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FINAL INVESTIGATION REPORT
ON
ACCIDENT TO M/S JHARKHAND
FLYING INSTITUTE
L-23 SUPER BLANIK GLIDER VT-GLE
AT DUMKA (JHARKHAND)
ON 03 FEB 2020

AIRCRAFT ACCIDENT INVESTIGATION BUREAU
MINISTRY OF CIVIL AVIATION
GOVERNMENT OF INDIA

FOREWORD

In accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO) and Rule 3 of Aircraft (Investigation of Accidents and Incidents), Rules 2017, the sole objective of the investigation of an accident/serious incident shall be the prevention of accidents and incidents and not to apportion blame or liability. The investigation conducted in accordance with provisions of the above said rules shall be separate from any judicial or administrative proceedings to apportion blame or liability.

This document has been prepared based upon the evidences collected during the investigation, opinion obtained from the experts and laboratory examination of various components. Consequently, the use of this report for any purpose other than for the prevention of future accidents or incidents could lead to erroneous interpretations.

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GLOSSARY

AAIB	:	Aircraft Accident Investigation Bureau, India
AMSL	:	Above Mean Sea Level
ARC	:	Airworthiness Review Certificate
ASR	:	Airport Surveillance Radar
ATC	:	Air Traffic Control
AUW	:	All Up Weight
C of A	:	Certificate of Airworthiness
C of R	:	Certificate of Registration
CAR	:	Civil Aviation Requirements
GPL	:	Glider Pilot License
CVR	:	Cockpit Voice Recorder
DFDR	:	Digital Flight data Recorder
DGCA	:	Directorate General of Civil Aviation
ECS	:	Environmental Control System
FO	:	First Officer
FCOM	:	Flight Crew Operating Manual
FCTM	:	Flight Crew Training Manual
FRTOL	:	Flight Radio Telephone Operators License
hrs	:	Hours
IATA	:	International Air Transport Association
ICAO	:	International Civil Aviation Organization
IFR	:	Instrument Flight Rules
ILS	:	Instrument Landing System
LLZ	:	Localizer
MEL	:	Minimum Equipment List
MLG	:	Main Landing Gear
NDB	:	Non-Directional Beacon
NLG	:	Nose Landing Gear
NM	:	Nautical Miles
PA	:	Passenger Address
PF	:	Pilot Flying
PIC	:	Pilot in Command
PM	:	Pilot Monitoring
QRH	:	Quick Reference Handbook
RA	:	Radio Altitude
RESA	:	Runway End Safety Area
SB	:	Service Bulletin
SEP	:	Safety and Emergency Procedures Manual
VFR	:	Visual Flight Rules
VMC	:	Visual Meteorological Conditions
VOR	:	VHF Omnidirectional Range
UTC	:	Coordinated Universal Time

FINAL INVESTIGATION REPORT ON ACCIDENT
TO M/s JHARKHAND FLYING INSTITUTE L-23 SUPER BLANIK
GLIDER VT-GLE ATDUMKA ON 03/02/2020

- | | | |
|--------------------------------------|--------------------|--|
| 1. Aircraft Type | : | L-23 Super Blanik Glider |
| | Nationality | : INDIAN |
| | Registration | : VT – GLE |
| 2. Owner | : | DGCA |
| 3. Operator | : | M/s Jharkhand Flying Institute |
| 4. Pilot – in –Command | : | Glider Pilot License (GPL) Holder |
| | Extent of injuries | : Serious |
| 5. Place of accident | : | Dumka Airfield |
| 6. Date & Time of accident | : | 03 Feb 2020, 1150 UTC (Approx.) |
| 7. Last point of departure | : | Dumka Airfield |
| 8. Point of intended landing | : | Dumka Airfield |
| 9. Geographical location of accident | : | Lat 24°23'09 N, Long 87°26'57 E |
| 10. Type of operation | : | Joyride |
| 11. Passengers on Board | : | 01 |
| 12. Phase of operation | : | Landing |
| 13. Type of accident | : | Crashed during forced landing |

(ALL TIMINGS IN THE REPORT ARE IN UTC UNLESS OTHERWISE SPECIFIED)

EXECUTIVE SUMMARY

On 03rdFeb 2020,L23 Super Blanik Glider VT-GLE owned by DGCA, operated by M/s Jharkhand Flying Institute while undertaking joyride flight met with an accident at Dumka airstrip, Jharkhand at 1150 UTC.

The glider was under the command of pilot holding a valid Glider Pilot License (GPL), with open rating.

The glider was launched approximately at 1145 UTC from Runway 27. After the launch, Glider got released utilising auto release mechanism and attained a height of approx 600 feet AGL. During winch launch, no abnormality was reported neither by the winch operator and nor pilot gave any distress call. Subsequent to launch, pilot tried to land on opposite end of runway i.e. 09 after initiating 180^o turn. While attempting to land, the glider hit the boundary wall and crash landed on unpaved surface within the airstrip. The onboard passenger, occupying the front seat received fatal injury whereas Pilot suffered serious injuries in the accident. The glider was substantially damaged.

Occurrence was classified as Accident as per the Aircraft (Investigation of Accidents and Incidents) Rules, 2017. DG-AAIB issued AAIB Order-Accident vide File No. INV. 11011/02/2020-AAIB dated 4th Feb, 2020 appointing Shri Anil Tewari, Director, AAIB as Investigator-in-Charge and Shri Dinesh Kumar, Assistant Director as Investigator.

Probable Cause

The pilot executed final turn with insufficient speed and excessive application of rudder which caused the glider to stall, coupled with insufficient height to allow recovery.

Hazard Identified During the Investigation

Flying Institute found lacking in enforcing existing glider SOPs.

Consequence

Fatal Accident.

1. FACTUAL INFORMATION

1.1 History of flight

On 03.02.2020, L23 Super Blanik Glider, was engaged in non-planned flying at Dumka airfield when it met with an accident while operating a joy ride flight.

On the day of accident, before operating the first flight of the day, the glider was released for flying after carrying out Pre-flight inspection. CRS was issued by an approved AME.



Figure 1: Dumka Airfield and Accident Site Overview

The accidented flight was the 14th flight of the day. Before the last launch of the day, the glider had completed 13 sorties successfully. The glider was launched for 14th sortie using a stationary ground-based winch machine from runway 27 at approximately 1145 UTC. The glider was under the command of pilot holding a valid Glider Pilot License (GPL) endorsed with open rating.

As per the Base in-Charge, the winch cable hook disengaged normally after glider attained initial launch height of about 200-300 m AGL and the launch was uneventful. After takeoff, glider took a right turn and started losing height. On seeing this, Base in-Charge instructed PIC on hand held RT to go for an emergency landing circuit, but there was no response from PIC on RT. However, few seconds later, the glider took a steep left turn and made an attempt to land at the airfield. During left turn, glider kept on losing height viciously.

The eyewitnesses recalled that the glider was "very low than usual height" and after about more than 45^o (approximately) of turn they felt the left wing drop as the glider

appeared uncontrollable. Few seconds later, glider started losing height rapidly while it was in nose down attitude.

During the event of descent, the left wing of glider touched the boundary wall of airfield and subsequently crash landed on unpaved surface of airstrip.

After the accident, PIC and passenger were rushed to the nearest hospital. The pilot received serious injuries; however, passenger was fatally injured.

1.2 Injuries to Persons

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	Nil	01	Nil
SERIOUS	01	Nil	Nil
MINOR/NONE	Nil	Nil	Nil

1.3 Damage to Aircraft

The glider sustained substantial damages beyond economical repair.

1.4 Other Damage

The barbed fencing wire erected on boundary wall at Dumka airfield was found broken from 2-3 places.

1.5 Personnel Information

1.5.1 Pilot – in – Command

Age : 49 years 4 months
License : GPL Holder
Date of Issue : 28.11.2017
Valid up to : 27.11.2022
Category : Glider
Endorsements as PIC : Open Rating on GPL
Date of Last Medical Exam : 26.12.2019
Med. Exam Valid upto : 26.12.2020
Total flying experience : 470:35 Hrs.
Total flying experience on Type : 06:30 Hrs. / 55 Landings

Last Flown on Type	:	22.01.2020
Total flying experience during last 1 year	:	169:27 Hrs, 818 Landings
Total flying experience during last 180 days	:	61:47 Hrs, 330 Landings
Total flying experience during last 90 days	:	60:37 Hrs, 328 Landings
Total flying experience during last 30 days	:	46:47 Hrs, 272 Landings
Total flying experience during last 07 Days	:	11:12Hrs, 59 Landings
Total flying experience during last 24 Hours	:	00:20 Hrs, 01 Landing
Whether involved in accident/ incident earlier	:	In the past, Pilot was involved in another accident while flying IS-28M2/GR motor glider VT-GJH belonging to Govt. of Jharkhand on 07.08.2013 at Deoghar airstrip.

Note: - During interaction with pilot, the following points emerged regarding accident flight:-

- (i) Pilot did not recall anything about accident.
- (ii) Pilot did not remember why he went for joyride flight along with an AME on board as passenger.

1.6 Aircraft Information

1.6.1 General Information - L23 Super Blanik Glider

Super Blanik L-23 Glider is an all-metal, two-seat, self-supporting, high-winged Glider and is manufactured by M/s. Let Aeronautical Works, Kunovice, Czech Republic. The Glider is certified under Normal Category for VFR day operation. The maximum operating altitude is 10,000 feet and maximum takeoff weight is 510 Kgs. The Super Blanik L-23 Glider has been approved for all stages of flight training from basic to advance cross-country, aerobatic, stunt and instrument flying. Glider length is 27.89 ft, Wing span 53.15 ft, with optional wing tip extensions 59.7 ft, height of this glider is 6.23 ft and wing area is 206.13 sq ft. The glider is approved in the "Utility" category under Training Flight Normal.

Fuselage

The fuselage is of "semi-monocoque" construction with longerons and bulkheads, oval in cross-section. The cockpit is covered with a two-part plexiglass canopy. The rear fuselage

is made of two stiffened semi-monocoque structures and reinforcing bulkheads riveted together.

Wings

The trapezoid-shaped wing with a negative sweep is of all-metal, single-spar construction. Each wing half is connected to the fuselage by means of a vertical main spar pin and a horizontal front spar pin. The fiberglass wing tips have a handy skid. Removable wing tip extensions of one meter each may be installed. Ailerons are of metal structures which are fabric-covered. The spoilers extend both above and below the wing and hook up automatically.

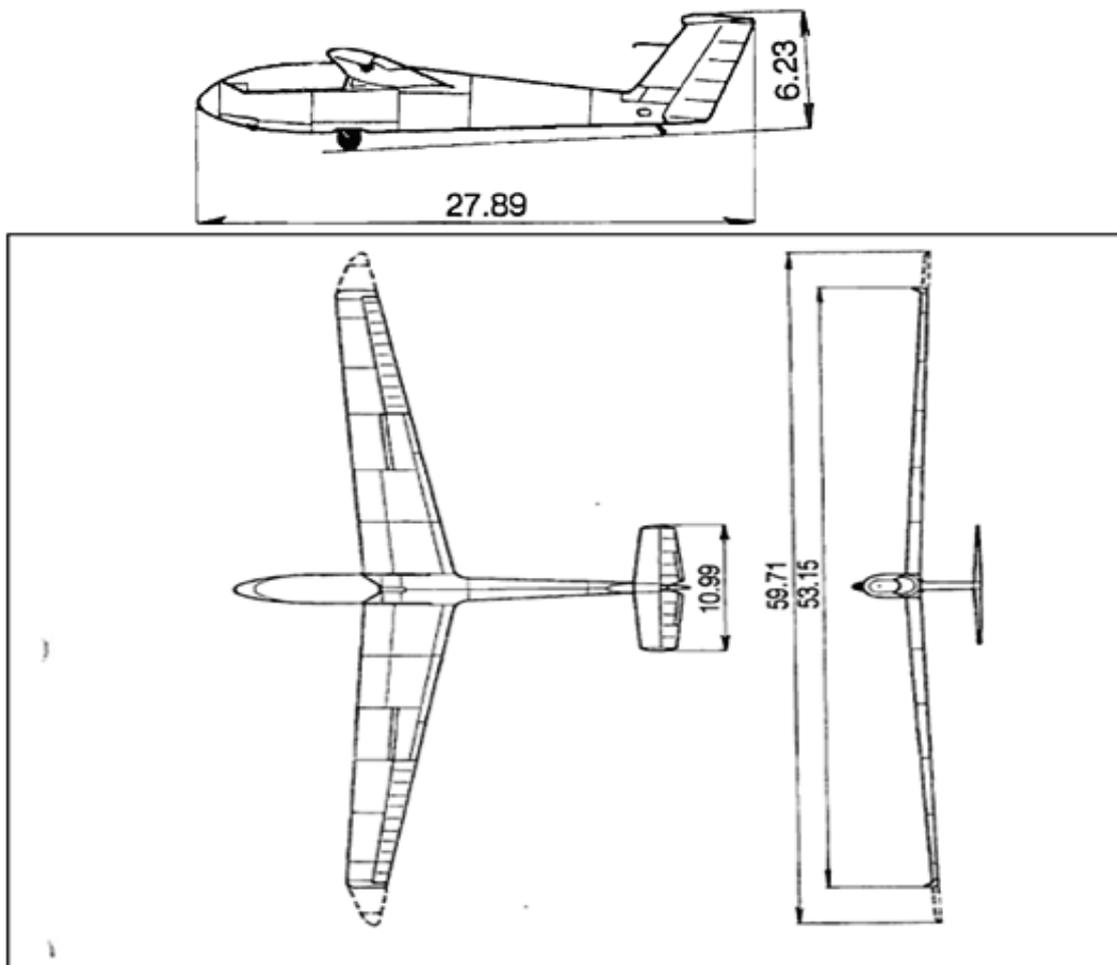


Fig2: Three View Drawing (Dimensions in Feet)

Tail

The one-piece stabilizer of all-metal construction attaches to the fin at three points. The elevator is a metal frame covered with fabric and has two trim tabs. Both the elevator and tabs hook up automatically upon assembly. The rudder's metal frame is Fabric-covered and attaches to the all-metal fin on two mounts.

Flight Controls

The control sticks actuate the elevator and ailerons via a system of levers and rods. The adjustable rudder pedals are connected to the rudder by cables. The elevator is aerodynamically trimmed. A system of levers and torsion rods extends and retracts the spoilers. The L23 is equipped with a front Aero tow hook and side winch/auto tow hooks. A custom, bottom center of gravity tow hook may be built in. Both tow releases are controlled by handles on the instrument panels.

Landing Gear

The landing gear consists of a semi-retractable single wheel, equipped with a drum brake, and sprung by a well-proven oleo-pneumatic shock absorber. The front bottom of the fuselage has a protective steel shoe. The reinforced, fully-swiveling, solid rubber tail wheel has a rubber shock absorber. Optionally, a fixed pneumatic tail wheel may be installed. The wing tips with skids may be replaced by wing tips with built-in faired robust solid rubber tip wheels.

Cockpit

The aircraft has a two-piece canopy, where the front part opens to the right, and the rear part opens upwards and to the rear. The cockpit can accommodate pilots having height between 5'1" to 6'8". The four-point seat belts protect the pilots along with upholstered seats and laminated supports. Two full sets of instruments are installed. The Variometers are attached to the total energy probe mounted in the fin. Fresh air can be let in the cockpit either through the front fuselage vent or through sliding window scoops.

1.6.2 Glider Information: VT-GLE

Glider Model	: L23 SUPERBLANIK
Glider S. No.	: 948209
Year of Manufacturer	: 1994
Name of Owner	: DIRECTOR GENERAL OF CIVIL AVIATION
C of R	: G-289/2
C of A	: 104/G
Category	: NORMAL
C of A Validity	: VALID
A R C issued on	: 19-03-2019

ARC valid up to	: 18.03.2020
Maximum Takeoff weight	: 510 Kg
Date of Aircraft weighment	: 17.08.2011
Empty Weight	: 321.58 Kg
Empty Weight C.G	: 665.47 mm aft of datum
Next Weighing due	: NA
Total Aircraft Hours	: 718:15
Last major inspection	: Carried out 100 hrs/500L ±40L/01 yr inspection
AD, SB, Modification complied	: Complied

The glider was registered with DGCA under the ownership of Govt. of India, DGCA Technical Centre, New Delhi on 17 Feb 2005. The specified minimum operating crew is 01.

The glider was maintained as per the Maintenance Program consisting of Calendar period / Flying Hours or Cycles based maintenance as per maintenance program approved by Regional Airworthiness Office.

All the concerned Airworthiness Directive, Service Bulletins and DGCA Mandatory Modifications on this glider have been complied with as on date of event.

Scrutiny of the snag register revealed that there was no written snag pending on the glider prior to the accident flight.

1.7 Meteorological Information

Dumka airstrip is an uncontrolled airstrip; hence no Meteorological Facility is available to provide weather updates. However, the flying instructors collect the weather information online.

Weather was fine with visibility upto 8 Km, clear sky and winds were 5.3 knots NW.

1.8 Aids to Navigation

Other than one wind sock, there is no navigational aid available at Dumka airfield.

1.9 Communications

Pilot was in possession of a hand held radio device to establish communication with ground control.

In accordance to the SOP, ground personnel in possession of handheld RT set tried to contact the pilot, however, no response was received.

1.10 Aerodrome Information

Dumka airstrip is an uncontrolled airfield with runway orientation 09/27.

ARP Co-ordinates	:	24° 13' 54.3" N 87° 16' 04.2" E
Elevation	:	137 m (450 feet)
Runway Orientation and length	:	09/27 and 4000 feet
Runway& Taxi Tracks Markings	:	Non-Standard (not as per Annex. 14)
MET Services	:	Met service not available

Airspace Information

The uncontrolled airspace allocated for glider flying is 1000 meters AGL at Dumka. However, in case of flying above than this level, crew needs to coordinate with Panagarh ATC

1.11 Flight Recorders

Glider was neither fitted with CVR nor with DFDR, which is in accordance with the regulations stipulated by Regulator.

1.12 Wreckage and Impact Information

While the glider was continuously losing height, crew attempted to land back at Dumka airfield. While doing so the left wing of the glider hit the boundary wall of the airfield which is approximately 8 feet high. During first impact, the glider was in left bank condition. At the time of first impact, left wing partially got detached from the wing root. Thereafter, glider collided on the unpaved surface of the airstrip at a distance of approximately 30 feet from the boundary wall. During second impact, glider nose and right wing hit the ground simultaneously. At the time of impact with ground, the glider was on nose down condition and hit the ground.



Fig 3: Tentative Projection of Flight Path Followed by Glider on Google Map



Fig 4: Final Position of Glider VT-GLE at Point of Impact



Fig 5: Points of Impacts (Viewed from Accident Site)

The left wing of the glider hit the boundary wall resulting into barbed fencing damage.



Fig 6: Point of Impact (View from Outside the Airfield)

The glider came to its final rest on its belly at a distance of approximately 16 feet from the point of impact on ground, facing towards the boundary wall.

Examination of wreckage revealed that nose section of glider was completely damaged along with the front canopy. The control stick of forward cockpit was found intact; however, the control stick of rear cockpit was found damaged but intact. Due to impact of left wing with boundary wall, left wing was found intact but got deformed at the point of impact. Tow Release Handle on the front instrument panel was found disengaged from its original position.



Fig 7: Damaged Left Wing



Fig 8: Damaged Right Wing and Tail Section

The Main Landing Gear along with tail skid wheel and all control surfaces (Ailerons, Elevators, Rudder, Trim Tabs and Airbrakes) were found to be intact. However, Vertical Speed Indicator of both instrument panels (front and rear) was found detached from installed locations. Both VSIs were found near the glider. The Variometer installed on the front instrument panel was found to be stuck at maximum sink position.

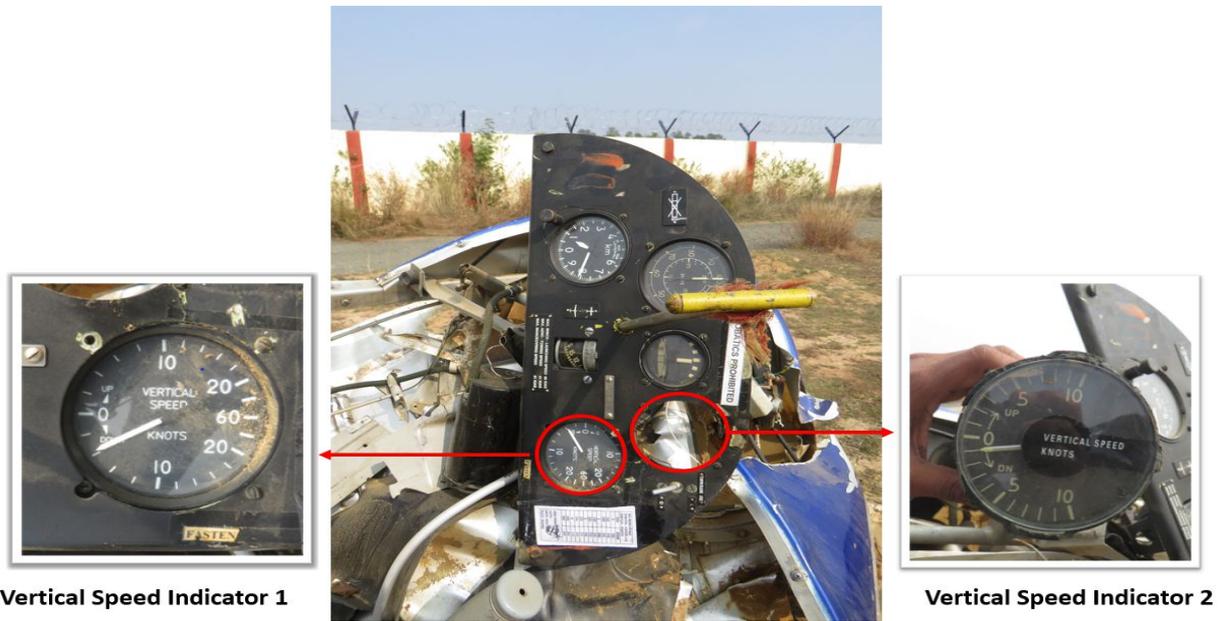


Fig 9: Front Instrument Panel (VT-GLE)



Fig 10: Rear Instrument Panel (VT-GLE)

1.13 Medical and Pathological Information

Before operating the accidented flight, the pilot underwent BA test at Dumka airport. After the accident, the ground control team reached at the accident site. Both onboard occupants were taken to the hospital, however, post flight medical examination could not be carried out owing to their critical condition. In the accident, the AME received fatal injuries.

1.14 Fire

There was no pre and post impact fire.

1.15 Survival Aspects

Immediately after the accident, the winch operator along with other available personnel from the Glider Institute rushed to the site for rescue operation. Initially, the AME who occupied the front cockpit seat was rescued and pulled out from the glider after unlocking the seat harness. The AME was found unconscious by the rescue team.

The rear cockpit seat was found intact. Pilot was rescued from the glider after unlocking the rear seat harness. The pilot was found to be conscious by the rescue team.

1.16 Tests and Research

Nil

1.17 Organizational and Management Information

The Jharkhand Flying Institute (Gliding Wing) was established in 1998 at Ranchi by State Government of Jharkhand (erstwhile Bihar). The institute is operated by Transport Department (Civil Aviation) of Jharkhand State.

The Civil Aviation Department, Government of Jharkhand had a fleet of 07 aircraft i.e. 03 Zlin aircraft, 01 Stemme S6RT Motor Glider, 02 Sinus 912 Motor Glider and 01 unpowered glider L23 Super Blanik.

The Civil Aviation Department is headed by Secretary Transport and who is assisted by Accountable Manager cum Director (Operations). The institute has 04 glider pilot instructors and 01 Examiner.

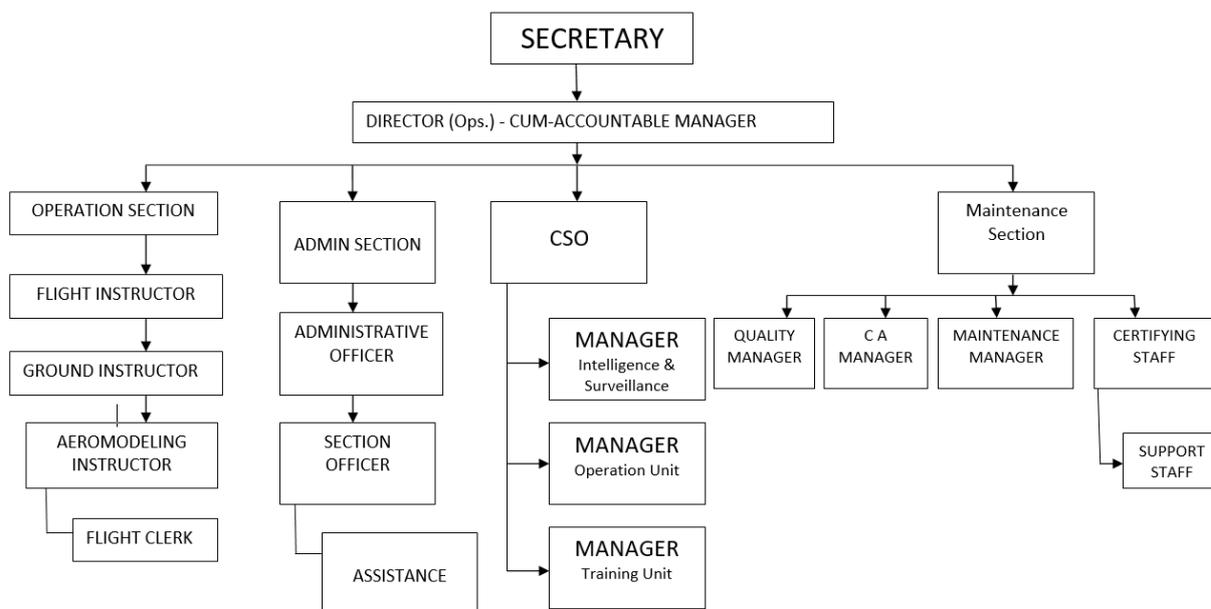


Fig: 11 Organizational Chart

The maintenance of the glider was outsourced to M/s SAPL (M/s Shaurya Aeronautics Pvt. Ltd.) based at New Delhi.

The SOP on Glider Operations formulated by Jharkhand Flying Institute is not inline with DGCA Circulars on Gliding Operations.

1.18 Additional Information

1.18.1 Standard Circuit Pattern

As per the SOP on "Standard Circuit Pattern", following are the guidelines laid down to operate a glider at Dumka airfield:-

- (a) The standard circuit shall be a rectangular circuit with landings into wind. Deviations from the standard circuit may be made to facilitate training exercises (e.g. crosswind landing practice) and should be advised by radio to alert other traffic of the pilot's intentions and circuit/landing direction.
- (b) When landing out, pilots are expected to carry out a standard circuit of their intended landing area.
 - (i) Below 3000 feet AGL, pilots are expected to be actively looking for potential land out areas and moving towards a safe land out area.

(ii) Below 2000 feet AGL- a suitable landing site should be selected and the pilot should plan the potential circuit and options.

NB: always stay within range of the chosen landing site to enable a safe circuit to be carried out.

(iii) Below 1000 feet AGL, make the decision to land- ideally plan the circuit so that the final turn is made not less than 300' above the surface of the chosen site.

(c) Pilot should aim to land no closer than one wingspan from any obstruction. Their approach and landing line should take them clear of any such obstruction.

(d) After flying pilots are to ensure that their flight has been recorded correctly on the flight authorisation log book.

(e) Pilots are reminded that, after landing, it is good practice to not release harness until clear of the cockpit.

(f) The preferred method of communication when winching is via flags (to avoid confusion, avoid rouge radio interference and hence maximize safety).

(g) A circuit plan is attached showing vectors, circuit direction, airfield frequency and other information.

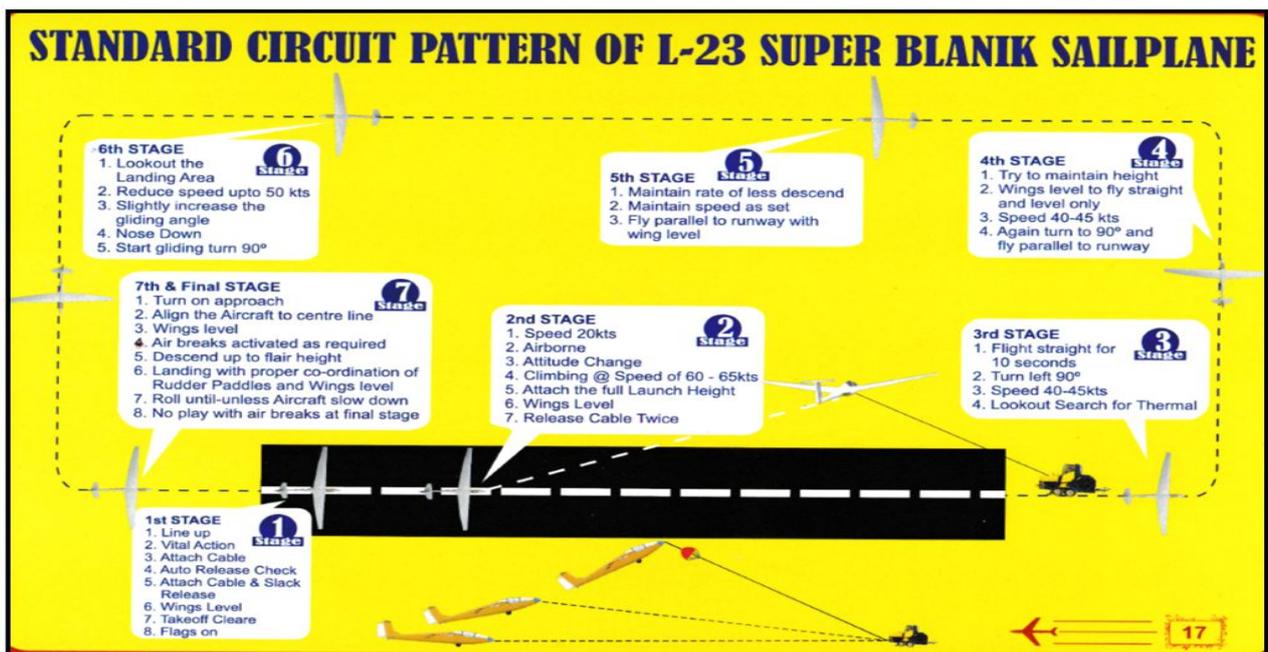


Fig: 12: Circuit Diagram

1.18.2 SOPs and Circulars

1.18.2.1 SOP for Pilots While Carrying Passengers

The extract of SOP of M/s Jharkhand Flying Institute is reproduced below:-

- (a) Indemnity Bond must be signed by passengers.
- (b) Normal circuit or general flying shall be conducted with passenger on board.
- (c) No aerobatics to be undertaken at any situation.

1.18.2.2 Glider Circulars issued by DGCA

- (a) Relevant extract from DGCA Gliding Circular No. 13 of 1981 which contains guidelines on general safety precautions - Glider Flying is reproduced below:-

"Steep turn should be avoided at low height"

- (b) Relevant extract from DGCA Gliding Circular No. 14 of 1981 which contains guidelines on safety precautions - joyride flights in glider, is reproduced below:-

"Before undertaking a joyride flight, as far as practicable, all flight controls should be made inaccessible to the passenger and the passenger should be briefed not to touch any control."

- (c) DGCA Gliding Circular No. 24 of 1981 on Stalling on Approach is reproduced below:-

Stalling on final approach is one of the common cause of accident, specially on high performance glider. Stall may occur when:-

- (i) *The pilot finding himself overshooting, attempts a 360^o turn during the final approach.*
- (ii) *The pilot finding himself overshooting, specially during strong wind conditions, reduces his speed.*
- (iii) *The pilot finding himself under shooting reduces his speed and tries to overcome the under shooting by such faulty method.*
- (iv) *Flying in strong and gusty wind conditions due to the effect of wind gradient.*
- (v) *While making a downwind landing the pilot feels that he is going too fast as the ground runs past faster than usual and hence reduces his speed.*

- (vi) Executing steep turn at low height with insufficient speed.*
- (vii) Allows his concentration to be distracted by the passenger or some object on the ground and pulls back the control stick unconsciously.*
- (viii) The pilot executes baseline turn or final turn with insufficient speed and excessive application of rudder which causes the glider to stall followed by inadvertent speed.*

To avoid such unfortunate accidents, the pilot must:-

- (a) Positively avoid taking 360 turn on the final approach.*
- (b) Correct the overshooting by opening the air brakes/ spoiler at more suitable point.*
- (c) In case of undershooting, the speed, instead of reducing, should be increased by 5 miles and the spoilers/ air brakes should be closed fully. Reducing speed causes poor penetration.*
- (d) Increase approach speed by 5 miles per hour and make 300 ft- 400 ft straight approach during strong and gusty wind conditions.*
- (e) Not allow his indicated air speed to decrease while in a downwind approach and landing.*
- (f) Make a straight final approach from the height of not less than 200 feet. Steep turns at low heights should be avoided.*
- (g) Not allow his passenger or any object on the ground to distract his concentration while landing.*
- (h) All turns must be taken with proper speed and correct coordination of rudder and ailerons.*

Note: Circulars on Glider Operations issued by DGCA are of 1981 vintage. Further, they are also not available in public domain for its easy accessibility. The Circulars were obtained from Pune Gliding Centre for investigation purpose.

Before operating the joyride flight, flight controls of passenger (front cockpit) was not removed as per the existing DGCA circulars discussed above.

1.18.3 Handling of Glider in Low Level Final Turns

In his book *Gliding Safety*, Derek Piggott discussed spin related accidents and handling in low level final turns. He wrote that many spin accidents ***“are caused by poor planning, which leads to situations involving difficult maneuvering near the ground, putting pilots under stress so that they make mistakes or fly badly enough to stall and spin in.”***

In addition, he wrote that, when a glider is very low, pilots often use too much rudder in an effort to complete the final turn.

“Over-ruddering during the final turn creates extra drag and height loss, and helps to cause the nose to drop. If the pilot stops the nose from dropping by easing back on the stick instinctively, the speeds will decrease further.”

1.19 Useful or Effective Investigation Techniques

NIL

2. ANALYSIS

2.1 Serviceability of the Glider

It was observed that all relevant certificates of the involved glider were valid on the day of accident. Prior to operating first flight of the day, CRS was issued by AME holding valid ratings on type of aircraft.

Before operating the accidented flight, glider had completed 13 sorties and no snag was reported in any preceding sortie. As per the defect log book records, no snag was pending on the glider.

The glider was maintained as per the Maintenance Program consisting of Calendar period / Flying Hours or Cycles based maintenance as per maintenance program approved by Regional Airworthiness Office, DGCA.

All the concerned Airworthiness Directive, Service Bulletins and DGCA Mandatory Modifications on this glider have been complied with as on date of accident.

From the foregoing, it is evident that serviceability of the Glider was not a contributory factor to the accident.

2.2 Weather

The airstrip at Dumka is an uncontrolled airstrip and no Meteorological Facility is available.

The weather on the day of accident at Dumka was reported fine with no traces of cloud.

From the foregoing, it is evident that weather was not a contributory factor to the accident.

2.3 Glider Handling

The pilot was qualified to operate the flight and held all required ratings. Before operating the joyride flight, flight controls of passenger (front cockpit) was not removed as per the existing DGCA guidelines.

The investigation team interacted with pilot during which it emerged that the pilot did not recall anything about the accident. Pilot did not even remember why he went for joyride flight along with an AME on board as passenger. The circumstances of this accident were analysed with the help of statements of eyewitnesses and other available evidences.

Immediately after the launch, the pilot took right turn instead of usual left hand circuit pattern. Probably, in order to correct the same, he took a steep left turn and attempted to land back. However, it could not be determined why the pilot attempted to land back.

When nearing the ground, pilots are likely to gain an impression of a glider's ground speed by the flow of objects in their peripheral vision and, if landing downwind, the ground speed is likely to be higher than normal. If a pilot does not monitor the ASI when landing downwind, he or she might reduce the indicated airspeed inadvertently in order to achieve the same impression of ground speed as that experienced during normal into-wind landings.

The stalling speed of L 23 Super Blanik Glider is 32kt, but during a final turn flown with a bank angle between 50° to 60° (Such as in this accident flight) this would increase to between 45kt and 50kt. If the final turn was flown at 50° angle of bank, the wing tip would have been 4.86 m (16 ft) below the centreline of the glider.

The glider probably had too little energy to turn directly to the launch point and land safely. For glider pilots to use changes in angles to judge their approach, they must be able to see the point at which they intend to land. The launch point was behind the

pilot of VT-GLE, so it would have been very difficult for him to use this technique to judge the earliest position from which he could turn towards the launch point and not have too much energy to land safely. Although when flying a circuit, ground features might not be useful. In this case, using a pre-planned ground reference point might have prevented the pilot from entering the circuit too early that too when the pilot is sitting at the rear seat.

2.4 Circumstances Leading to Accident

It is most likely that the glider stalled in the final turn with rudder applied and with sideslip present, leading to departure from controlled flight and at too low a height to allow recovery. Most probably, the pilot did not look at the ASI before the aircraft stalled. It is possible, therefore, that pilot inadvertently allowed the glider's airspeed to reduce as he tried to achieve, while attempting to land downwind, the more usual impression of ground speed gained from landing into wind. It was also possible that the pilot began the final turn below the targeted speed. Rudder applied during the turn, would have increased the drag on the glider and, if the pilot eased back on the control column to prevent the nose from dropping, the speed would have decreased further.

The glider's stalling speed would have increased in the turn to approximately 50kt, reducing further the margin above stalling speed. Eventually, the margin was completely eroded and the glider stalled. The investigation could not determine whether the functioning of stall warning system would have activated in sufficient time for the pilot to prevent the stall and complete the landing safely.

During the turn, the pilot may have used small rudder inputs and appeared to scan the glider's attitude, airspeed and flight path. During the final turn, however, rudder was applied throughout. The pilot's scan was limited to ahead and slightly left of the nose and he probably did not monitor the airspeed. It is probable that the alarm experienced by the pilot, alongwith the fact that pilot had to fly the final turn so close to the ground, induced stress that affected his ability to fly within the safety margins available. Hence, it is most probable that the glider had insufficient energy and insufficient height to complete the turn safely due to which it stalled before hitting the airport boundary wall and crash landed inside the airfield.

3. CONCLUSION

3.1 Findings

1. The glider had valid Certificate of Airworthiness.
2. Pilot held valid Glider Pilot License with open rating to undertake the flight as PIC.
3. The Daily Inspection schedule of the glider was carried out by the approved AME and CRS was issued for routine flying operation before operating the first flight of the day.
4. Prevalent weather was reported to be above minima.
5. No abnormality or snag was reported on the glider during preceding flights of the day.
6. The flight was authorised by Instructor In-Charge of the base to carry out joyride flight with a passenger on board.
7. Before operating the joyride flight, flight controls of passenger was not removed as per the existing DGCA guidelines.
8. Passenger had occupied the front seat.
9. After the launch, the cable was released through auto release mechanism which was normal.
10. Immediately after the launch from runway 27, the glider took a right turn instead of following the standard circuit pattern, i.e. left hand circuit pattern.
11. As per witnesses, PIC executed a steep turn at a low height which is non-adherence to the guidelines contained in DGCA Circulars.
12. While the glider was coming for landing, the left wing of the glider hit the boundary wall and thereafter, it crashed on the unpaved surface inside the airfield boundaries.
13. Glider hit the ground in nose dive condition and the passenger who had occupied the front seat received fatal injuries in the accident.
14. The SOP on Glider Operations formulated by Jharkhand Flying Institute is not inline with DGCA Circulars on Gliding Operations.
15. Glider circulars issued by DGCA are not available on DGCA website for ready reference by Glider Training Institutes.

3.2 Probable Cause of the Accident

The pilot executed final turn with insufficient speed and excessive application of rudder which caused the glider to stall, coupled with insufficient height to allow recovery.

4. RECOMMENDATIONS

- (a) Glider Flying Institutes may sensitise their Pilots to adhere to existing Glider Operation Circulars in vogue.
- (b) M/s Jharkhand Flying Institute may revisit and formulate their existing SOP on Glider Operations inline with DGCA Circulars/Guidelines on Glider Operations.
- (c) DGCA may consider publishing of Glider Operation Circulars in public domain (on DGCA Website).
- (d) DGCA may revisit and revalidate the existing Glider Operation Circulars before making it public.



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Date: 27 Jan 2021
Place: New Delhi