



सत्यमेव जयते

**AIRCRAFT ACCIDENT INVESTIGATION BUREAU
GOVERNMENT OF INDIA**

FINAL REPORT ON SERIOUS INCIDENT

INVOLVING

CIRRUS SR-22 AIRCRAFT VT-VDN

OPERATED BY

M/S JSW STEEL LTD.

ON 17.02.2020 AT ERADIKERA, ANANTAPUR, ANDHRA PRADESH

**Jasbir Singh Larhga
Investigator-in-Charge**

**Dinesh Kumar
Investigator**

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 shall be the prevention of accidents and incidents and not to apportion blame or liability. The investigation conducted in accordance with the 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. 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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FINAL REPORT ON SERIOUS INCIDENT INVOLVING CIRRUSS SR-22
AIRCRAFT VT-VDN OPERATED BY M/s JSW STEEL LTD. ON 17/02/2020
AT ERADIKERA, ANANTAPUR, ANDHRA PRADESH

- | | |
|------------------------------|----------------------------------------|
| 1. Aircraft Type | : CIRUSS SR-22 |
| Nationality | : INDIAN |
| Registration | : VT –VDN |
| 2. Owner/ Operator | : JSW STEEL LTD., VIJAYNAGAR |
| 3. Pilot – in –Command | : PPL holder on type |
| Extent of injuries | : Nil |
| 4. Place of Incident | : Eradikera, Anantapur, Andhra Pradesh |
| 5. Date & Time of Incident | : 17 th Feb 2020, 0400 UTC |
| 6. Last point of Departure | : Mysore Airport |
| 7. Point of intended landing | : Vijaynagar Airport |
| 8. Type of operation | : General Aviation |
| 9. Crew on Board | : 01 |
| 10. Phase of operation | : Cruise |
| 11. Type of Incident | : Forced landing |

(ALL TIMINGS IN THE REPORT ARE IN UTC)

SUMMARY

On 17.02.2020, Cirrus SR-22 aircraft VT-VDN owned by JSW Steel Limited while operating a flight from Mysore to Vijaynagar was involved in a forced landing at Eradikera, Anantapur, Andhra Pradesh at about 0400 UTC.

While the aircraft was approximately at 45 NM from the destination airport, PIC felt roughness in engine and simultaneously, observed fuel seepage from top engine cowling. PIC checked all engine parameters and found these within limits. However, PIC observed that the fuel gush along with the engine roughness increased as the aircraft attempted to climb. Thereafter, PIC decided to carry out a forced landing.

After identifying a suitable plain area and assessing its surroundings, PIC executed the forced landing. Aircraft touched down on its main landing gears and rolled for approximately 1013 feet before coming to a halt. PIC along with the passenger evacuated the aircraft safely. There was no fire or any major damage observed on the aircraft.

Occurrence was classified as Serious Incident as per the Aircraft (Investigation of Accidents and Incidents) Rules, 2017. Aircraft Accident Investigation Bureau vide its Order No. INV.12011/5/2020-AAIB dated 19th Feb, 2020 appointed Mr. Jasbir Singh Larhga, Deputy Director as an Investigator-in-Charge and Mr. Dinesh Kumar, Air Safety Officer as Investigator.

Initial Notification of the occurrence was sent to ICAO and the NTSB, USA on 26th Feb 2020 as per requirement of ICAO Annex 13.

1. FACTUAL INFORMATION

1.1 History of the Flight

On 17.02.2020, Cirrus SR-22 aircraft VT-VDN owned by JSW Steel Limited was scheduled to operate a flight from Mysore to Vijaynagar. The flight was for the purpose of positioning the aircraft at its Operations Base in Vijaynagar after undergoing maintenance actions for renewal of ARC at a DGCA approved maintenance facility in Mysore. The flight was operated by a Pilot-in-Command (PIC) holding a valid Private Pilot License (PPL) on type.

As per the statement obtained from the PIC, he reported at base at 0040 UTC for a 0130 UTC departure and carried out the flight planning and pre-flight checks. Aircraft departure was later revised to 0200 UTC due to congestion in Bengaluru airspace. ATC Mysore cleared the aircraft for start-up at 0225 UTC and the aircraft took-off at 0244 UTC with one passenger onboard.

After take-off, the aircraft was cleared for climb to FL65 and came in contact of Bengaluru Radar. During climb, PIC monitored the engine parameters and flight instruments, no abnormality was observed. While at 30 NM short of waypoint BBG, Bengaluru Radar vectored the aircraft to waypoint NELAM via Yelahanka airspace. While flying through Yelahanka airspace, aircraft was asked to descend to FL55 and later cleared again for FL65.

While the aircraft was approximately at 45 NM from its destination airport, PIC felt roughness in engine and simultaneously, observed fuel seepage from top of the engine cowling. PIC checked all engine parameters and found these to be within the limits. However, PIC observed that fuel gush along with the engine roughness increased as the aircraft attempted to gain altitude. Thereafter, PIC decided to carry out a forced landing.

After identifying a suitable plain area and assessing its surroundings, PIC executed the forced landing. PIC tried to give RT call to another aircraft which was in contact with Vijaynagar ATC, however, due to terrain and low altitude, PIC could not make a positive contact on RT with the other aircraft.

As per the PIC statement, landing was planned in to the winds and aircraft landed at about 0400 UTC. After touchdown on barren land, aircraft rolled for approximately 1013 feet before it came to a halt.

Thereafter, PIC switched off the engine and immediately evacuated from the aircraft along with the passenger. None of the occupants suffered any injury.

After evacuating the aircraft, the PIC obtained GPS co-ordinates to identify the location and transmitted the information to his Company Manager (Operations) to activate 'Search and Rescue'.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

The aircraft suffered a small crack of dimension 0.5 inch approx. on the LH main landing gear leading edge fairing. No other external damage was observed on the aircraft.



Fig 1: Aircraft at Forced Landing site



Fig 2: LH Landing gear Fairing

1.4 Other damage

NIL

1.5 Personnel Information

1.5.1 Pilot-In-Command

Age	:	49 years 8 months
License	:	PPL Holder
Category	:	Aeroplane
Validity of License	:	03.04.2028
Endorsements as PIC	:	Cessna-152, Cirrus SR-22
Date of Class I Medical Exam	:	30.05.2019
Validity of Medical Exam	:	04.06.2020
FRTO License Validity	:	18.04.2022
Total flying experience	:	301:00 Hrs
Total flying experience on type	:	143:25 Hrs

Total flying experience during last 180 days	: 11:00 Hrs
Total flying experience during last 30 days	: 11:00 Hrs
Total flying experience during last 07 days	: 11:00 Hrs
Total flying experience during last 24 hours	: 05:00 Hrs

PIC also held a valid CPL and an ATPL(H) but operated the flight using the privileges of his Private Pilot License. He was not involved in any serious incident/accident in the past. PIC was current in flying and had adequate rest as per the Flight Duty Time Limitations (FDTL) requirement prior to operating the incident flight.

1.6 Aircraft Information

1.6.1 Cirrus SR-22 Aircraft

Cirrus SR-22 aircraft is a single engine composite aircraft. The airplane's monocoque fuselage is constructed primarily of composite materials. All flight and static loads are transferred to the fuselage structure from the wings and control surfaces through the four wing attachment points in two locations under the front seats and two locations on the sidewall just aft of the rear seats.

The wing structure is constructed of composite materials producing wing surfaces that are smooth and seamless. Each wing provides attach structure for the main landing gear and contains a 47.25-gallon fuel tank.

The wing is constructed in a conventional spar, rib, and shear section arrangement. The upper and lower skins are bonded to the spar, ribs, and aft shear web forming a torsion box that carries all of the wing bending and torsion loads. The rear shear webs are similar in construction but do not carry through the fuselage. The main spar is laminated epoxy/carbon fibre in a C-section, and is continuous from wing tip to wing tip. The wing spar passes under the fuselage below the two front seats and is attached to the fuselage in two locations. Lift and landing loads are carried by the single carry-through spar, plus a pair of rear shear webs (one on each wing) attached to the fuselage.

The empennage consists of a horizontal stabilizer, a two-piece elevator, a vertical fin and a rudder. The two-piece elevator, attached to the horizontal stabilizer, is made of aluminium. The vertical stabilizer is composite structure integral to the main fuselage shell for smooth transfer of flight loads. The rudder is made of aluminium and is attached to the vertical stabilizer rear shear web at three hinge points.

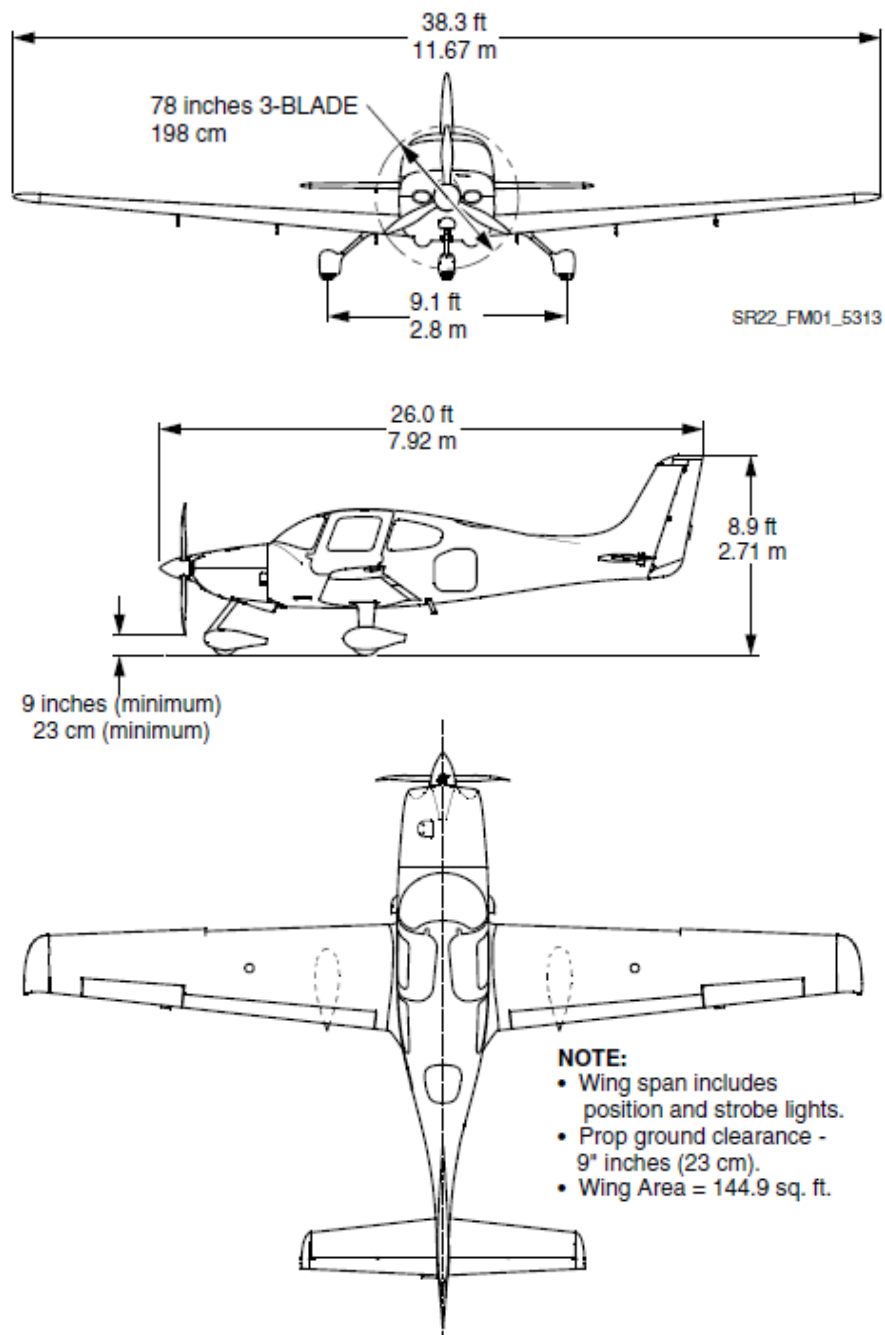


Fig 3: Aircraft Dimensions Diagram

The aircraft is equipped with Teledyne Continental model IO-550-N Engine. The Engine is 6-cylinder, fuel injected air-cooled engine capable of producing 310 HP at 2700 RPM. Total Fuel capacity of the aircraft is 358 Litre.

1.6.2 VT-VDN Information

The Cirrus SR22 aircraft, VT-VDN was issued a Certificate of Registration by DGCA under ownership of M/s JSW Steel Limited. The aircraft was issued Certificate of Airworthiness in “Normal” Category under sub-division “Private”. The technical details of the aircraft are given below: -

Aircraft S. No.	: 2763
Year of Manufacturer	: 2007
Name of Operator	: M/s JSW Steel Ltd
C of R	: No. 3844, Valid till 14.10.2020
C of A	: No. 5053, Valid subject to validity of A R C
ARC Validity	: 25.02.2020
Aircraft Empty Weight	: 1080.00 Kgs
Maximum Take-off Weight	: 1542.00 Kgs.
Date of Aircraft Weighing	: 21.10.2007
Max Usable Fuel	: 306.6 Kgs
Max Payload with full fuel	: 1542.00 Kgs
Total Aircraft Hours	: 479:05 Hrs
Last major Inspection	: Phase II/ 400 hrs / Annual
Engine Type	: Continental IO-550
Date of Manufacture	: 03.01.2020
Engine Sl. No.	: 1038625
Total Engine Hours/Cycles	: 12:50 TSN

The aircraft maintenance was being looked after by M/s Orient Flying Pvt. Ltd. which has a CAR145 approved maintenance facility for SR-22 at Mysore. The aircraft was maintained as per the approved maintenance schedules and all concerned Airworthiness Directives & Mandatory Service Bulletins, DGCA Mandatory Modifications on this aircraft and its engine were complied with as on the date of event.

Earlier, the aircraft had been grounded at Vijaynagar, as its engine had completed its Calendar Period life for overhaul on 28.07.2019. The aircraft and the engine were thereafter preserved. Monthly preservation tasks and maintenance actions were carried out regularly. On 26.01.2020, the unserviceable engine was removed and new engine Sr No. 1038625 was installed on the Aircraft on 03.02.2020. Phase II/400 Hrs inspection was also carried out and certified on 03.02.2020.

The aircraft was Test Flown on 15.02.2020 to check the Engine Performance and all parameters were reported to be normal. Later, on 16.02.2020 the aircraft was flown to Mysore for renewal of ARC which was expiring on 25.02.2020. Radio and ELT Annual Inspection was carried out on the aircraft at Mysore and it was again test flown for purpose of ARC on 16.02.2020.

As per the entries made in JLB, test flight was operated for a block time of 01:30 Hrs. Aircraft took off from Mysore airport at 0635 UTC and landed back at 0805 UTC. During the test flight, no abnormality was found in the aircraft or its engine and performance was found to be satisfactory. All documents and work packages were later submitted to DGCA on 13.03.2020 for renewal of ARC.

The aircraft was scheduled to fly back to its main operations base at Vijaynagar on 17.02.2020. During the said flight, aircraft made a precautionary landing at Eradikera, Anantapur, Andhra Pradesh, which is 45 NM short of Vijaynagar. After notification of incident, a DGCA officer from regional office reached the site and examined the aircraft and the site. Fuel leakage was detected from a blanking nut on the Fuel Flow Divider unit of the Engine. AAIB investigator

also reached the site on 18.02.2020 and also witnessed the leakage. During ground run, the leakage aggravated when Booster Pump was run at a high pressure. The snag was rectified by the AME and permission was obtained by the Operator from DGCA to fly the aircraft back to Vijaynagar.



Fig 4: Blanking Nut Position on Fuel Flow Divider Unit

1.7 Meteorological Information

As per TAF, the weather reported at 0000 UTC at Vijaynagar on 17.02.2020 was “Visibility 6000 meters and 10 Kts winds with bearing 110°”. No Significant weather change was reported by Vijaynagar station.

1.8 Aids to Navigation

Not Applicable, the aircraft carried out forced landing in an open field.

1.9 Communications

The communication frequency available at Vijaynagar is 129.225 MHz and at Yelahanka is 118.1 MHz. However, aircraft was neither in contact with Vijaynagar nor with Yelahanka at the time of execution of forced landing.

1.10 Aerodrome Information

Not Applicable, the aircraft carried out forced landing in an open field.

1.11 Flight Recorders

Aircraft is not equipped with a DFDR or a CVR recorder.

1.12 Wreckage and Impact Information

Aircraft forced landed in an open field at Village Eradikera, District Anantapur, Andhra Pradesh. The coordinates of the incident site are 14° 52' 48" N, 76° 94' 18" E. The aircraft had rolled for a distance of 1013 feet approximately after touchdown. The distance was ascertained by the operator and DGCA officer from the tyre marks available at the site.

A temporary airfield was later created to ferry the aircraft to Vijaynagar. AAIB investigator could not witness the tyre marks as the Operator had already started the work for making a temporary airstrip to ferry the aircraft to Vijaynagar after receiving clearance from DGCA Regional Office.

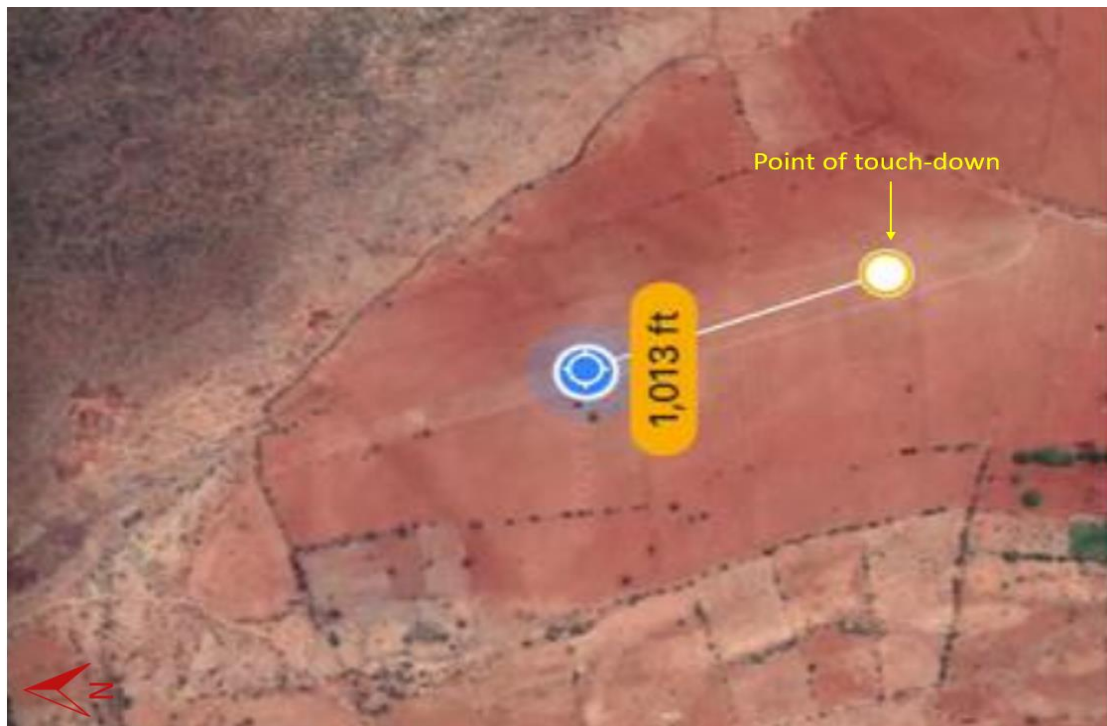


Fig 5: Landing Site (point of touchdown)

Fuel streaks similar to fuel spreading due to wind flow, were seen on the aircraft windshield, right ahead of the Oil Inspection Panel on the Engine Top Cowling. Fuel and Oil levels were found to be satisfactory.



Fig 6: Fuel streaks on Aircraft Windshield



Fig 7: Oil Inspection Panel on Engine Top Cowling

1.13 Medical and Pathological Information

PIC was holding a valid CPL and a PPL with SR22 type endorsement. He was also holding an ATPL(H) and regularly carrying out Helicopter Flying. PIC had obtained Class 1 medical certificate as per CAR Section 7, Series C, Part I for utilizing the privileges of his ATPL(H). The Medical Certificate was valid till 30.06.2020.

As per CAR Section 7, Series C, Part I, PPL holder is required to have a Class 2 medical certification which would be valid up to 2 years, for using the privileges of his license. Since the PIC was having a valid higher-class medical certification, the same can be treated as valid. PIC had undergone post flight Breath Analyser test at the site of occurrence and the same was found to be satisfactory.

1.14 Fire

There was no pre or post impact fire.

1.15 Survival Aspects

The incident was survivable.

1.16 Tests and Research

NIL

1.17 Organizational and Management Information

The aircraft is owned and operated by M/s JSW Steel Limited. M/s JSW Steel Limited is a General Aviation Operator having a fleet of 04 aircraft to meet the travel requirements of Company's officials and its business associates. The details of the aircraft are shown in the table below: -

Aircraft	VT-JSE	VT-OPJ	VT-JSW	VT-VDN
Base	(Mumbai)	(Vijaynagar)		
Type of Aircraft	Bombardier Challenger 300	Cessna Citation Jet 525	Cessna Caravan 208B	Cirrus SR-22

All aircraft including VT-VDN were certified and issued CoA in Private Category. Organisational structure of the Company with regard to Aviation department is shown below: -

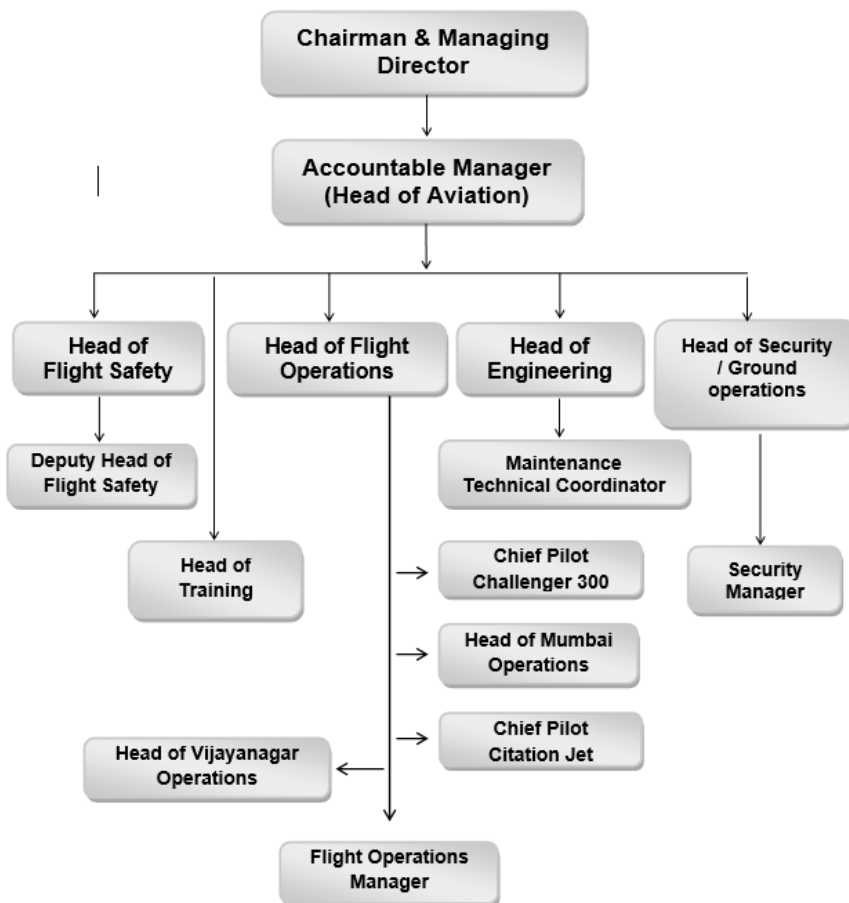


Fig 8: Organisation Chart

1.18 Additional Information

1.18.1 Take-off from Temporary Airstrip

As per the CAR Section 8, Series O, Part III, Operator/PIC must ensure that *“a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the aeroplane, are adequate for the type of operation under which the flight is to be conducted.”*

CAR Section 4, Series B, Part VI which lays the Minimum Safety Requirements for Temporary/Unlicensed Aerodromes also refers to the above-

mentioned condition laid down in CAR Section 8, Series O, Part III. The SR-22 aircraft is primarily built of composites and it was not feasible to dismantle the aircraft for transporting it to its Base. Hence, Operator/PIC took permission from DGCA to take-off from temporary runway made at the site of occurrence and ferry the aircraft to its Base after carrying out snag rectification at Incident Site.

DGCA granted permission to the Operator/PIC to ferry the aircraft to Vijaynagar using the temporary runway in accordance with the limitations laid down in the POH/AFM. As per the POH/AFM, the aircraft was certified for take-off from unpaved (Grass) runways. Take-off ground roll from unpaved (Grass) runway was calculated to be 900 Feet approx. as per the POH/AFM and a temporary runway of 1350 feet X 45 feet dimension was constructed. The aircraft took off from the temporary airfield on 18.02.2020 and safely landed at Vijaynagar.

1.19 Useful or Effective Investigation Techniques

Nil

2 ANALYSIS

2.1 Serviceability of the Aircraft

The aircraft was maintained at a DGCA approved CAR-145 facility at Mysore. The aircraft had undergone replacement of its Engine after being grounded for close to 06 months. The aircraft was preserved and necessary maintenance actions during the period of grounding were carried out on the aircraft.

After Engine Installation on 03.02.2020, the aircraft was Test Flown on 15.02.2020 to check the Engine Performance and all parameters were reported to be normal. Later, the aircraft was flown to Mysore on 16.02.2020 for renewal of ARC which was expiring on 25.02.2020. Aircraft was again test flown for purpose of ARC on 16.02.2020 and no abnormality of any kind was observed on the aircraft or its engine during this flight. Aircraft had flown 12.05 Hrs with the new engine before the fuel leakage from the blanking nut on its Fuel Divider Unit caused it to make a forced landing on 17.02.2020.

During inspection at the site of Forced Landing, fuel seepage was observed from the blanking nut of Fuel Flow Divider Unit. This blanking nut is factory fitted and serves no purpose during any of the maintenance activity carried out on the aircraft or its Engine at its Base.

2.2 Crew Qualifications

The Pilot held a valid Private Pilot License and was meeting higher requirements of Class 1 medical against Class 2 medical prescribed by the CAR. Pilot was qualified and authorised to operate the flight.

2.3 Circumstances Leading to the Incident

The aircraft had undergone engine replacement on 03.02.2020 after being grounded for close to 06 months. Aircraft had flown for 11 hours with the newly fitted engine before the incident flight which included two test flights also. The factory fitted blanking nut of the Fuel Flow Divider unit leaked during the incident flight while the aircraft was cruising at FL65.

PIC noticed the fuel leakage from the Engine cowling and carried out a forced landing at an open field in Village Eradikera, District Anantapur, Andhra Pradesh.

3 CONCLUSIONS

3.1 Findings

- 1) Aircraft had a valid Certificate of Airworthiness and Aircraft was fitted with a brand-new engine on 03.02.2020 after being grounded for close to six months due to expiry of calendar life of its previous engine.
- 2) The aircraft was test flown for checking Engine Performance and also for the purpose of Renewal of ARC. Engine performance was found to be satisfactory in both these flights.
- 3) Fuel leaked from blanking nut of Fuel Divider Unit of engine after 12.05 hours of flying. PIC carried out forced a landing when he observed that fuel leakage and engine roughness was increasing as he tried to climb.

- 4) Aircraft rolled for a distance of approximately 1013 feet on barren land before it halted safely.
- 5) Aircraft had sufficient fuel on board to safely operate the flight to its destination.

3.2 Probable Cause of the Incident

The incident was caused by fuel leakage from the factory fitted blanking nut installed on the fuel divider unit of the Engine.

4. Safety Recommendations

4.1. DGCA and the Operator should follow-up with the OEM for preventive action to prevent reoccurrence of leakage from the Blanking Nut during operations in future.



Dinesh Kumar
Investigator

Date: 23.07.2020
Place: New Delhi



Jasbir Singh Larhga
Investigator-in-Charge