AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9753		
Aircraft Registration	ZS-GBK	**Date of Accident**	19 November 2018		**Time of Accident**	0956Z	
Type of Aircraft	Glider Sailplane- JS1C 21		**Type of Operation**		Private (Part 91)		
Pilot-in-command Licence Type	Sailplane Pilot Licence		**Age**	60	**Licence Valid**	Yes	
Pilot-in-command Flying Experience	Total Flying Hours		4768.02		Hours on Type	87.13	
Last Point of Departure	Gariep Dam Airfield, FAHV, Free State Province						
Next Point of Intended Landing	Gariep Dam Airfield, FAHV, Free State Province						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
The accident occurred at a ridge 1.3 NM north of FAHV at GPS co-ordinates: S30° 33.73'E025°31.79' with an elevation of 4176 ft AMSL							
Meteorological Information	Wind: 018°Gusting 30kts, Visibility: CAVOK, Temperature: 35°C, Dew point: 04°C and Query nautical height: 1013ft						
Number of People On-board	1 + 0	**No. of People Injured**	0		**No. of People Killed**	1	
Synopsis							

On 19 November 2018 at 0943Z, the glider was towed from Runway 33 (RWY 33) at Gariep Dam Airfield (FAHV). According to the tow pilot, there was mild turbulence during the climbing phase of the flight when routing north-west of the airfield. The tow pilot completed one orbit to the left before releasing the glider at 1700 feet (ft) above ground level (AGL).

The glider was observed climbing slowly and routing towards the ridge which is situated directly north of the airfield. At 0954Z, the glider made a right turn with the right wing dropping. The glider stalled and entered a spin for about half a rotation. The glider appeared to be accelerating before impacting the terrain 1.3 nautical miles (NM) north of the airfield. The aircraft was destroyed on impact and the pilot was fatally injured during the accident sequence.

The investigation revealed that it was likely that after the release from the tow aircraft, and while performing a climbing turn in proximity to a ridge line and in mild turbulent weather condition, the glider stalled and entered a spin. However, the pilot could not recover, resulting in the glider impacting the ground.

SRP Date	11 August 2020	Publication Date	12 August 2020

ABBREVIATION	DESCRIPTION
AGL	Above Ground Level
AMO	Aircraft Maintenance Organisation
AMSL	Above Mean Sea Level
CAR	Civil Aviation Regulations
CAVOK	Ceiling and visibility ok
CVR	Cockpit Voice Recorder
FAA	Federal Aviation Administration
FAHV	Gariep Dam Airfield
FDR	Flight Data Recorder
ft	Feet
GDA	Gariep Dam Aviation
GPS	Global Positioning System
kg	kilograms
Kph	Kimometres per hour
KT	Knot
M	Metres
MPI	Mandatory Periodic Inspection
NM	Nautical Miles
QNH	Query Nautical Height
RAASA	Recreation Aviation Administration South Africa
RWY	Runway
SAWS	South African Weather Service
SPL	Sailplane Pilot Licence
SSSA	Soaring Society of South Africa
UKCAA	United Kingdom Civil Aviation Authority
UK AAIB	United Kingdom Air Accidents Investigation Branch

Reference Number	**:**	CA18/2/3/9753
Name of Owner/Operator	**:**	JS-VW Partnership
Manufacturer	**:**	Jonker Sailplanes
Model	**:**	JS1C 18/21
Nationality	**:**	South African
Registration Marks	**:**	ZS-GBK
Place	**:**	Gariep Dam, FAHV, Free State Province
Date	**:**	19 November 2018
Time	**:**	0956Z

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 (CAR) 2011, 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 apportion blame or liability****.*

Investigation process:

The accident was notified to the Accident and Incident Investigations Division (AIID) on 19 November 2018 at about 1056Z. The AIID investigator did not go on site, however, AIID appointed a person from the Soaring Society of South Africa (SSSA) to conduct the investigation as an expert in the aircraft type. The AIID of the South African Civil Aviation Authority (SACAA) is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:
1. Whenever the following words are mentioned in this report, they shall mean the following:

- *Accident – this investigated accident*
- *Aircraft – the JS1C 18/21 Sailplane involved in this accident*
- *Investigation – the investigation into the circumstances of this accident*
- *Pilot – the pilot involved in this accident*
- *Report – this accident report*

2. Photos and figures used in this report were taken from different sources and may be adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

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1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On 19 November 2018 at 0943Z, a glider with the pilot on-board was towed from Runway 33 (RWY 33) at Gariep Dam Airfield (FAHV) in the Free State Province. The tow pilot reported that it was the sixth time on the day that he was towing gliders, but this time, there was mild turbulence during the climbing phase of the flight when routing north-west of the airfield. The tow pilot completed one orbit to the left before releasing the glider at 1700 feet (ft) above ground level (AGL).

1.1.2 The tow pilot reported that he was flying a Cessna 182 tow plane, and towing JS1C ZS-GBK in 21 metre (m) configuration. The weight of the aircraft was 700kg, which was 20kg less than the maximum take-off weight of 720kg. The surface wind during take-off was 310 degrees at 19 knots (kt), gusting at 28kt. Both aircraft took off from RWY 33 at 0943Z. The climb out was at 150 kilometres per hour (kph) as per the (glider) pilot's request. There was mild turbulence during the climb. The tow pilot reported that they climbed out directly to the north, completed one orbit to the left, and then released the glider at 1700 feet (ft) above ground level (AGL) [5800ft above mean sea level]. Thereafter, the tow pilot started a descent and landed the aircraft at 0953Z. The tow aircraft was parked on the apron and the engines were shut down. The total tow time from rotation to release was 10 minutes.

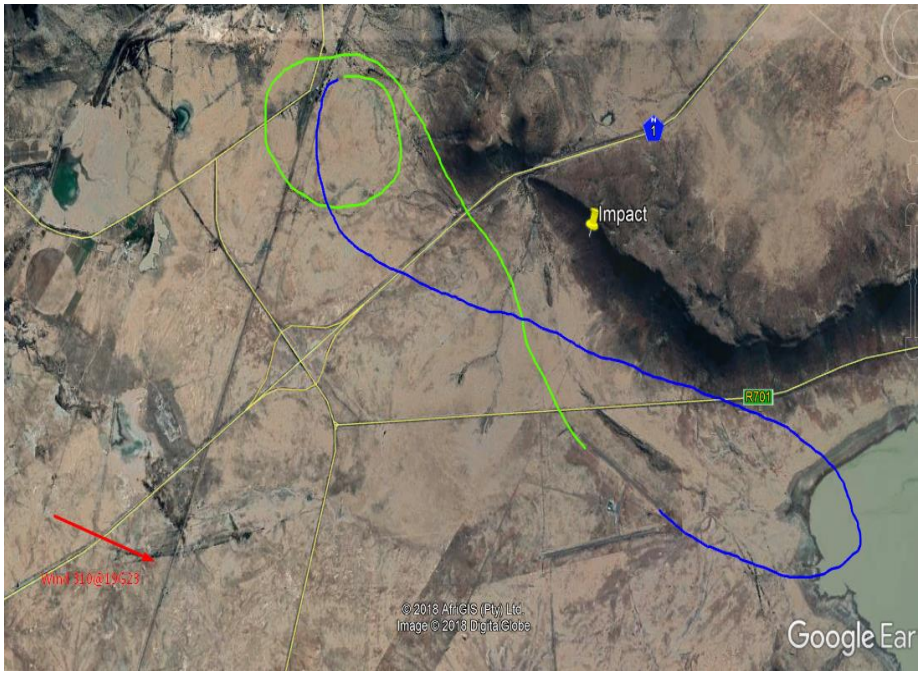

Figure 1: A rough sketch made by the tow pilot of an approximate track of the tow aircraft and glider climb out (green line) and the tow aircraft descent and landing after releasing the glider (blue line).

1.1.3 The tow pilot further reported that upon disembarking the tow aircraft, he walked to the club house from where he watched the glider climb out towards the north. It appeared as if he was climbing slowly but drifting towards the ridge to the north of the airfield. He was about 100m

in line with the top of the ridge (facing the ridge) when he made a right turn towards it. As he started turning, the right wing dropped, and the aircraft entered what seemed like a spin, losing approximately 100m in height. After only about half a rotation, the aircraft appeared to be accelerating and, about a second later, the aircraft impacted terrain at approximately 0956Z. The tow pilot reported that the glider impacted terrain in a nose-down attitude.

1.1.4 The first responders reported that there were white skid marks on several boulders, indicating that the glider slid for about 8 metres after impact. The right wing impacted the ground first. The expert from the Soaring Society of South Africa (SSSA) reported that the rudder cable connection was still intact after the accident. The nose cone had broken off behind the tow hook mechanism and had no indication of damage after impact. The aircraft (fuselage) was destroyed on impact and the pilot was fatally injured during the accident sequence.

1.1.5 The accident took place during daylight visual meteorological conditions at a ridge 1.3 nautical miles (nm) north of FAHV at Global Positioning System (GPS) co-ordinates S30° 33.73'E025°31.79' at an elevation of 4176ft AMSL.

1.2. Injuries to Persons

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

1.3. Damage to Aircraft

1.3.1 The aircraft was destroyed on impact.

Figure 2: The wreckage after impact with terrain.

1.4. Other Damage

1.4.1 None.

1.5. Personnel Information

Nationality	British	Gender	Male	Age	60
Licence Number	218744B	Licence Type		Sailplane Licence	
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Flight Instructor Rating				
Medical Expiry Date	30 December 2018				
Restrictions	Corrective lenses				
Previous Accidents	None				

1.5.1 The pilot's licence was a non-expiring Sailplane Licence (SPL) (No. GBR.FCL.S.218744B.S) issued by the United Kingdom Civil Aviation Authority (UKCAA) on 28 March 2018. The pilot had a flight instructor rating for sailplanes, which was valid until 31 October 2020. His last revalidation was conducted on 21 October 2017 and was valid until 31 October 2020. His Class 1 medical certificate was issued on 18 December 2017 with an expiry date of 30 December 2018. He was restricted to wearing corrective lenses and had to have a spare set of spectacles in his possession.

1.5.2 The pilot applied for an RSA licence validation from the Recreation Aviation Administration South Africa (RAASA) on 11 November 2018, and the validation was issued on the same day with an expiry date of 9 December 2020.

1.5.3 The pilot was an experienced airline pilot with more than 10 000 powered flying hours. He was also a glider pilot and an instructor with 4805.19 flying hours in gliders, including 26 hours on the JS1 and 92 hours on the JS1C.

Glider Flying Experience:

Total Hours	4805.19
Total Past 90 Days	70.41
Total on Type Past 90 Days	27.40
Total on Type	92.01

1.6. Aircraft Information

1.6.1 The Jonkers JS1C is a high-performance composite glider aircraft that can be configured to either 18 or 21 metres wing span. A sailplane is a glider designed to fly efficiently and gain altitude solely from natural forces, such as thermals and ridge waves. The glider had a maximum take-off weight of 720kg and could take 180 litres of water ballast in the wing tanks. The accident flight take-off weight was 700kg. The glider was equipped with turbine sustainer engine mounted behind the cockpit.

1.6.2 The aircraft had undergone a Mandatory Periodic Inspection (MPI) on 5 November 2018 and had flown 37 hours after its maintenance inspection. The pilot had asked one of the aircraft's designers for help with the water leak from the ballast valve the day before the accident flight. The designer checked the ballast valves and found them operational but advised that water be topped up before flight. There were no recorded defects prior to the flight.

1.6.3 The aircraft's flight manual advises the maximum speed to be 146kt and never to be exceeded as operation above this speed may result in structural failure.

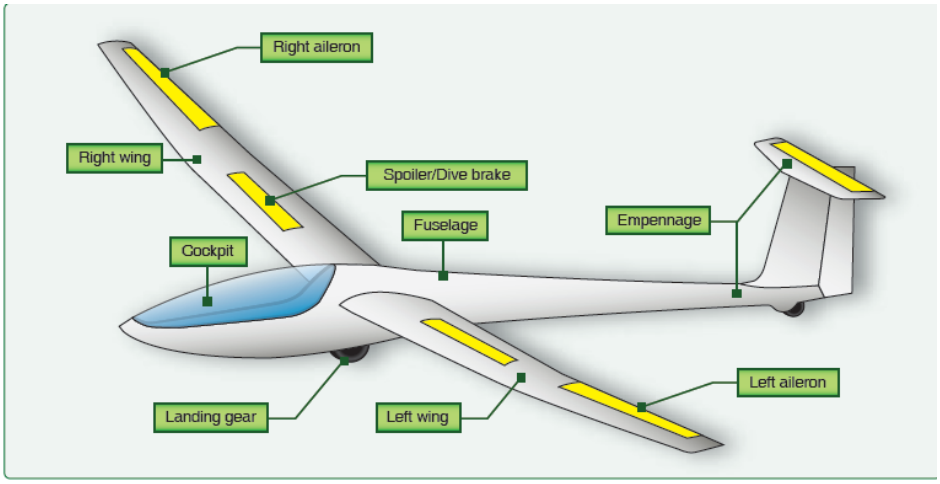

Figure 3: A diagram of a JS1C.

Airframe:

Type	JS1C 21	
Serial Number	1C-059	
Manufacturer	Jonker Sailplanes (Pty) LTD	
Date of Manufacture	2013	
Total Airframe Hours (At time of Accident)	635	
Last MPI (Date & Hours)	5 November 2018	597.49
Hours Since Last MPI	37	
C of A (Issue Date)	13 January 2014	
C of R (Issue Date) (Present owner)	17 January 2018	
Operating Categories	Standard Utility Category Sailplane	

Turbo Charger Fitted to the Glider:

Type	MD-TJ42
Serial Number	MD02-0010
Hours Since New	09.10
Hours Since Overhaul	TBO not reached

1.7. Meteorological Information

1.7.1 The weather report was provided by the South African Weather Service (SAWS) METAR at 1000Z on the day of the accident.

1.7.2 The pilot had flown the accident aircraft on 17 November 2018, two days prior to the accident in similar weather conditions of the day of the accident.

Wind direction	310°	Wind speed	18G30kts	Visibility	CAVOK
Temperature	35°C	Cloud cover	Nil	Cloud base	Nil
Dew point	04°C	QNH	1013		

NOTE: According to the tow pilot, there was mild turbulence during the climbing phase of the flight when routing north-west of the airfield.

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Regulator (SACAA) for the aircraft type and operation. No defects that could render the navigation system unserviceable were recorded before or during the flight.

1.9 Communication

1.9.1 The aircraft was equipped with standard communication equipment as approved by the Regulator for the aircraft type. No defects that could render the communication system unserviceable were recorded before or during the flight. The aircraft was fitted with a Dittel-Avionik KRT2 8.33kHZ VHF transceiver set.

1.10. Aerodrome Information

1.10.1 Gariep Dam is situated at GPS co-ordinates S30° 33.73’ E025°31.79’ at an elevation of 4176ft AMSL. The accident took place 1.3nm north of FAHV.

Aerodrome Location	Gariep Dam Airfield (FAHV)	
Aerodrome Co-ordinates	S30°33.73' / E25°31.79'	
Aerodrome Elevation	4176 ft. (AMSL)	
Runway Designations	10/15	28/33
Runway Dimensions	4298 x 75 ft	3694 x 75 ft
Runway Used	33	
Runway Surface	Hard surface	
Approach Facilities	None	

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 required by regulation to be fitted to this aircraft type.

1.11.2 The aircraft was equipped with an LX9000 flight data logger but was destroyed on impact. A damaged micro SD card was recovered from the logger and sent to the United Kingdom Air Accidents Investigation Branch (UK AAIB) laboratory for analysis, however, it was discovered that it got damaged during the accident (see Figure 5).

Figure 4: The damaged micro SD card with a crack in the middle.

1.12 Wreckage and Impact Information

1.12.1 The aircraft impacted the mountainous terrain at high speed and energy. The wreckage was confined to a small area where the accident occurred. According to the tow pilot, the

approximate elevation of the impact point was 1380m, 100m above airfield elevation.

1.12.2 The investigation was unable to check the continuity of all the flight controls of the glider as they were destroyed by post-impact forces. The SSSA expert who dispatched to the accident site reported that the rudder cable connection was still intact. The damage sustained was a result of post-impact forces and there were no signs of an in-flight break-up. The control stick, the ailerons, the elevators, the rudder pedals, the cockpit and both spoilers were destroyed (see Figures 5 and 6).

Figure 5 and 6: The glider wreckage.

1.12.3 The glider impacted the mountainous terrain and the entire glider wreckage was located in the immediate vicinity of the accident. A linear ground scar, consistent with wing impact, was observed with the left wing of the glider directly over the ground scar and the right wing located a few feet from the ground scar. The glider's aft was broken and the tail was bent upward and to the left, relative to the fuselage. The wreckage was scattered around the accident site.

1.13 Medical and Pathological Information

1.13.1 The pilot's post-mortem report was not available at the time of finalising this report. Should any of the results have a bearing on the circumstances leading to the accident, they will be treated as new evidence and that will necessitate the reopening of the investigation. A review of pilot's medical records revealed no medical condition/s that could have contributed to the accident.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was not considered survivable as the cockpit was destroyed. Although the pilot had been wearing the aircraft safety harness, it had failed during the impact sequence as a result of the disintegration of the aircraft.

1.16 Tests and Research

1.16.1 None.

1.17 Organisational and Management Information

1.17.1 This was a private flight and the aircraft was operated under Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended. The glider was privately owned.

1.17.2 The aircraft was maintained by an aircraft maintenance organisation (AMO) number 1179. The AMO was issued an AMO licence on 15 August 2018 with an expiry date of 30 April 2019. The AMO was approved to work on JS1C glider airframes and engines.

1.18 Additional Information

1.18.1 The following information was sourced from Aerodynamics Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25) and flight manual.

1.18.1.1 *A sailplane is a glider designed to fly efficiently and gain altitude solely from natural forces, such as thermals and ridge waves.*

1.18.2 **Stalls**

1.18.2.1 *It is important to remember that a stall can occur at any airspeed and at any flight attitude. A stall occurs when the critical AOA is exceeded. During a stall, the wings still support some of the aircraft's weight. If the wings did not, it would accelerate according to Newton's Second Law. The stall speed of a glider can be affected by many factors, including weight, load factor due to maneuvering, and environmental conditions. As the weight of the glider increases, a higher AOA is required to maintain flight at the same airspeed since more lift is required to support the increase in weight. This is why a heavily loaded glider stalls at a higher airspeed than when lightly loaded. The manner in which this weight is distributed also affects stall speed. For example, a forward CG creates a situation that requires the tail to produce a greater downforce to balance the aircraft. The result of this configuration requires the wings to produce more lift than if the CG were located further aft. Therefore, a more forward CG also increases stall speed. Environmental factors also can affect stall speed. Snow, ice, or frost accumulation on the wing's surface can increase the weight of the wing, in addition to changing the wing shape and disrupting the airflow, all of which increase stall speed. Turbulence is another environmental factor that can affect a glider's stall speed. The unpredictable nature of turbulence can cause a glider to stall suddenly and abruptly at a higher airspeed than it would in stable conditions. Turbulence has a strong impact on the stall speed of a glider because the vertical gusts change the direction of the relative wind and abruptly increase the AOA. During landing in gusty conditions, it is important to increase the approach airspeed by half of the gust spread value in order to maintain a wide margin above stall. For example, if the winds were*

10 knots gusting to 15 knots, it would be prudent to add 2.5 knots ((15 – 10) ÷ 2= 2.5) to the approach speed. This practice usually ensures a safe margin to guard against stalls at very low altitudes.

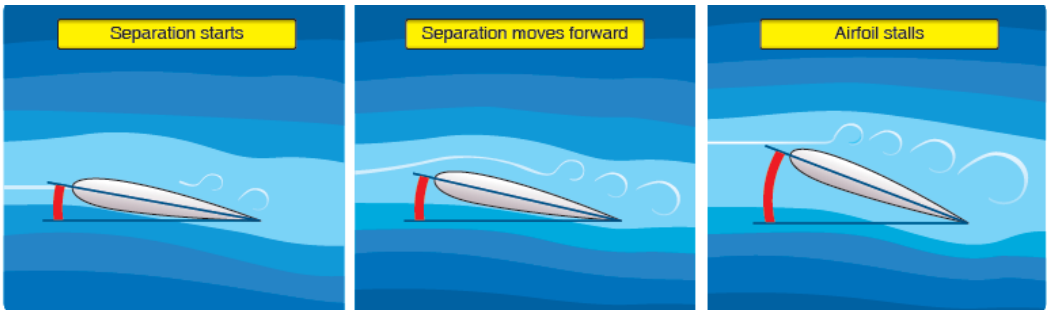

Figure 7: Stall angles of an aerofoil.

*1.18.2.2 **Spins***

If the aircraft is not stalled, it cannot spin. A spin can be defined as an aggravated stall that results in the glider descending in a helical, or corkscrew, path. A spin is a complex, uncoordinated flight maneuver in which the wings are unequally stalled. Upon entering a spin, the wing that is more completely stalled drops before the other, and the nose of the aircraft yaws in the direction of the low wing.

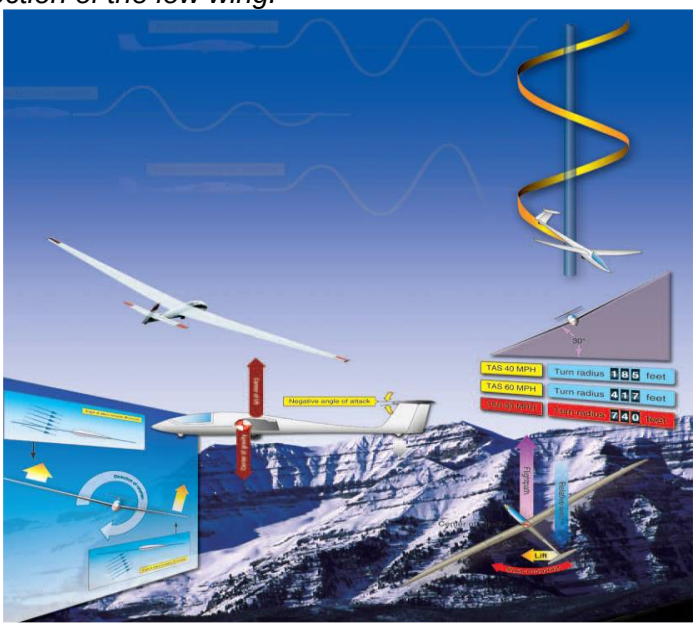

Figure 8: Illustration of a glider entering a spin.

The cause of a spin is stalled airflow over one wing before airflow stalling over the other wing. This is a result of uncoordinated flight with unequal airflows over the wings. Spins occur in uncoordinated slow flight and high rate turns (overbanking for airspeed). The lack of coordination is normally caused by too much or not enough rudder control for the amount of aileron being used. If the stall recovery is not promptly initiated, the glider is likely to enter a full stall that may develop into a spin. Spins that occur as the result of uncoordinated flight usually rotate in the direction of the rudder being applied, regardless of the raised wing. When entering a slipping turn, holding opposite aileron and rudder, the resultant spin usually occurs in the direction opposite of the aileron already applied. In a skidding turn in which both aileron and rudder are applied in the same direction, rotation is also in the direction of rudder application. Glider pilots should always be aware of the type of wing forms on their aircraft and the stall characteristics of that wing in various maneuvers. Spins are normally placed in three categories, as shown in figures below.

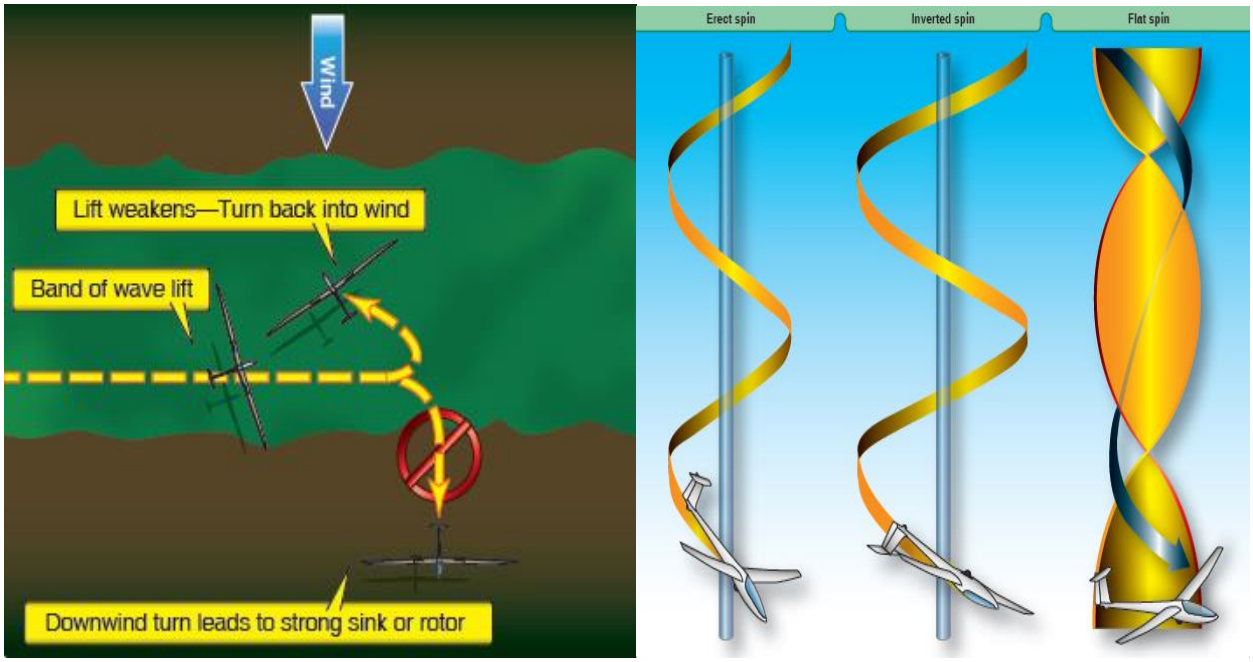

Figure 9: Stall angles of the glider.

The most common is the upright, or erect, spin, which is characterized by a slightly nose-down rolling and yawing motion in the same direction. An inverted spin involves the aircraft spinning upside down with the yaw and roll occurring in opposite directions. A third type of spin, the flat spin, is the most hazardous of all spins. In a flat spin, the glider yaws around the vertical axis at a pitch attitude nearly level with the horizon. A flat spin often has a very high rate of rotation; the recovery is difficult, and sometimes impossible. If a glider is properly loaded within its CG limits, entry into a flat spin should not occur. Erect spins and flat spins can also be inverted. The entry, wing form, and CG usually determine the type of spin resulting from an uncoordinated wing stall. Since spins normally occur when a glider is flown in an uncoordinated manner at lower airspeeds, coordinated use of the flight controls is important. It is critical that pilots learn to recognize and recover from the first sign of a stall or spin. Entering a spin near the ground, especially during the landing pattern, is usually fatal. A pilot must learn to recognize the warning signs, especially during the approach and landing phase in a crosswind. A crosswind resulting in a tailwind on the base leg may lead the pilot to tighten the turn using rudder, or too steep a turn for the airspeed. An uncoordinated turn could lead to the upper wing exceeding its critical AOA before the lower wing, which could result in a very high rate of roll towards the upper wing as the upper wing stalls. If an excessive steep turn is attempted, the glider may roll towards the inside wing or the outside wing depending on the exact trim state at the instant of the stall. Situational awareness of position to final approach should be part of a before-landing routine.

1.18.2.3 Recovery from Spins

Intentional spins on the Jonkers JS1C in the 21-metre wing configuration or with water ballast are strictly prohibited.

According to the flight manual, the recovery procedure is:

- *Full opposite rudder – to reduce the amount of yaw, and indirectly (as a result of roll coupling) to help pitch the nose down.*
- *Centralise the ailerons – to reduce the down wing's Angle of Attack.*
- *Move the stick progressively forwards until the rotation stops – to unstall the glider, even though the nose is already pointing steeply downwards. In powered aircraft it is usual to pause between applying opposite rudder and moving the stick forward. In gliders this isn't necessary.*
- *Centralise the rudder when the rotation stops to prevent a spin in the other direction, and also to prevent high sideways loads on the fin as the speed increases.*
- *Recover from the ensuing dive.*

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

2.2 Man

2.2.1 The pilot was issued a Sailplane Pilot Licence (SPL) by the UKCAA on 28 March 2018. He applied for an RSA licence validation from the RAASA on 11 November 2018 and the validation was issued on the same day with an expiry date of 9 December 2020. His Class 1 medical certificate was issued on 18 December 2017 with an expiry date of 30 December 2018 and a restriction to wear corrective lenses, as well as keep a spare set of spectacles in his possession.

2.2.2 The pilot was an airline pilot with more than 10 000 powered flying hours. He was also a glider pilot and an instructor with 4805.19 flying hours on gliders, including 26 hours on the JS1 and 92 hours on the JS1C. The pilot was also familiar with the area he was operating at as he had flown in that area before.

2.3. Machine

2.3.1 The operation was a private operation carried out under the provisions of Part 91 of the CAR 2011 as amended.

2.3.2 The last annual inspection was carried out on 5 November 2019 at 597.49.0 hours. The aircraft flew 37.5 hours since its last inspection was conducted.

2.3.3 Examination of the wreckage and maintenance documentation revealed no evidence of pre-existing failures that may have contributed to the accident. The wreckage distribution indicated that the aircraft impacted the ground at a high speed.

2.3.4 The accident was not survivable due to the extensive damage on the cabin/cockpit area.

2.4 Environment

2.4.1 The 1000Z METAR (shortly after the time of the accident) indicated that the surface wind was 310 degrees at 18 knots, gusting at 31 knots. The tow aircraft and glider departed RWY 33 at 0943Z. The climb out was at 150 kilometres per hour (kph) in accordance with the glider pilot's request. There was mild turbulence during the climb. Although the reason for stalling and entering a spin was not determined, the prevailing turbulent air conditions may have adversely affected speed control of the glider while manoeuvring in the vicinity of the ridge.

2.5 Investigation Reveal

2.5.1 The investigation revealed that it was likely that after the release from the tow aircraft, and while performing a climbing turn in proximity to a ridge line and in mild turbulent weather condition, the glider stalled and entered a spin. However, the pilot could not recover, resulting in the glider impacting the ground.

3. CONCLUSION

3.1. General

From the available evidence, the following findings, causes and contributing factors were made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusions heading:

- **Findings —** are statements of all significant conditions, events or circumstances in this accident. The findings are significant steps in this accident sequence but they are not always causal or indicate deficiencies.
- **Causes —** are actions, omissions, events, conditions, or a combination thereof, which led to this accident.
- **Contributing factors —** are actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

3.2. Findings

3.2.1 The pilot was issued a Sailplane Licence (SPL) (No. GBR.FCL.S.218744B.S) by the United Kingdom Civil Aviation Authority (UKCAA) on 28 March 2018 which does not expire unless revoked or suspended. His Class 1 medical certificate was issued on 18 December 2017 with an expiry date of 30 December 2018. He was restricted to wearing corrective lenses and also to have a spare set of spectacles in his possession – CA 12-14a 10 October 2018 Page 6 of 9. His last revalidation was conducted on 21 October 2017 with an expiry date of 31 October 2020.

3.2.2 The pilot applied for an RSA licence validation from the Recreation Aviation Administration South Africa (RAASA) on 11 November 2018, and a validation was issued on the same day with an expiry date of 9 December 2020. The pilot complied with validation requirements. The pilot had a total of 4805.19 flight hours of which 92.01 were on the aircraft type. Gariep Dam Aviation (GDA) issued the pilot a foreign pilot validation on 11 November 2018.

3.2.3 The certificate of airworthiness was issued on 13 January 2014 with an expiry date of 31 January 2019.

3.2.4 The aircraft had a valid certificate of registration issued on 17 January 2018.

3.2.5 The last aircraft maintenance mandatory periodic inspection (MPI) was conducted on 5 November 2018 at 597.49 hours. The aircraft had a total of 635 airframe hours at the time of the accident, which meant that it flew a total of 37 airframe hours since its last MPI was conducted.

3.2.6 The flight was conducted in daylight visual meteorological conditions. According to the tow pilot, there was mild turbulence during the climbing phase of the flight when routing north-west of the airfield. The official weather report from the SAWS for the area on the day was ceiling and visibility ok (CAVOK) with wind at 310/18, gusting 30kts.

3.2.7 The pilot's post-mortem report was not available at the time of finalising this report, therefore, it was not possible to determine whether there were any medical issues which could have contributed to the accident. The pilot's aviation medical examination records showed that he did not have any diagnosed medical conditions that could have caused a sudden incapacitation.

3.2.8 The investigation revealed that it was likely that after the release from the tow aircraft, and while performing a climbing turn in proximity to a ridge in mild turbulent weather condition, the glider stalled and entered a spin due to an uncoordinated turn. After approximately half a rotation, the glider subsequently struck the ground.

3.3. Probable Cause/s

3.3.1 It is likely that after the release from the tow aircraft, and while performing a climbing turn in proximity to a ridge in mild turbulent weather condition, the glider entered a spin due to an uncoordinated turn. After approximately half a rotation, it subsequently struck the ground.

3.4. Contributory Factors

3.4.1 None.

4. SAFETY RECOMMENDATIONS

4.1. General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation, and are based on the conclusions listed in heading 3 of this report; the AIID expects that all safety issues identified by the investigation are addressed by the receiving States and organisations.

4.2. Safety Recommendation/s

4.2.1 None.

5. REFERENCES

5.1 Soaring-Safaris - briefing-notes

5.2 https://www.faa.gov/regulations_policies/handbooks_manuals/aircraft/glider_handbook/media/gfh_ch03.pdf

5.3 SAWS report

5.4 Owner questionnaire

5.5 Tow pilot questionnaire

This Report is issued by:

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