area with an instructor and trainee instructor on board.

1.18 Additional Information

1.18.1 None.

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1.19 Useful or effective investigation techniques

1.19.1 None.

2. ANALYSIS

2.1 On the 15th November 2021 around 11:53 UTC a training flight took off from Eros Airport (FYWE) Windhoek to the GFA with two crew (Instructor and a student instructor) on board. The aircraft was a Sling 4 with Registration V5-USC.

2.2 Sufficient fuel was uploaded for the flight. Four hours of fuel was onboard on takeoff.

2.3 The pilot was the holder of a commercial pilot license with instructors rating endorsed and had a valid medical certificate at the time of the accident. The pilot had a total of 3029.7 flying hours and 2281,5 flying hours on the Sling 4 aircraft at the time of the accident.

2.4 The aircraft was signed out and authorized by the flight school for the training exercise.

2.5 The aircraft was air worthy and the flight folio were found in the aircraft.

2.6 The pilots did not sustain any injuries and vacated the wreckage without any assistance.

2.7 The crew could not resolve the fuel pressure problem and realized that engine failure was imminent.

2.8 The crew informed the Eros ATC of their intentions when the distress call (MAYDAY) was made that they intend to make an emergency landing on a gravel road 3 NM south of ANGOS.

2.9 The Eros Air Traffic Controller did inform the Eros Fire and Rescue Services of the distress aircraft.

2.10 Although there was no need for Eros Fire and Rescue services to respond it was found that during the investigation it was unclear why the Eros Fire and Rescue services did not inform Eros ATC that the accident was outside their area of responsibility and that they are not going to respond nor was it clear why they did not inform City of Windhoek emergency services about the accident.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot was the holder of a commercial pilot license with an instructors rating, validated by the NCAA as per regulation. The pilot's medical certificate was valid at the time of the accident.

3.1.2 The trainee instructor licence was also valid as well as his medical certificate.

3.1.3 The training flight was authorised by the flight school.

3.1.4 The aircraft had a valid released for flight certificate and the aircraft's flight folio and maintenance records did not reveal any recent problem issues or occurrences since the last MPI.

3.1.5 The prevailing weather was light winds with a few clouds and rain in the vicinity. The prevailing weather did not contribute to the accident.

3.1.6 The pilot did not file a flight plan as it not a requirement for local training flights.

3.1.7 Although the Eros Fire and Rescue Services were informed by Eros Air Traffic Control (ATC) about the aircraft in distress, they did not respond nor did they inform Eros ATC that the accident is outside their area of responsibility.

3.1.8 It was also found that the Eros ATC did not follow up with Fire and Rescue services whether they are indeed responding.

3.1.9 The Flying school did activate their ERP and it was well executed.

3.1.10 The engine failure was a result of loss of fuel pressure, due to a none return valve stuck open in the fuel system.

3.1.11 The Instructor Pilot was not able to resolve this issue and executed the emergency landing after the engine failed.

3.2 Contributing factor

3.2.1 Loss of fuel pressure, due to a none return valve stuck open in the fuel system.

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3.3 Probable cause

3.3.1 Engine failure during cruise.

4 SAFETY RECOMMENDATIONS

4.1 NCAA/ANS. Eros Air Traffic Control to review their Emergency Response Plan (ERP). The plan should make provision for Air Traffic Controllers to follow up with emergency services whether Fire and Rescue services indeed responded and that the wreckage has been located and survivors are assisted.

4.2 Namibia Airports Company (NAC) Fire and Rescue services should also review their Emergency Response Plan (ERP). The plan should make provision for Fire and Rescue service personal to inform ATC or other informant that if an accident happens outside their area of responsibility they should inform the ATC/informant as soon as possible that they are not going to respond, but where possible assist the ATC/informant by contacting other emergency services, e.g. City of Windhoek emergency services, who are able to assist and give feedback to the ATC/informant as soon as possible.

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Ben C.A. Engelbrecht

Co-Investigator

Date: 08 APRIL 2022

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Oskar V. Plichta

Investigator-in-charge

Date: 08 APRIL 2022

Released by:

.....

Hon. John Mutorwa (MP)

MINISTER: MINISTRY OF WORKS AND TRANSPORT

Date: 11 APRIL 2022

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Appendix 1

SKY CORE AVIATION (PTY) LTD

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DAAI
Ministry of Works & Transport
Windhoek

24 November 2021

Attn: Mr O Plichta

Dear Sir

Ref: Technical Report on V5-USC

Subject: The above Aircraft was retrieved from the site and transported to our facility for investigation. The engine of above aircraft was reported to have failed in flight prior to impacting the ground, resulting in major damage to the aircraft. A drop in fuel pressure was reported.

Investigation: The wreck was mounted and secured on a platform for investigation. The engine installation was inspected and established that no major impact damage is evident. Oil and coolant level found to be sufficient. The electrical system was found intact and no abnormalities observed. Ignition system is complete and operational. Fuel supply plumbing was not found disconnected or disrupted other than the supply lines from the wing fuel cells, which were cut during retrieval. Fuel selector operation was confirmed correct and fuel line connections appropriate. With initial electric power application all engine parameters reflected normal operation and observable. When the electric fuel pumps were switched on, the main pump operated normal and a supply pressure of 0.26 PSI was obtained. The Auxiliary fuel pump did not switch on with power and it was established that power was available at the pump connector. The Auxiliary fuel pump seems suspect.

The engine was started and operated up to normal power for operation with all parameters indicating normal. Maximum power was achieved, and operation is normal.

The two 'Non-return' valves for the two electric fuel pumps were removed and opened. The rubber valve poppets were found worn and it seems possible for the rubber valve flap to become stuck in the cage, resulting in fuel flowing towards the incorrect side.

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Observation: The tests on the engine and systems above did not reflect any abnormality and the engine was found to operate satisfactory through the power range. The Auxiliary fuel pump did not run with power switched on. ***The two "One-way-valves" are found to be suspect as it seems due to the wear pattern, it could be possible for the valve poppet to get stuck in an open position, thus allowing fuel flow towards the wrong side during pump operation.*** This results in a total loss of fuel pressure to the engine and starvation would follow.

Conclusion: The possible failure of the auxiliary pump and possible disposition of the "one-way" valves was found to be the likely reason for the fuel starvation of the engine. The electric fuel pumps were found to be within required replacement schedule (1000 hours).

Recommendation: The aircraft manufacturer should be involved in the investigation. The one-way vales should be replaced at the same interval as the fuel pumps.

Yours sincerely

P. Keil