AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8959		
Aircraft Registrations	ZS-NJX AND ZU-MMI	**Date of Accident**	14 August 2011		**Time of Accident**	±0830Z	
Type of Aircrafts	Piaggio P166 Albatrosses		**Type of Operation**		Private		
Pilot-in-command Licence Types	Commercial and Private		**Ages**	61 and 57	**Licences Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		Approximately 4286 and 2893 respectively		Hours on Type	Unknown	
Last point of departure	Tzaneen Aerodrome (FATZ) - Limpopo						
Next point of intended landing	Rand Airport (FAGM) - Gauteng						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
On a mountain, approx 500m south-east of Tzaneen, – GPS positions:S24°05,107', E030°11,230' and S24°05,107', E030°11,185; Elev = 5030 ft AMSL							
Meteorological Information	Wind: 160°/03 knots ;Temperature: 14 °C;						
Number of people on board	1+5; and 1+6	**No. of people injured**	0	**No. of people killed**	13		

Synopsis

Two aircraft, ZS-NJX and ZU-MMI, with 6 and 7 people on board respectively, took off from Tzaneen aerodrome (FATZ) on 14 August 2011 at approximately 0820Z, engaged in private flights with the intention of landing at Rand Airport (FAGM) on the same day. As both aircraft had not arrived at Rand Airport at their expected time of arrival, numerous attempts were made to contact the aircraft and these were unsuccessful. The search and rescue mission was initiated to try and locate these aircraft.

The search and rescue mission was based around the area where the aircraft were believed to have had last contact with each other and with other traffic. Unfortunately due to bad weather in and around the area of last contact of these aircraft, they could only be located approximately two days after they had collided with a mountain in the Lekgalametse valley.

Both aircraft were destroyed by post-impact fire and all the occupants of both aircraft were fatally injured.

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Probable Cause

Controlled flight into terrain.

Contributory factor/s

Lack of proper flight planning.

Low clouds.

IARC Date		Release Date	

AIRCRAFTS ACCIDENT REPORT

Aircraft 1= ZS-NJX:

Name of Owner/Operator **:** NJX Partnership.
Manufacturer **:** Piaggio
Model **:** P166S Albatross
Nationality **:** South African
Registration Marks **:** ZS-NJX
Place **:**On a mountain, approximately 40 kilometers South-East of Tzaneen
: GPS position:S24°05,107', E030°11,230'
Date **:** 14 August 2011
Time **:** ±0830Z

Aircraft 2 = ZU-MMI:

Name of Owner/Operator **:** Dominick R.
Manufacturer **:** Piaggio
Model **:** P166S Albatross
Nationality **:** South African
Registration Marks **:** ZU-MMI
Place **:**On a mountain, approximately 40 kilometers south-east of Tzaneen
: GPS position:S24°05,107', E030°11,185
Date **:** 14 August 2011
Time **:** ±0830Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation :

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to establish legal liability****.*

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1. Two aircraft, ZS-NJX and ZU-MMI, took off from Tzaneen aerodrome (FATZ) on 14 August 2011 at approximately 0820Z, engaged in private flights with the intention of landing at Rand Airport (FAGM) on the same day at 1020Z.

1.1.2. ZU-MMI took off first and on board this aircraft was the pilot accompanied by six passengers. It was shortly afterwards followed by ZS-NJX which had on board the pilot accompanied by five passengers.

1.1.3. The aircraft flew in formation and ZS-NJX was leading the formation.

1.1.4. The search and rescue mission was initiated after both aircraft failed to arrive at their intended destination.

1.1.5. The search and rescue mission was based around the area where the aircraft were believed to have had last contact with each other or with other traffic.

1.1.6. Unfortunately due to low cloud in and around the area of last contact of these aircraft, they could only be located approximately two days after they had collided with a mountain in the Lekgalametse valley.

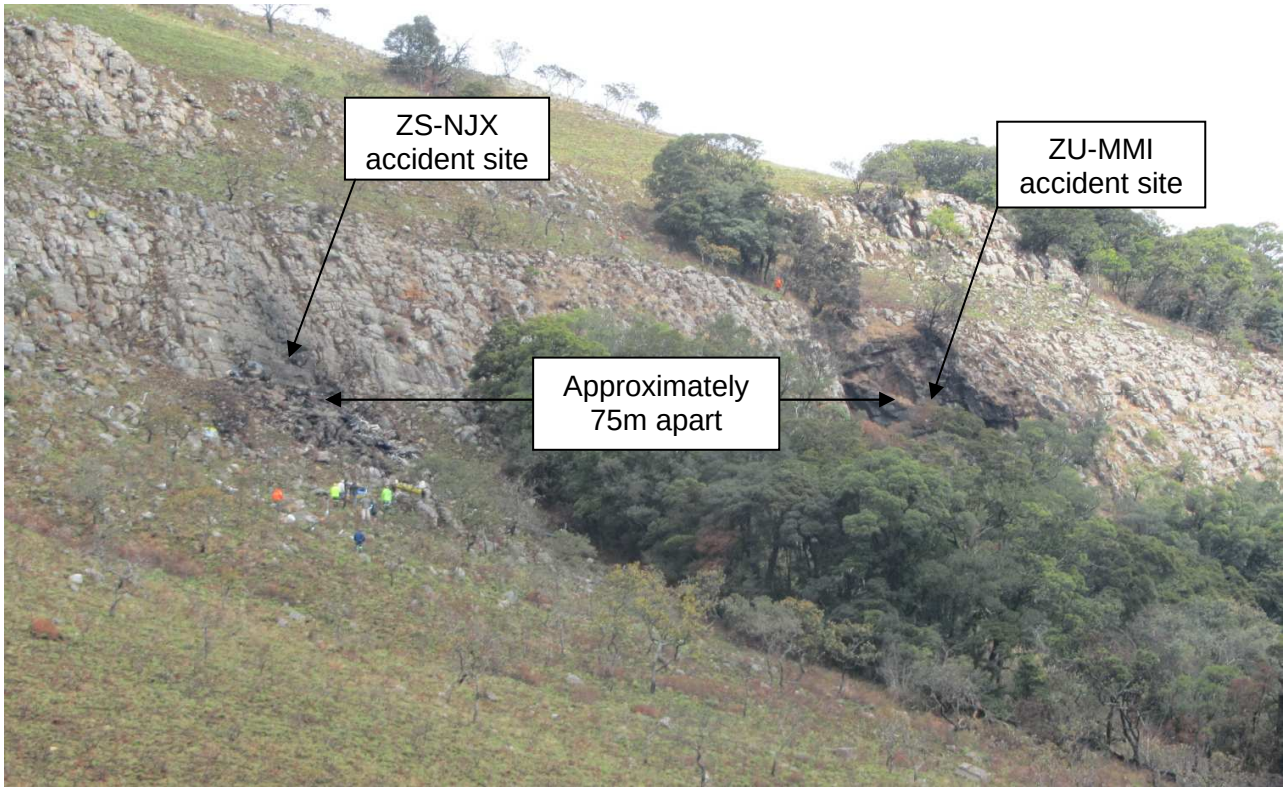


Photo 1: Showing the accident sites of the two aircrafts.

1.1.7. A witness staying in the Lekgalametse Valley area stated that he saw both aircraft momentarily flying over the valley before they dissappeared into the thick, low clouds which were covering the valley. He also stated that he heard a loud bang moments after he saw the aircraft flying overhead him.

1.1.8. Both aircraft were destroyed by fire and all the occupants of both aircraft were fatally injured.

1.2 Injuries to Persons

ZS-NJX

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	5	-
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-

ZU-MMI

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	6	-
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-

1.3 Damage to Aircraft

1.3.1. Both aircraft were destroyed during the accident sequence.

Photo 2: Showing damage to ZS-NJX

Photo 3: Showing damage to ZU-MMI

1.4 Other Damage

1.4.1. There were no other damages.

1.5 Personnel Information

Pilot – ZS-NJX:

Nationality	South African	Gender	Male	Age	61
Licence Number	0270068521	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Grade 2 Instructor, Night and Instrument ratings				
Medical Expiry Date	30 October 2011				
Restrictions	To wear corrective lenses				
Previous Accidents	None				

Flying Experience :

Total Hours	Approximately 4286 hours
Total Past 90 Days	Unknown
Total on Type Past 90 Days	Unknown
Total on Type	Unknown

Note: The hours shown were obtained from SACAA records, and this was the number of hours during the last licence renewal, on 12 January 2011. The pilot's log book could not be found, and his exact flying hours at the time of the accident could therefore not be determined.

Pilot – ZU-MMI:

Nationality	South African	Gender	Male	Age	57
Licence Number	0270083678	Licence Type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Class 2 Test Pilot, Night and Safety Pilot ratings				
Medical Expiry Date	31 October 2011				
Restrictions	To wear corrective lenses				
Previous Accidents	None				

Flying Experience :

Total Hours	Approximately 2893 hours
Total Past 90 Days	Unknown
Total on Type Past 90 Days	Unknown
Total on Type	Unknown

Note: The pilot did not have an instrument flight rating. The hours shown were obtained from SACAA records, and this was the number of hours during the last licence renewal, on 12 November 2010. The pilot's log book could not be found, and his exact flying hours at the time of the accident could therefore not be determined.

1.6 Aircraft Information

1.6.1. Airframe; ZS-NJX:

Type	P166S Albatross	
Serial Number	446	
Manufacturer	Piaggio	
Year of Manufacture	1973	
Total Airframe Hours (At time of Accident)	Approximately 6180.6 hours	
Last MPI (Date & Hours)	12 May 2011	6164.6
Hours since Last MPI	Approximately 15 hours	
C of A (Expiry Date)	19 October 2011	
C of R (Issue Date) (Present owner)	10 November 2009	
Operating Categories	Standard	

Engine 1; ZS-NJX:

Type	Lycoming GSO-480-BIC6
Serial Number	P3466-33
Hours since New	Approximately 3486.6 hours
Hours since Overhaul	Approximately 807.7 hours

Engine 2; ZS-NJX:

Type	Lycoming GSO-480-BIC6
Serial Number	1667
Hours since New	Approximately 4278.2 hours
Hours since Overhaul	Approximately 783.1 hours

Propeller 1; ZS-NJX:

Type	Hartzell HC-A 3V20-2L
Serial Number	AD 279
Hours since New	Approximately 2034.7 hours
Hours since Overhaul	Approximately 453.9 hours

Propeller 2; ZS-NJX:

Type	Hartzell HC-A 3V20-2L
Serial Number	AD 277
Hours since New	Approximately 1792.1 hours
Hours since Overhaul	Approximately 69.3 hours

Note: The hours shown were obtained from SACAA records, as recorded during the last MPI, on 12 May 2011. Although the aircraft's flight folio could not be found, the owners estimated the aircraft to have flown approximately 15 hours since the last MPI.

Airframe; ZU-MMI:

Type	P166S Albatross	
Serial Number	462	
Manufacturer	Piaggio	
Year of Manufacture	1973	
Total Airframe Hours (At time of Accident)	Approximately 4501.3 hours	
Last Annual Inspection (Date & Hours)	05 November 2010	4475.3
Hours since Last Annual Inspection	Approximately 25 hours	
Authority to Fly (Expiry Date)	05 October 2011	
C of R (Issue Date) (Present owner)	06 October 2010	
Operating Categories	Standard	

Engine 1; ZU-MMI:

Type	Lycoming GSO-480-BIC6
Serial Number	1656
Hours since New	Unknown
Hours since Overhaul	Approximately 221.8 hours

Engine 2; ZU-MMI:

Type	Lycoming GSO-480-BIC6
Serial Number	1662
Hours since New	Unknown
Hours since Overhaul	Approximately 822.2 hours

Propeller 1; ZU-MMI:

Type	PO 133/G4
Serial Number	NC6/5560
Hours since New	Unknown
Hours since Overhaul	Approximately 369.2 hours

Propeller 2; ZU-MMI:

Type	PO 133/G4
Serial Number	MP 5508
Hours since New	Unknown
Hours since Overhaul	Approximately 369.2 hours

Note: The hours shown were obtained from SACAA records, as recorded during the last annual inspection, on 05 October 2010. Although the aircraft's flight folio could not be found, the owners estimated the aircraft to have flown approximately 25 hours since the last annual inspection.

1.6.2. Weight and Balance

1.6.2.1. The empty weight and maximum take-off weight for each aircraft is approximately 2750kg and 3680kg respectively. Both aircraft had fuel uplifts from a mobile unit on the aerodrome the morning of 14 August 2011 before the flights. ZS-NJX had approximately 660 litres of fuel at take off (660 x 0.72 = 475.2kg), and the ZU-MMI had approximately 700 litres of fuel at take off (700 x 0.72 = 504kg). The pilot and the passengers on ZS-NJX weighed an estimated, combined total of approximately 448kg, and those on board ZU-MMI weighed an estimated, combined total of approximately 418kg.

ZS-NJX weight at take-off: 2750 + 475.2 + 448 = **3673.2kg**

ZU-MMI weight at take-off: 2750 + 504 + 418 = **3672kg**

The aircraft were therefore considered to have been within their weight limits.

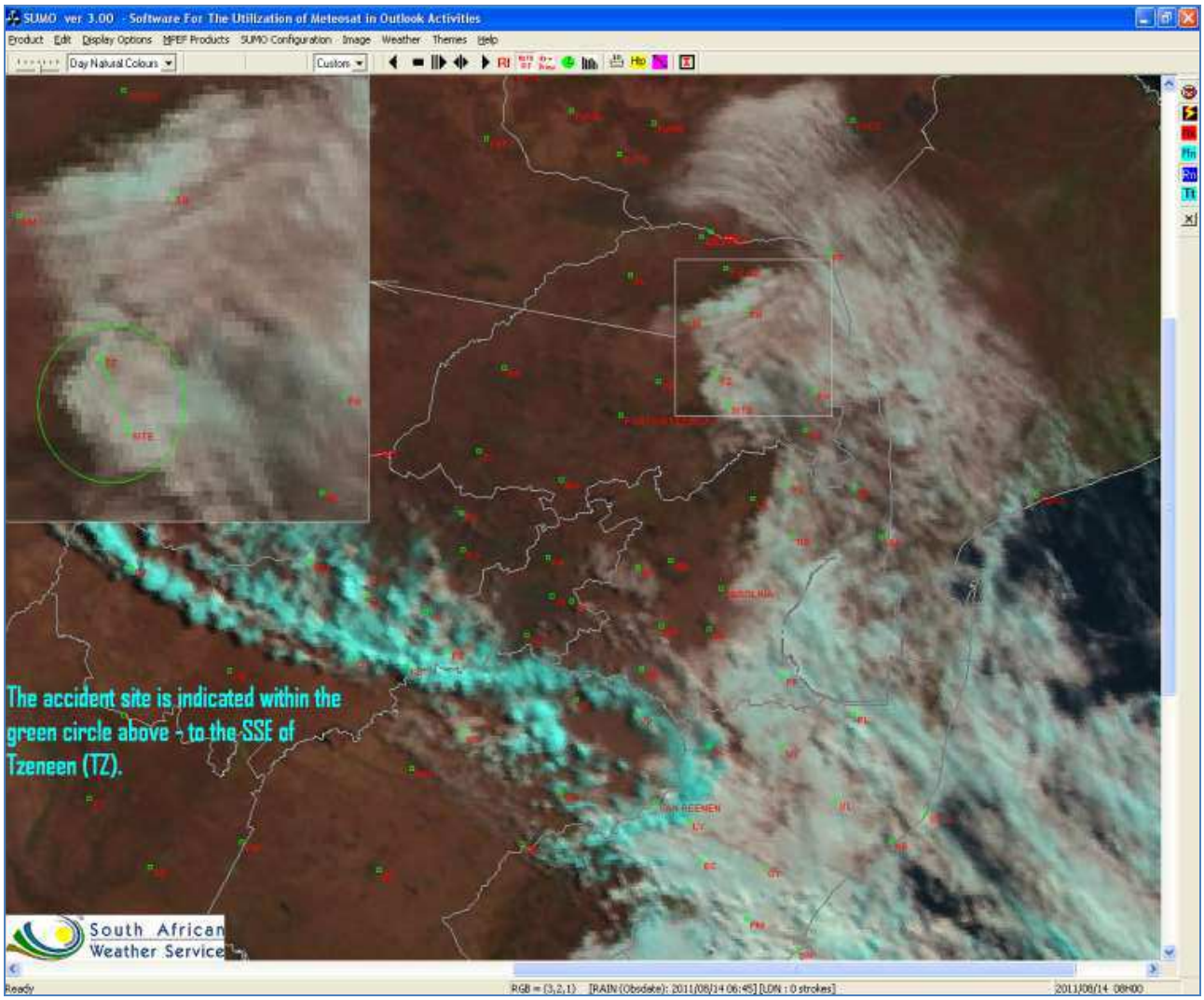
1.7. Meteorological Information

1.7.1. The information given below was obtained from an official weather report given by the South African Weather Services.

Wind direction	160°	Wind speed	03 knots	Visibility	Variable
Temperature	14℃	Cloud cover	Overcast	Cloud base	2000 ft
Dew point	09℃				

1.7.2. SATELLITE IMAGE (0800Z 14 AUGUST 2011)

The satellite image below shows a uniform layer (overcast) of low level clouds (stratiform) over the eastern and north-eastern parts of the country, which extend from the coast up to the escarpment areas. The brown colour indicates the ground (earth surface) while the light (whitish/creamy) shades depict low clouds. Mid-level clouds over the central interior are indicated by the light-blue colour within which convective cells can be identified as the cellular structures within this mid-level cloud band.



1.8 Aids to Navigation

1.8.1. The aircraft were fitted with standard navigation equipment as approved at the time of certification by the regulator, and no defects were entered against these equipment prior to the accidents, or reported during the accident flights.

1.9 Communications.

1.9.1. The aircraft were fitted with standard communication equipment as approved at the time of certification by the regulator, and no defects were entered against these equipment prior to the accidents or reported during the accident flights.

1.9.2. The aircraft were not fitted with emergency locator transmitters (ELT's), and it was not a regulatory requirement for them to be fitted with ELT's.

1.9.3. The pilots were communicating to each other on frequency 124.8 MHz, but there is no evidence of any Mayday calls made before the accident occurred. The investigator in charge was unable to obtain the actual recordings of the communication between these aircraft and other traffic, the available information (a transcript received from the Bushveld Aerospace Control Sector issued and used during the search and rescue mission) indicates that the following communication took place between the two aircraft:

10:29:24 "****, do you have to go through?"
"Do not know what the height is but I suppose we can transit"

10:29:39 "I think I feel better going through"
"OK, I will follow."

Note: The asterix (****) are in place of a name that has been omitted and this was the only time a name was mentioned, but other than that it is not known which words were said by who exactly.

1.10 Aerodrome Information

1.10.1. The accidents did not occur on an aerodrome. They occurred on a mountain, approx 40km southeast of Tzaneen GPS positions:S24°05,107', E030°11,230' and S24°05,107', E030°11,185' respectively, at an elevation of approximately 5030 feet AMSL.

1.11 Flight Recorders

1.11.1. The aircrafts were not fitted with flight data recorders (FDR's) or cockpit voice recorders (CVR's), and none were required by the regulations.

1.12 Wreckage and Impact Information

1.12.1. The aircrafts were heard flying through the escarpment by a witness. The witness stated that after hearing the aircrafts fly in the area, he looked up and saw the aircrafts, moments before they disappeared into the clouds.

1.12.2. ***ZS-NJX***

1.12.2.1. The terrain where the aircraft was found was a steep slope of approximately 60 degrees, with a lot of outcropped rocks and several trees and bushes in the vicinity, but no pre-impact skid or scratch marks were observed on any of the trees, bushes or rocks in the vicinity of the wreckage site.

1.12.2.2. The aircraft's point of impact with the mountain was at a rocky wall with an approximate 90 degree slope, approximately 20 meters below the top of the mountain, before sliding down the mountain a further 10 to 15 meters.

Photo 4: Showing the slope, terrain and impact point of ZS-NJX

1.12.2.3.A post impact fire ensued which destroyed most of the aircraft structure, and a few boulders rolled down from the mountain onto the main wreckage site. The wreckage was fairly localised to the site at which the main wreckage was situated, with most of the debris such as the airframe's skin material, body panels, the engines and propellers found within a 20 meter radius from the main wreckage. The undercarriage was found directly underneath the main wreckage.

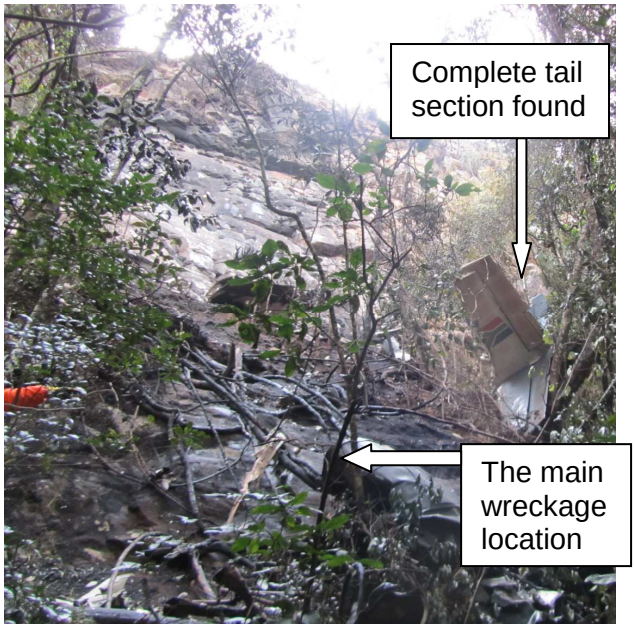
1.12.3. ***ZU-MMI***

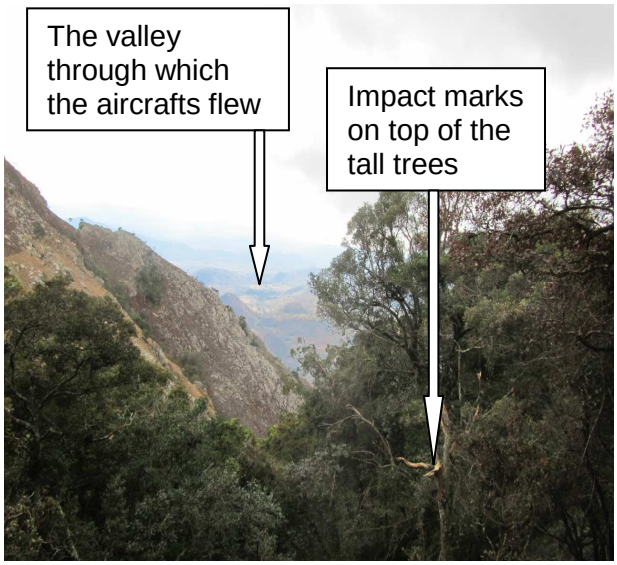
1.12.3.1. The terrain where the aircraft was found was a steep, wet and slippery slope of approximately 80 degrees, with a lot of huge, outcropped rocks, and a lot of tall trees. A lot of pre-impact marks were observed on top of the tall trees, and part of the left wing structure was found stuck on top of the tall trees.

1.12.3.2. The aircraft's point of impact with the mountain was at a rocky wall with an approximate 90 degree slope, approximately 20 meters below the top of the mountain, before sliding down the mountain a further 10 to 20 meters.

1.12.2.3.A post impact fire ensued which destroyed most of the aircraft structure. The tail section was found in a relatively complete condition close to the main wreckage, with one of the engines found approximately a further 30 meters from wreckage down the slope, in between the trees.

Below are different pictures showing a number of components found at the wreckage of ZU-MMI as described above, and the trees hit by the aircraft in the valley through which the aircraft were flying:





1.13 Medical and Pathological Information

1.13.1. The pilots and all passengers of both aircrafts were fatally injured in the accident.

1.13.2. The post-mortem and toxicology reports were not available at the time of compilation of this report. Should these results have a positive bearing to this report, they will be attached to this report as and when obtained.

1.14 Fire

1.14.1. Both aircraft were destroyed by post impact fires.

1.15 Survival Aspects

1.15.1. The accidents were not considered as survivable because of the damages to the aircraft, caused by the effect of the severe impact forces and the post impact fire that ensued.

1.15.2.The aircraft were only located approximately 2 days after the accident had occurred.

1.16 Tests and Research

1.16.1.During examination of the wreckages on the accident site, no anomalies were observed which could have affected the normal operation of the aircraft. The damages on the propellers were indicative of engines which were under power during impact, and all other structural fractures and breakages were those consistent with the impact.

1.17 Organizational and Management Information

1.17.1. ***ZS-NJX***

1.17.1.1.This was a private flight.

1.17.1.2.The pilot had a valid commercial pilot's license (CPL).

1.17.1.3.The aircraft had a valid Certificate of Airworthiness (C of A) with an expiry date of 19 November 2011.The last mandatory periodic inspection (MPI) was certified on 12 May 2011 at 6164.6 airframe hours.

1.17.1.4. The aircraft was privately owned and was maintained by an Aircraft Maintenance Organisation (AMO) approved by SACAA.

1.17.2 ***ZU-MMI***

1.17.2.1. This was a private flight.

1.17.2.2.The pilot had a valid private pilot's license (PPL).

1.17.2.3.The aircraft had a valid authority to fly, with an expiry date of 05 October 2011.The last annual inspection was certified on 05 October 2010 at 4478.3 airframe hours.

1.17.2.4. The aircraft was privately owned and was maintained by an Approved Person (AP) accredited by the Aero Club of South Africa.

1.18 Additional Information

1.18.1. No flight plan was filed for this flight for either of these two aircraft.

1.18.2. There was an airshow and an air race in Tzaneen on 13 August 2011 which most of the occupants of the aircraft were attending. It was not the first time the pilots of both aircraft attended these events in Tzaneen, and they had also flown in and out of Tzaneen on numerous occasions.

1.18.3.The aircraft performed a flat formation display at the airshow, which lasted for approximately 15 minutes.

1.18.4. As the owners of these aircraft are aviation enthusiasts, the aircraft would mostly be used to either carry them and their families to the airshows and air races, or these owners would mainly offer to ferry family members of pilots with single seat aircrafts who would participate in these events, to these events free of charge.

1.18.5. The minimum sector altitude (MSA) for the sector in which these aircraft were flying is 9300ft, and these aircraft collided with a mountain at 5030 ft AMSL. See **Appendix 1 –** a copy of an aeronautical information publication (AIP) leaflet, as published by SACAA, taken as it was at the time of the accident.

1.18.6. The transcript suggests that there was an element of doubt amongst the pilots of the two aircraft as to whether it was safe to fly through the area (valley) or not.

1.18.7. The aircraft were previously used for military operations, under the ownership of the South African Air Force (SAAF).

1.19 Useful or Effective Investigation Techniques

1.19.1. None.

2. ANALYSIS

2.1. These were private flights and the pilots had valid licenses.

2.2. There was no evidence of maintenance anomalies and/or defects with the aircraft prior to the flights reported or experienced by the pilots. No major defects or concerns regarding both aircraft were reported during the MPI and last annual inspection respectively, and these were certified without any noted problems. Observations during the investigation also suggested that the engines were operating normally before the accident, up to the moments of impact.

2.3. There is no available evidence that indicates that there was any communication from either aircraft that there were any problems experienced, or any available evidence that suggests that there were any anomalies with either aircraft or their engines.

2.4. According to the weather report and the witness account, the weather was overcast (low level clouds) on the day of the accident. The witness stated after he briefly saw the two aircraft and after they disappeared into the low clouds, he heard a loud bang. According to the SACAA AIP publication, the MSA for the sector in which these aircraft were flying is 9300ft and the two aircraft collided with a mountain at an altitude of 5030ft.

2.5. The above factors as mentioned coupled to the element of doubt that appears to have existed between the pilots as to whether it was safe to fly through the area or not, creates a strong possibility that the pilots of both aircraft were not aware of the high terrain ahead of them and they subsequently flew into the mountain.

2.6. The two aircraft were subsequently destroyed by post impact fires and all the occupants of both aircraft were fatally injured.

3. CONCLUSION

3.1 Findings

3.1.1. The pilots of both aircraft had a lot of experience, with approximately 4286 and 2893 total flying hours respectively.

3.1.2. Both aircraft were engaged in private flights, carrying passengers that had attended the airshow and air race in Tzaneen that weekend.

3.1.3. The pilots had flown in and out of FATZ on numerous occasions, using this particular type and other different types of aircraft.

3.1.4. The pilot of ZS-NJX had a valid commercial pilot's licence and an instrument rating with a valid medicalcertificate with an expiry of 30 October 2011.

3.1.5. The pilot of ZU-MMI had a valid private pilot's licence and no instrument rating and a valid medical certificate with an expiry of 31 October 2011.

3.1.6. ZS-NJX had a valid Certificate of Airworthiness (C of A) with an expiry date of 19 November 2011.The last mandatory periodic inspection (MPI) was certified on 12 May 2011 at 6164.6 airframe hours.

3.1.7. ZS-NJX was privately owned and was maintained by an Aircraft Maintenance Organisation (AMO) approved by SACAA.

3.1.8. ZU-MMI had a valid authority to fly, with an expiry date of 05 October 2011.The last annual inspection was certified on 05 October 2010 at 4478.3 airframe hours.

3.1.9. ZU-MMI was privately owned and was maintained by an Approved Person (AP) accredited by the Aero Club of South Africa.

3.1.10.No flight plan was filed for this flight for either of the two aircraft.

3.1.11.According to the weather report and the witness account, the weather was overcast (low level clouds) on the day.

3.1.12.The minimum sector altitude for the sector in which these aircraft were flying is 9300ft, and these aircraft collided with a mountain at 5030 ft ASL.

3.1.13.The transcript suggests that there was an element of doubt amongst the pilots of the two aircrafts as to whether it was safe to fly through the area (valley) or not.

3.1.14.The aircraft were previously used for military operations, under the ownership of the South African Air Force (SAAF).

3.2 Probable Cause/s

3.2.1. Controlled flight into terrain

3.3. Contributory factor/s

3.3.1. Lack of proper flight planning.

3.3.2. Low Clouds.

4. SAFETY RECOMMENDATIONS

4.1. None

5. APPENDICES

5.1. Appendix 1

Compiled by: Prince Mereotlhe Date: ……..

For: Director of Civil Aviation

Investigator-in-charge : …… Date: ……..

Co-Investigator : …… Date: ……..

APPENDIX 1

AIP COPY SHOWING MSA