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**FINAL INVESTIGATION REPORT ON ACCIDENT TO
M/S FALCON AVIATION ACADEMY,
CESSNA 152 AIRCRAFT, VT-PTE ON 05.01.2023
AT UMARI VILLAGE NEAR REWA, M.P**

AIRCRAFT ACCIDENT INVESTIGATION BUREAU

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/Incident 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, 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
AD	Airworthiness Directives
AMSL	Above Mean Sea Level
ARC	Airworthiness Review Certificate
ATC	Air Traffic Control
AUW	All Up Weight
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CAR	Civil Aviation Requirements
CPL	Commercial Pilot Licence
CFI	Chief Flight Instructor
CFIT	Controlled Flight Into Terrain
Dy.CFI	Deputy Chief Flight Instructor
DGCA	Directorate General of Civil Aviation
ELT	Emergency Locator Transmitter
FAA	Falcon Aviation Academy
FDTL	Flight Duty Time Limitation
FI	Flight Instructor
FTO	Flying Training Organisation
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
MEL	Minimum Equipment List
MLG	Main Landing Gear
MTOW	Maximum Take Off Weight
NLG	Nose Landing Gear
Nm	Nautical Miles
NOSIG	Not Significant
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
PIC	Pilot in Command
RTR	Radio Telephony Restricted
SB	Service Bulletin
SCT	Scattered
SOP	Standard Operating Procedures
TPM	Training & Procedures Manual
VFR	Visual Flight Rules
VHF	Very High Frequency
VRB	Variable
UTC	Universal Time Coordinated

SYNOPSIS

On 05 January 2023, a Cessna 152 aircraft with registration number VT-PTE owned by M/s Falcon Aviation Academy was involved in a fatal accident during a Night Training sortie in Rewa, Madhya Pradesh. The accident occurred at around 1820 UTC at Umari Village, approximately 0.86NM from Rewa aerodrome.

On the day of the accident, VT-PTE was scheduled for a Night Training sortie with Chief Flight Instructor (CFI) and Student Pilot. The first two sorties conducted under the command of the CFI were uneventful. However, while operating the third sortie during the approach, the crew could not sight the runway due to low visibility. They carried out go around and made another attempt but could not locate the runway. The CFI then decided to divert the aircraft to Varanasi. The CFI had set course to Varanasi, however, the CFI was later informed on RT by ground (Rewa) that there is a NOTAM at Varanasi regarding closure of runway. The CFI turned the aircraft back to Rewa to make one more attempt for landing. The visibility remained poor and despite all the attempts, the crew could not locate the Rewa airfield. In the process, the crew got disoriented and kept on descending the aircraft to identify any visual cues. The aircraft finally crashed at Umri Village approximately 0.86 NM from Rewa Airfield. The CFI received fatal injuries and the student pilot received serious injury. The aircraft was destroyed.

The occurrence was classified as an accident and an investigation was ordered by Director General, Aircraft Accident Investigation Bureau vide order No. INV-11011/01/2023-AAIB dated 06.01.2023 to investigate and determine the probable cause(s) and contributory factor(s) leading to the accident.

Unless otherwise indicated, recommendations in this report are addressed to the regulatory authorities of the State having the responsibility for the matters with which the recommendation is concerned. It is for those authorities to decide what action is taken.

**AIRCRAFT AND ACCIDENT DETAILS OF CESSNA 152
AIRCRAFT VT-PTE ON 05.01.2023**

Type	Cessna 152
Nationality	Indian
Registration	VT-PTE
Owner	M/s Falcon Aviation Academy
Operator	M/s Falcon Aviation Academy
Pilot-in-Command	CPL Holder
Extent of Injury	Fatal Injury
First Officer	SPL Holder (Student Pilot)
Extent of Injury	Serious injury
Passengers on Board	Nil
Place of Accident	Umari Village 0.86 NM south from Rewa Airstrip
Date & Time of Accident	05 January 2023 & 1820 UTC (approx.)
Last point of Departure	Rewa Airstrip
Point of intended landing	Rewa Airstrip
Latitude/Longitude of accident site	Latitude: 24°29'45" N Longitude: 81°13'03" E
Type of Operation	Training Flight (GFT by night)
Phase of Operation	Approach for Landing
Type of Accident	Controlled Flight Into Terrain (CFIT)

1. FACTUAL INFORMATION

1.1 History of Flight

On 05 January 2023, the training flights which were planned as per the roster could not be carried out in the morning due to low visibility. However, later in the day the CFI/Dy.CFI analyzed that the visibility has improved and conducive to flying training, hence, decided to start the flying training operations. Initially, the Dy.CFI authorized 02 aircraft for flight training during day and after completion of these flights, further 02 aircraft were authorized for flying training by day. Thereafter, as per roster, three aircraft were planned for night flying exercises with CFI, Dy. CFI and FI.

There is no MET facility available at Rewa, hence, as a general practice in the organisation MET reports are obtained for nearby stations i.e. Khajuraho, Prayagraj, Jabalpur, and Varanasi airports. The visibility conditions are calculated based on the average value of visibility reported for all these airports. Further, there is a school tower located approximately 2 km from the airstrip towards Runway 25 side which is used as a visual reference before conducting the flight. The METAR obtained from these stations for 1800 Hrs IST suggested that the average visibility was approximately 1700 meters which was well below the required minima for VFR flights. Further, as per the statement of the instructors, the school tower was visible from the apron suggesting approximately 2000 meters of visibility.

As the visibility was not conducive to carry out VFR flights, the CFI, Dy.CFI & FI were deliberating upon the relevant flight Rules/regulations to conduct the night flying in such visibility conditions. As per the statement of Dy.CFI & FI, the CFI after prolonged discussion with them, discussed the issue with someone over phone and thereafter it was decided that only one aircraft will fly under such visibility conditions. Accordingly, CFI decided to carry out the night flying exercise for the students and training flights for Dy.CFI & FI were cancelled. The night flying exercise was planned on the aircraft VT-PTE. Before the aircraft VT-PTE was released for first flight of the day, as per procedure, daily inspection checks were performed by company AME. No abnormality was reported on the aircraft before the conduct of night flying exercise. The CFI planned to carry out two to three night flying exercises. The night flying exercise commenced at around 1915Hrs IST on VT-PTE. The first flight was for renewal of CPL of a pilot (Not from the organisation). As a practice before commencing the flight training exercise the instructor used to intimate Prayagraj. Also, as a practice every instructor used to update the flight details and related information before commencing the flight on a whatsapp group created for flying training operations. Accordingly, CFI before commencing the first night flying exercise updated the flight details on whatsapp and also informed that Prayagraj has been informed about the flight. The flight was GFT by night for 01 hour. Thereafter the CFI carried out GFT by night for a student pilot (having 184hrs of flying training experience) of the organisation on VT-PTE. They took-off at around 2030 hrs IST. They performed a left-hand circuit with two touch-and-go exercises and then they carried out a circuit landing on Runway 07.

Upon completion of the second flight, the CFI planned the next flight with the involved student pilot. The student pilot did preflight checks and the aircraft was also refueled. No abnormality

was observed on the aircraft by the student pilot during pre-flight inspection. The CFI and the student pilot then took off from Runway 07 at around 2150 hrs IST. They made left-hand circuit pattern and did a go around before making two touch-and-go exercises. Thereafter, they were supposed to do full stop landing and accordingly the aircraft landed at around 2230 hrs IST. After landing while the aircraft was backtracking, the CFI decided to carry out one more circuit landing exercise and asked the student pilot to carry out the same. Hence, the CFI with the student pilot took-off again from runway 07 at around 2235 hrs IST. They informed the ground about their intentions only after take-off. Rewa airstrip is an uncontrolled airfield and does not have a dedicated ATC facility. The RT on ground at that time was handled by one of the student pilots of the organisation. As per the statement of the student pilot (communicating on RT from ground) after the aircraft took-off again at around 2235 Hrs IST and when it was abeam the school tower (towards runway 25 side) the aircraft light was becoming hazy due to fog indicating that the visibility was below 2000 meters and deteriorating. The student pilot further stated that when the aircraft was on mid downwind runway 07, the aircraft light was not visible. After completing the circuit during the approach, the crew were not able to sight the runway even after descending to 500 feet AGL and hence carried out a go around. Thereafter, the controls were taken over by CFI.

At around 2250 Hrs IST, the student pilot (on ground) handling RT attempted to confirm the position of the aircraft. The CFI responded that they were unable to locate the runway due to low visibility and asked the student pilot (on ground) to guide them if the aircraft is visible from the ground. The student pilot (on RT) confirmed that visibility is poor & deteriorating and the aircraft is not visible from ground. The CFI then replied that the visibility will improve and they will contact when on finals. Later the student pilot (on ground) heard the aircraft sound coming from the dead side (Sector south) and informed the same to the aircraft.

Thereafter, CFI informed ATC that they are still not able to sight the runway and decided to divert to Varanasi. At around 2300 hrs IST, the CFI contacted the ground to check the visibility, radial, and DME distance of Varanasi Airport from Rewa airstrip and the desired information was provided to the crew by the student pilot (on ground). The visibility reported at Varanasi was 1500 meters, and the student pilot (in Flight) set the GPS coordinates for Varanasi using the ICOM GPS device. By this time the Dy.CFI along with other instructors reached the Rewa airfield after they enquired about the status of the aircraft from the student pilot (on ground). The instructor took the RT set from the student pilot and started communicating with CFI. The CFI advised the instructor to coordinate with Varanasi Tower regarding their arrival since Flight VT-PTE was not in a position to establish communication with Varanasi ATC tower. Simultaneously, the instructor handed over the RT to another instructor and contacted Varanasi ATC tower by landline phone at approximately 2320 hrs IST.

The instructor informed ATC tower, Varanasi that one of their Flight VT-PTE was not able to land at Rewa due to poor visibility and requested landing clearance for the aircraft at Varanasi. Varanasi ATC tower asked details about the flight type, flight rules of the aircraft, and the flight plan. The instructor shared the necessary details, including the endurance of the aircraft, with

Varanasi ATC tower. However, Varanasi tower replied that they had a NOTAM for runway closure. The Varanasi ATC asked instructor to go through the NOTAM and revert.

The instructor then informed the instructor (on RT) to communicate the aircraft that Varanasi airport had a NOTAM for runway closure and they will not be able to accommodate the arrival of VT-PTE. At that time, aircraft VT-PTE was already approximately 8-9 NM outbound from Rewa. After getting the information, the CFI decided to turn the aircraft back to Rewa and try one more attempt to land. The student pilot set the GPS coordinates for Runway 07 of Rewa airstrip and informed Rewa Ground accordingly. At that time, the CFI had the controls and was descending the aircraft to search for any visual cues and lights.

The CFI and Student Pilot, however, could not locate the runway and in order to search for some visual cues they descended further and got disoriented. As per the statements of the instructors who were having RT set at that time, the last call made by the CFI was when they transmitted that they are 0.8 Nm and 200 feet AGL. The instructor (on RT) tried to confirm the position of the aircraft but there was no response from the crew. The Dy.CFI then tried to contact the student pilot via mobile phone, but a local resident from Umari village answered and informed them that the aircraft had crashed in the village. The Dy.CFI and other flight instructors immediately went to the accident site, which was located approximately 0.86 NM south of Rewa Airstrip Runway 07. The CFI was found unconscious, and the student pilot had severe injuries. The CFI and the student pilot were rushed to the nearby hospital, where the CFI was declared dead by the doctors. The student pilot received serious injuries and was later shifted to another hospital for further treatment. The aircraft was destroyed during the accident.



FIG 1: ACCIDENT SITE

1.2 Injuries to persons

Injuries	Crew	Passenger	Others
Fatal	01 (CFI)	Nil	Nil
Serious	01 (Student Pilot)	Nil	Nil
Minor/ None	Nil	Nil	Nil

1.3 Damage to Aircraft

The aircraft was destroyed due to high impact with concrete structures, trees and subsequently with ground. The details of the damages sustained by the aircraft is provided in para 1.12 of the report.

1.4 Other damage

The aircraft hit concrete terrace wall of a house and trees before impacting with concrete tower of a temple. Due to high impact, the temple tower was damaged and separated from top. The concrete terrace wall of house was also found damaged.

1.5 Personnel Information

1.5.1 Pilot -In Command (CFI)

Age	54 Years
Date of Joining company	25.09.2016
License	CPL
Date of Issue	27.07.1994
Valid up to	07.03.2024
Category	AEROPLANE
Class	S.E. & M.E.
Date of Class I Med. Exam.	03.08.2022
Class I Medical Valid up to	06.02.2023
Date of issue FRTOL License	27.07.1994
FRTOL License Valid up to	07.03.2024
Aircraft Endorsements as PIC	PUSHPAK MK-1, C-152, C-172 & PA34
Total flying experience	7177:05 Hrs APPROX
Total flying experience on type (Cessna 152)	More than 2000:00 HRS
Last Flown on type (Cessna 152)	05.01.2023
Total flying experience during last 1 year	644:20 Hrs
Total flying experience during last 6 Months	300:25 Hrs
Total flying experience during last 90 Days	124:55 Hrs
Total flying experience during last 30 days	50:05 Hrs

Total flying experience during last 07 Days	05:05 Hrs
Total flying experience during last 24 Hours	03:00 Hrs
Rest period before flight (Night Flying)	01:00 Hrs
Whether involved in any Accident/Incident earlier	YES
Date of latest Flight Checks and Ground Classes	21.08.2021 (STANDARDIZATION CHECK WITH DGCA FOI) & 03.09.2022 (IR TEST WITH DGCA FOI) 03.07.2022 (GROUND REFRESHER)

1.5.2 Student Pilot

Age	23 Years
License	SPL
Date of Issue	01/01/2020
Valid up to	31/12/2024
Category	Aeroplane
Class	Single engine land
Date of Med. Exam.	16/08/2022
Medical Valid up to	24/08/2023
Date of issue FRTOL License	02/03/2020
FRTOL License Valid up to	01/03/2023
Aircraft Endorsements as PIC	NA
Total flying experience	184 Hrs
Total flying experience on type (Cessna 152)	184 Hrs
Last Flown on type (Cessna 152)	05/01/2023
Total flying experience during last 1 year	134 Hrs
Total flying experience during last 6 Months	84 Hrs
Total flying experience during last 90 Days	22.55 Hrs
Total flying experience during last 30 days	17.50 Hrs
Total flying experience during last 07 Days	03.10 Hrs
Total flying experience during last 24 Hours	Nil
Rest period before flight	4 Days

Both Instructor and Student Pilot had adequate rest prior to operating the flight.

1.6 Aircraft Information

1.6.1 Cessna 152 General Information

Cessna 152 aircraft is an all-metal; high-wing equipped with fixed tricycle landing gear and designed for general aviation utility purposes. Aircraft is powered with one four-cylinder Avco Lycoming, O-235-L2C engine. The engine provides rated power of 110 BHP with 2550 RPM engine using 100 LL (low lead) fuel. The aircraft is fitted with fixed pitch Propeller of model No.1A103/TCM6958 with 2 blades. The aircraft is fitted with Long Range Tanks having a total Fueling capacity of 39 U. S. Gallon and usable fuel is 37.5 U. S. Gallon. (1 U. S. gallon = 3.78541Liters).

The construction of the fuselage is a conventional formed sheet metal bulkhead, stringer, and skin design referred to as semi monocoque. Major items of structure are the front and rear carry-through spars to which the wings are attached, a bulkhead and forgings for main landing gear attachment at the base of the rear door posts, and a bulkhead with attaching plates at the base of the forward door posts for the lower attachment of the wing struts. The externally braced wings, containing the fuel tanks, are constructed of a front and rear spar with formed sheet metal ribs, doublers, and stringers. The entire structure is covered with aluminum skin. The front spars are equipped with wing to fuselage and wing-to-strut attaches fittings. The aft spars are equipped with wing –to-fuselage attach fitting, and are partial-span spars.

The landing gear is of the tricycle type with a steerable nose wheel and two main wheels. The nose wheel is connected to the engine mount and has an oleo strut to dampen and absorb normal operating loads. The nose wheel is steerable through 8.5° either side of center. By applying either left or right brake, the degree of turn may be increased up to 300 each side of center. The braking system consists of single disc brake assemblies fitted to the main gear and operated by a hydraulic system. Brakes are operated by pushing on the top portion of the rudder pedals. When the aircraft is parked, both main wheel brakes may be set by utilizing the parking brake which is operated by a knob on the lower side of the instrument panel.

General characteristics

- Crew : one pilot
- Capacity : one passenger
- Length : 24 ft 1 inch (7.3m)
- Wingspan : 33 ft 4 inch (10.2m)
- Height : 8 ft 6 inch (2.6m)
- Wing area : 160 ft² (14.9m²)

Aircraft Performance

- Max speed at sea level : 126 mph (110 knots, 204 km/h)
- Cruise speed, 75% power at 8000 Ft : 123 mph (107 knots, 198 km/h)
- Stall speed : 48 Knots unpowered, flaps down

- Take-off roll : 725 ft (221m)
- Extended range 75% at 8000 ft : 545 Nm with long-range tanks
- Endurance 75% at 8000 ft : 5.2 Hrs.
- Service ceiling : 14,700 ft (4,480 m)
- Rate of climb : 715 ft/min (3.6 m/s)
- Max. wing loading : 10.5 lb/ft²
- Minimum power/mass : 066 hp/lb (108 W/kg)

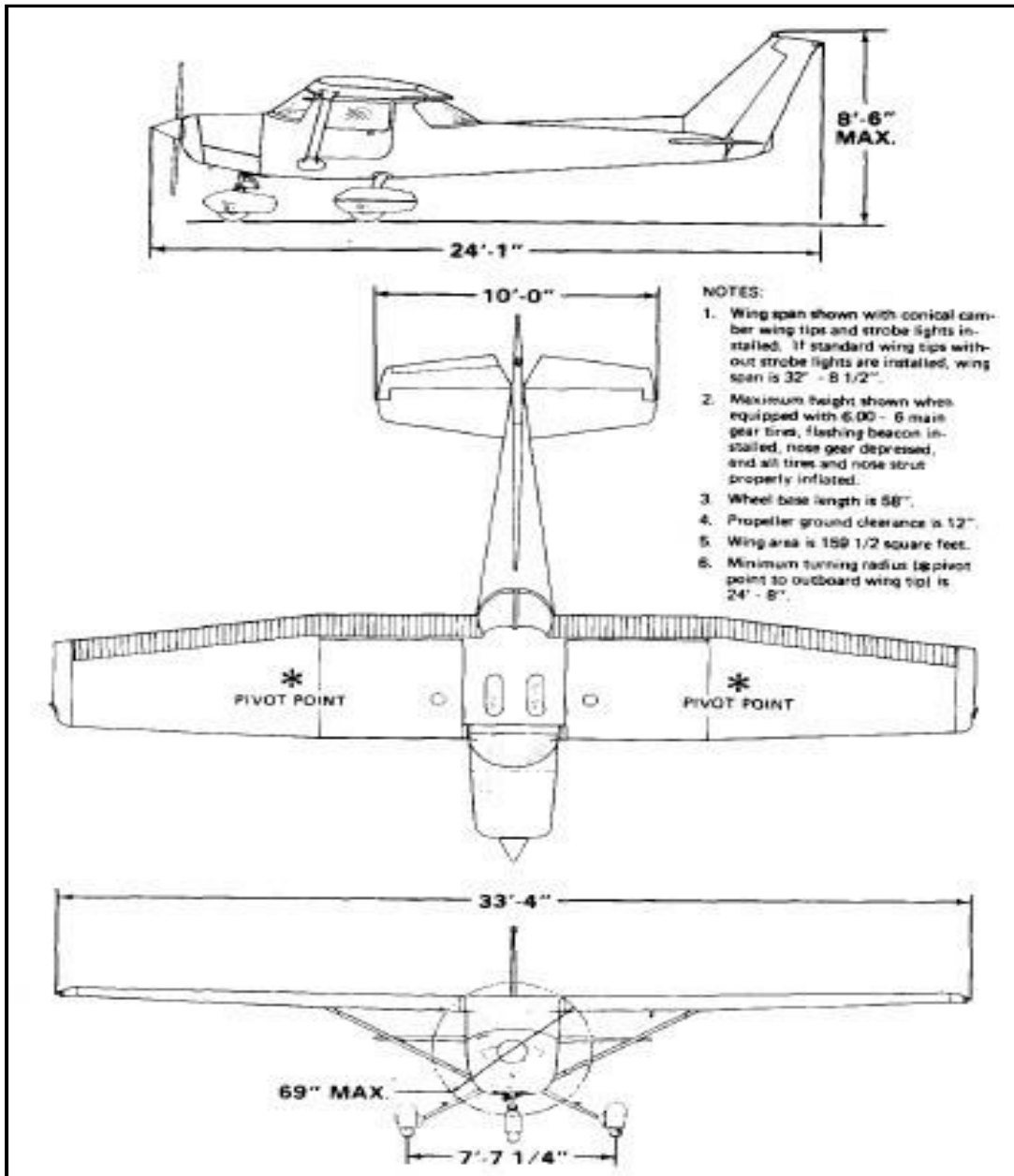


FIG.2: CESSNA 152 AIRCRAFT DIMENSIONS

1.6.2 Aircraft VT-PTE Specific Information

Aircraft Model	Cessna 152
Aircraft S. No.	15285850
Year of Manufacturer	1984

Name of Owner	Falcon Aviation Academy
C of R (No. & validity)	4211 & Valid
C of A (No. & Validity)	6320 & Valid
Category	Normal
C of A Validity	Subject to validity of ARC
ARC issued on	21.07.2022
ARC valid up to	13.07.2023
Aircraft Empty Weight	538.64 Kgs.
Maximum Take-off weight	757.49 Kgs.
Date of Aircraft weighing	03.03.2013
Max Usable Fuel	61.20 Kgs.
Max Payload with full fuel	757.49 Kgs.
Empty Weight C. G	80.04 cm aft of Datum
Next Weighing due on	N/A
Total aircraft Hours	10418:28 Hrs.
Last major inspection (on aircraft)	Operation-4-200 Hrs./12 months Inspection Schedule dated 28.12.2022
Engine Type	O-235-N2C Lyco.
Engine Sl. No.	RL-19324-15
Last major inspection (on engine)	Operation-4-200 Hrs./12 months Inspection Schedule dated 28.12.2022
Repairs carried out after last major inspection till date of accident	NIL
Total Engine Hours Since New	N/A
Total Engine Hours Since Overhaul	1342:35 Hrs. TSO
Aero mobile License	A-114/005

1.7 Meteorological Information

As on date of accident, the Rewa aerodrome was an uncontrolled aerodrome with no MET facility at airport. Hence, as a practice, to assess the current weather and forecast the instructors/students used to take weather information from other nearby stations like Varanasi, Prayagraj, Jabalpur, Khajuraho, etc. before the commencement of the flight. The weather information obtained from some of the nearby stations for 05 January 2023 is given below:

Station	Time (UTC)	Winds (°/Kts)	Visibility	Temp (°C)	QNH	Forecast
VEBN (Varanasi)	1900	290/02	1500 m	09	1024	NOSIG
	1800	290/02	1500 m	10	1024	NOSIG
	1730	VRB 01 KT	1500 m	10	1024	NOSIG
	1700	VRB 01 KT	1500 m	10	1024	NOSIG
	1630	VRB 01 KT	1500 m	10	1024	NOSIG

	1600	VRB 01 KT	1500 m	10	1024	NOSIG
VAJB (Jabalpur)	1530	050/05	1800 m (HZ)	15	1023	NOSIG
	1500	050/05	1800 m (HZ)	16	1022	NOSIG
	1430	030/06	1800 m (HZ)	16	1022	NOSIG
	1400	020/06	2000 m (HZ)	17	1022	NOSIG

As per the statement of the eyewitnesses, student pilots and instructors the visibility during the commencement of night flying at Rewa (at around 1930 Hrs IST) was around 2000 meters which was assessed based on visibility of a school tower (used as visibility marker) which is approximately at 2000 meters from airport towards runway 25 side. They further stated that the visibility kept on deteriorating and it was always below the minima required for VFR flight. However, during the accident sortie the visibility substantially dropped within few minutes and became almost zero due to sudden setting of fog/mist. To understand this phenomenon of sudden drop of visibility the investigation team visited the Rewa airfield during the night on 06 Jan 2023 and it was observed that around 2330 Hrs IST (approximately the same time that of accident) there was sudden setting of fog/mist due to which the visibility became almost zero as the ATC tower which was about 60 meters ahead was not visible while standing at the taxiway/runway intersection point.

1.8 Aids to Navigation

Rewa Airfield was not equipped with any navigational equipment. The pilot follows visual cues and ICOM GPS Device (Handset) for navigating the aircraft.

1.9 Communication

1.9.1 Communication between aircraft and ground (on RT)

Aircraft was fitted with a VHF radio set to cater for communication while flying. The communication is being done through the help of RT. The tower made for the purpose of RT communications from ground are being handled by student pilots/Instructors of the organization. According to the statement provided by the student pilot, up until the accident occurred, there had been consistent and effective two-way communication established between the tower and the aircraft, utilizing the local frequency of 123.45 MHz. As per the statement of student pilot manning the tower and the instructors who later took over the RT from the student pilot, the aircraft did not made any distress call. The last call made by the aircraft was when the CFI relayed the position of aircraft on RT "We are 0.8 NM and 200 feet" just before the accident.

Since Rewa was an uncontrolled airfield, the tower did not had a system in place for recording and subsequently retrieving the communications exchanged between the tower and the operating aircraft.

1.9.2 Communication between the Instructor and Varanasi tower on landline

Due to low visibility, the crew could not see any visual cues to locate the runway despite number of attempts for landing at Rewa. Hence, the CFI decided to divert to Varanasi.

Accordingly, CFI informed the same on RT and asked the instructor (on ground) to co-ordinate with Varanasi for their arrival. The instructor then handed the RT to another instructor and went to office premises to co-ordinate with ATC, Varanasi. Some of the salient communication between the instructor and Varanasi tower on landline is appended below:

Time (UTC)	Unit	Conversation
FIRST CONVERSATION		
17:50:42	FAA	Instructor Calls Varanasi, ATC
17:50:45 - 17:50:56	FAA	The instructor explains the situation and asks controller to co-ordinate for landing.
17:51:10 - 17:51:38	VARANASI ATC	- The controller asks to STAND BY and then confirms if the diversion is required for now. Controller further asks if they are asking for landing. - The instructor confirms the same.
17:51:39 - 17:51:51	VARANASI ATC	- The controller further asks "if this is a training flight and what are the flight rules." - The instructor confirms the same and informs that the flight rules are IFR.
17:51:54	FAA	The instructor further informs that they will be forwarding the FIC, ADC of flight plan and as it was a local flight, they are now filing the flight plan.
17:52:00 - 17:52:53	VARANASI ATC	- The controller asks to STAND BY and then informs that because it has not been updated in the system yet, they are not able to see it. The controller further asked instructor to give the contact number and they will call in 5 minutes. - The instructor accordingly gave the contact number.
17:53:05 - 17:53:22	VARANASI ATC	- The controller then asks instructor to call after 5 minutes. The controller further informs that subject to visibility and trend they can give diversion and they are co-ordinating with MET. - The instructor acknowledges the same and the call ends.
SECOND CONVERSATION		
17:55:00 - 17:55:08	VARANASI ATC	The controller confirms that the call is made to Rewa. Thereafter, the controller informs that there is a NOTAM for runway closure and asks instructor to refer it.
17:55:12 - 17:55:29	FAA	The instructor then asks controller to hold the call as it was difficult to connect the call. The instructor starts checking for NOTAM and then tells controller that it is not traceable. The instructor then asks about the time period of NOTAM.
17:55:30	VARANASI ATC	The controller asks to STAND BY
17:55:35 - 17:55:40	FAA	The instructor again requests for timing and informs that the endurance is for 03 hours 30 minutes and the aircraft has already set course.
17:55:45	VARANASI ATC	The controller then asks to HOLD.

Time (UTC)	Unit	Conversation
17:55:53	VARANASI ATC	The controller then informs the timing i.e. from 1730 to 2359 and then the NOTAM number "ALPHA TWO FOUR SIX FIVE OBLIQUE TWO TWO".
17:56:11	VARANASI ATC	The controller again informs the timing and reads the content of the NOTAM "RUNWAY 09-27 CLOSED DUE RESA AND TAXIWAY BRAVO FILLET WORK IN PROGRESS FOR URGENT REQUIREMENT 45 MINUTES PRIOR FOR AVAILABLE OF RUNWAY". The controller then asks to read the NOTAM and take actions accordingly.
17:56:27	FAA	The instructor acknowledges the same and asks if both the runways are closed from 1730 to 2359 UTC. The controller affirms the same.
17:56:33 - 17:56:40	VARANASI ATC	The controller again asks instructor to refer the NOTAM and inform accordingly. The instructor acknowledges the same and the call ends.
THIRD CONVERSATION		
18:06:38 - 18:06:43	VARANASI ATC	The controller calls the instructor and asks about the intentions.
18:06:45	FAA	The instructor informed that they checked the NOTAM for runway closure and that they are trying at REWA only.
18:06:55	VARANASI ATC	The controller then replied "Ok, you said that time it has already set course, that is why I called to know where it has set course?"
18:07:01	FAA	The instructor then informs that "It had already set course and was actually holding between 10 to 15 miles waiting for your final confirmation.
18:07:08	VARANASI ATC	The controller replies "OK, actually there was a NOTAM, so we asked you to check it."
18:07:15	FAA - VARANASI ATC	<ul style="list-style-type: none"> - The instructor informs that they could trace the NOTAM and it is valid till 11th Jan. - The controller affirms the same and asks to inform if there will be any requirement. - The instructor acknowledges the same and said will inform, if it lands.
18:07:27	VARANASI ATC	The controller asks to inform prior because of ongoing civil work and they require time to make the runway ready.
18:07:35 - 18:07:37	FAA - VARANASI ATC	<ul style="list-style-type: none"> - The instructor asks "As of now the runway is closed only?" - The controller responds "Yes, the runway is closed not available but just in case as you said that it has set course that's why I called you back."
18:07:45	FAA	The instructor again asks "If they try now, is it possible?"

Time (UTC)	Unit	Conversation
18:07:48	VARANASI ATC	The controller replied that "Yes, on emergency basis; you must have seen the NOTAM its written on prior notice...runway work is going on here and it will take that much time to clear the runway"
18:08:01 - 18:08:07	FAA - VARANASI ATC	- The instructor asks "How much time?" - The controller responds that "Whatever is written in the NOTAM will be followed. You please check the NOTAM and then let us know"
18:08:14	FAA	The instructor said "The NOTAM is in front only and in the last line it is written Papa November for available of runway...only this much is written" The instructor then reads "OK! requirement of 45 minutes prior for available....."
18:08:22	VARANASI ATC	The controller in reply said "It is mentioned 45 minutes, so you refer that and let us know. But, as of now you are trying at your place, right?"
18:08:29 - 18:08:33	FAA	The instructor informs "Yes, we are trying here only and if there is something, we will let you know" The controller acknowledges "OK OK" and the call ends.
FOURTH CONVERSATION		
18:45:13 - 18:45:27	VARANASI ATC - FAA	The controller calls FAA and asks "Are you from Rewa, Falcon Aviation Academy? I am calling from Varanasi. We received phone call from Kolkata stating that they have received call from Mumbai FIC regarding receipt of ELT signal of VT-PTE." The instructor responds "I confirm mam! We have just reached. The aircraft has crash landed."
18:45:36 - 18:45:40	VARANASI ATC - FAA	- The controller confirms again "Aircraft has crash landed?" - The instructor confirms "Yes mam"
18:45:41	FAA	The instructor further conveys "Mam, we were about to call you! Just wanted to confirm after finding the aircraft visually."
18:45:46 - 18:46:03	VARANASI ATC - FAA	- The controller asks "Are you at the site or going there?" - The instructor replied "Madam! we reached the site and now left the site. Both of them have survived as of now. We are taking them to hospital" - The controller confirms again "Crew have survived, you are taking them to hospital and aircraft has crash landed?" - The instructor confirms the same "I Confirm" and the call ends.

1.10 Aerodrome Information.

As on date of accident, the Rewa Airstrip, Chorhata, was an uncontrolled airfield. The airstrip was owned by Government of Madhya Pradesh, India. The airstrip is located at about 18 km

distance from Rewa city. The airstrip had one runway with orientation of 07/25 and Asphalt surface. As on date of accident, following are some salient information about Rewa Airstrip.

ARP	24° 30' 12"N 081° 13' 13"E
RW Orientation	07 / 25
Airstrip	Length- 1829m Width- 29m
ATC Frequency	Listening watch on 123.45 MHz
Elevation	997 ft
Traffic Pattern Altitude	2000 ft (1000 ft AGL)
Runway 07	Right Hand Pattern
Runway 25	Left Hand Pattern

This airstrip had no ICAO code. The airport had no ATC facility, however, there was a tower made for communicating with operating aircraft with RT. The airstrip was primarily used for flying training purpose by Falcon Aviation Academy. The local airport ID (FAA LID) of this airstrip is VA1G. The airstrip IATA code is REW. This airstrip is in the Mumbai FIR. The local RT facility with the frequency of 123.45 MHz was available with this airstrip and the facility was controlled by Falcon Aviation Academy. The signal square area consists of a landing "T" illuminated along with aerodrome beacon light at night. Temporary electrically operated lamps were used as runway edge lights for night operations.

1.11 Flight Recorders

The aircraft was not equipped with any flight recorder (CVR/DFDR). DGCA's Civil Aviation Regulations does not mandate the same as per CAR Section 2 Series I Part V.

1.12 Wreckage and Impact Information

The crew were not able to find any visual cues from ground and in search of the same the crew kept on descending the aircraft. During this process the aircraft hit one of the trees before its landing gear hit the terrace of a house, which was about 15 feet above the ground as evident from the rubbing marks of landing gear tyre on the wall and damages at the same position on the concrete structure. Simultaneously, the left wing hit one of the trees adjacent to the house where there were signs of fuel spillage. Thereafter, the aircraft penetrated through another tree in front of the house, breaking its trunk. The right-side wing of the aircraft then struck a concrete temple tower. Due to the heavy impact the top portion of the temple tower broke and got separated from the structure. The right wing was also found separated from the aircraft structure. Subsequently, the aircraft impacted the ground before coming to the final rest position just in front of a house. The location of the aircraft where it crashed was at a distance of approximately 0.86 Nm from end of runway 25.



FIG 3: LOCATION OF ACCIDENT SITE FROM REWA AIRFIELD.



FIG 4: PICTORIAL REPRESENTATION OF VT-PTE FINAL PATH, IMPACT AND FINAL POSITION.

The aircraft was subjected to extensive compression damage to the forward fuselage, after heavy impact with trees, concrete structure, and ground. Some of the major damages sustained by the aircraft are appended below: -

- Both wings were found fully detached from the aircraft structure.
- The aircraft empennage was found separated from the Aircraft.
- The left horizontal stabilizer was observed with the banner tow cables and some tree remains wrapped around the edges of the wing.
- Flight control cables were found broken.
- Examination of the cockpit revealed the instrument panel was damaged due to impact.
- Visual examination of engine revealed following: -
 - The engine was found attached to the structure.

- The propeller was found detached from engine and stuck on ground with one blade penetrated 8-12 inch deep into the ground. The blades were found bent from the tip.
- The propeller spinner was not fragmented.
- In the cockpit, the throttle control knob and mixture control knob were in aft position. The carburetor heat control knob was in forward position.

Some of the wreckage photographs are provided at 'Appendix A' of the report.

1.13 Medical and Pathological Information

The CFI had undergone pre-flight BA test in the morning before operating the first flight of the day. The student pilot did pre-flight BA test in the morning. The test result was negative for both.

The CFI was fatally injured during the accident and as per the post mortem report the cause of death was given as instantaneous death due to multiple injuries to the body. The injury was caused due to impact against hard and blunt object.

1.14 Fire

There was no pre or post impact fire.

1.15 Survival Aspects

The aircraft crashed in front of a house (water supply plant) in Umri village at late night. Immediately after the crash the villagers came out of their houses and came to rescue the student pilot and CFI from the aircraft wreckage. As per the statement of the villagers both CFI and student pilot were found inside the cockpit with their seat belts locked. The villagers rescued the CFI and student pilot from the aircraft wreckage. The CFI was not responding and was unconscious. The student pilot received serious injuries and was bleeding.

The instructor who was communicating with the aircraft on RT tried to establish contact with the aircraft but there was no response. Hence, one of the instructors tried to establish contact on student pilot's mobile phone. The call was picked up by a villager and they informed that the aircraft had crashed in the Umri village near Water supply plant. The instructors and student pilot then immediately rushed to the accident site and observed that CFI and student pilot were already taken out from the aircraft wreckage by the villagers. They were immediately taken to the nearby hospital in Rewa for treatment. The CFI was declared brought dead. The student pilot however, survived with serious injuries. The ELT activated immediately after the accident and the digital message was received by the Mumbai tower and the Rescue Coordination Centre at 18:24 hrs UTC.

1.16 Tests and Research

Nil

1.17 Organizational and Management Information

1.17.1 Falcon Aviation Academy

Falcon Aviation Academy (FAA) was established in 2006 to provide integrated Flying and Ground Training to achieve Student Pilot's License (Aeroplane) SPL (A), Private Pilot's License

(Aeroplane) PPL (A), Commercial Pilot's License (Aeroplane) CPL (A), Instrument Rating (IR), Multi Engine Rating (ME Rating), Assistant Flight Instructor's (Aeroplane) AFIR (A) and Flight Instructor's Rating (Aeroplane) FIR (A). As per the TPM of the organisation, training will ab-initio be provided at Faizabad Airfield, Ayodhya (U.P.) as per the Agreement between Falcon Aviation Academy and the Government of Uttar Pradesh, whereby the airfield has been leased to Falcon till 2039. Satellite bases for ab-initio training will be operated from Rewa airstrip, Rewa (M.P.). However, as on date of accident, the operator had shifted their base to Rewa and all the flying training activities of the organisation were carried out at Rewa.

The organization provides flying training on both single engine and twin-engine aircraft. FAA has acquired Ten Cessna 152 single engine aircraft and Two Piper Seneca PA-34 multi-engine aircraft for flying training purposes. All these 12 aircraft have been issued Certificate of Airworthiness (C of A). FAA also provides training on Redbird MCX Motion Simulator. FAA has an approved Part-145 Maintenance Organization status from DGCA for maintenance of all types of aircraft on the inventory of the Academy vide DGCA approval no. FAA/F-App/813 dated 09.08.2012.

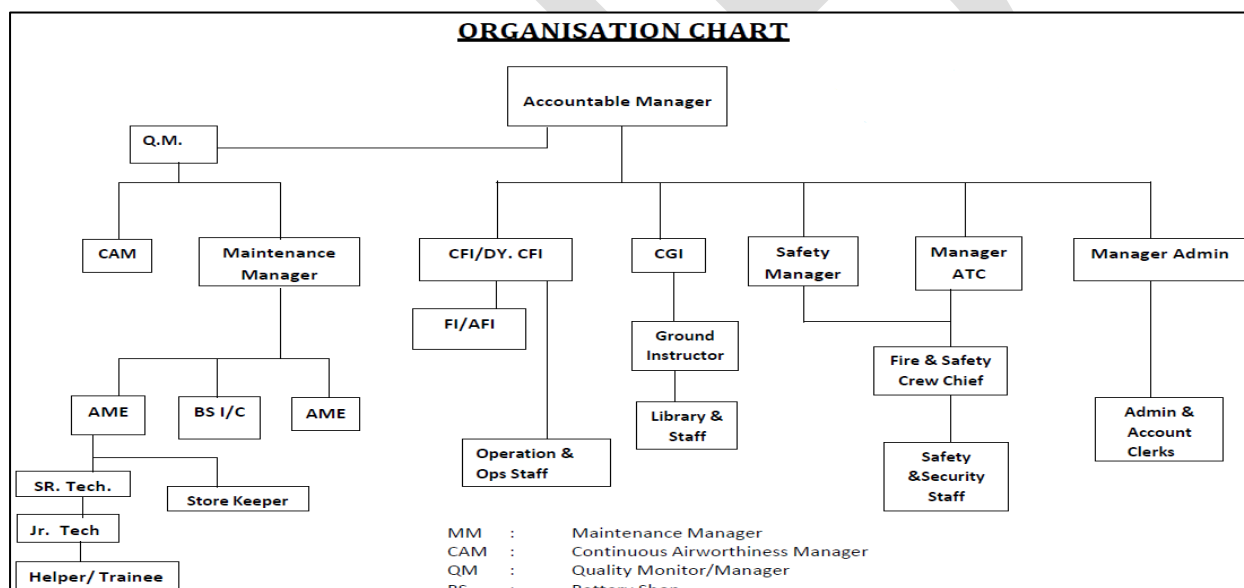


FIG 5: ORGANIZATION CHART OF FAA

1.17.2 Training and Procedures Manual

The Company's Training and Procedure Manual Issue 01 Rev 00 was initially issued on 15 Feb 2016 after approval of DGCA. The TPM was then revised to incorporate the existing CAR & other regulations and submitted to DGCA for approval. DGCA vide e-mail dated 06 May 2021 conveyed the acceptance of the revised TPM to FAA.

1.17.2.1 Duties & Responsibilities of CFI

As per TPM following Duties & Responsibilities has been assigned to CFI:

The CFI will be the overall in charge of operational department and will be responsible for all flying/operational activities. He will report to the Accountable Manager (AM).

- The CFI is responsible for imparting quality and standardized flying training in accordance with the DGCA prescribed syllabus and ensure the training standards meets the requirements of the industry.
- The CFI shall ensure that the Flying Training Manual is prepared in accordance with the regulatory requirements and covers all the aspects of flying training.
- CFI is responsible for:
 - i. Operational Control, conformance to Policies and Standards.
 - ii. Training of FI, AFI and students.
 - iii. Maintenance of operational records/documents.
 - iv. Amendment of TPM and issue of circulars or standing orders when necessary.
 - v. Assimilation, evaluation and follow up action on operational reports.
 - vi. Ensure all safety requirements are observed.
 - vii. Ensure that crew is trained and qualified according to DGCA licensing requirements.
- Functions of the CFI:
 - i. To carry out patten training for the issue of AFIR (A)/FIR (A).
 - ii. To conduct student pilot's license examination and Flight Radio Telephone Operators (Restricted) Examination as per DGCA guidelines.
 - iii. To issue SPL (A) as per DGCA guidelines.
 - iv. To impart flying training to trainee pilots for the issue of Civil Flying Licenses and carry out their periodical progress checks.
 - v. To authorize and supervise flights of the aircraft operated by the FTO for which it is approved.
 - vi. To act as overall in-charge of the flying training activities of Falcon Aviation Academy.
 - vii. To authenticate the entries in the pilot's log book.
 - viii. To conduct standardization/periodic checks of the AFIs/FIs.
 - ix. To ensure overall discipline and orderly conduct of the student pilots in the academy.
 - x. All other functions and requirements as per CARs.

1.17.2.2 Procedure to obtain Weather Information

Following procedures have been mentioned in the TPM of the organisation for obtaining weather information: -

- Obtaining relevant weather information is essential to flight safety and is a mandatory requirement.
- The procedure to obtain weather information is as follows:
 - For obtaining METAR and TAFOR: -
 - Open www.imd.gov.in from the default internet browser on the Operation's Computer.
 - Note down the available METAR and TAFOR information.
 - For obtaining METAR and Weather Forecast: -
 - Open "imd.gov.in/pages/airportmetars.php" on the default internet browser on the Operation's Computer.
 - Read METAR of all required/ desired Station.

- MET Register

Post obtaining all the relevant weather information from the aforementioned procedure, the operations officer must ensure the met register is timely updated within the respective columns provided.

The organisation had a dedicated staff for updating weather information on the MET register. The staff updates weather on MET register after obtaining them online through various websites including IMD. Apart from this as a practice the instructors/students also obtain MET information themselves through online by referring to these websites.

On the day of accident, the night flying training started at about 1930 hrs IST, however, the MET register was updated till 1800 Hrs IST only.

There is no laid down SOP for analysing the local weather before operating the flight. As per the statement of Instructors and student pilots of the organisation as a practice the organisation obtains the weather and trends through online for nearby stations like Varanasi, Prayagraj, Khajuraho, etc. They then analyse this MET information obtained from nearby stations and conduct the training flights accordingly. However, this practice is not laid down in their TPM or any other document. There is no visibility chart maintained by the organisation, however, on enquiring it was informed by the instructors & students that there is a school tower towards the runway 25 side which is used as a visibility marker to analyse the existing local visibility conditions for operating day flights. However, the school tower was at a distance of about 2000 meters from the airstrip. Other than that, there was no visibility marker identified for flying operations. There was no specific visibility marker identified to analyse the visibility conditions for night flying.

1.17.2.3 Weather Minima

The weather minima procedures as defined in the TPM is given below: -

- Instructors

All dual flights are governed by the weather minima specified in DGCA regulations. VFR flight training is carried out when visibility is 5km or above the weather minima. An AFI/Fl may operate with special VFR subject to authorisation from CFI/Dy CFI.

- Students

Students in FAA follow the VFR rules for solo flying training.

On the day of accident, the visibility conditions at night were well below the minima required for VFR flights. Initially, on the day of accident the night flying training was planned on 03 aircraft by CFI, Dy.CFI and a Fl. However, after lot of deliberations regarding the DGCA regulations for carrying out night flying exercise under such low visibility conditions, CFI decided to fly only one aircraft that time. The CFI decided to carry out night flying exercise himself and the other two instructors cancelled their respective night training flights. The night flying

training exercise on the day of accident was carried out in conditions below the weather minima required for VFR flight.

There is no existing DGCA regulation which allows flying training activities below VFR conditions.

1.17.3 SOP for co-ordination between FAA and ATC, Varanasi (VEBN)

An SOP was formulated for co-ordination between the organisation and ATC, Varanasi. The SOP was initially executed on 12.08.2019 which was later revised on 05.06.2020. The SOP has been formed for flying training exercises to be carried out from Rewa airfield. In the said SOP, it is mentioned that these SOPs has been compiled for smooth and efficient flying operations, ensuring comprehensive air safety and for seamless coordination with ATC, Varanasi.

Following are the salient procedures mentioned in the SOP: -

- Prior information regarding the roster of all flying training activities within 10 nm upto 4000' AGL of Rewa ARP (designated as 'Local Flights') and cross-country flights will be emailed to Varanasi ATC along with CC to Prayagraj and Khajuraho ATCs one day in advance. Necessary coordination will be effected over telephone. Filing of flight plan would be ensured as per AAI letter AAI/ATM/OPS/19-36/2019 para 5 dated 05th August 2019.
- Training flights towards Varanasi ACC jurisdiction shall follow the ATS routes on altitudes specified for their route and contact Varanasi ATC shall contact on 118.95/128.15/123.875/118.1 MHz or Varanasi Radar on 118.95/ 128.15/ 123.875 MHz prior to entering the CTR/restricted airspace. FTC, ADC, squawk code & clearances would be informed by operator. Flight plans shall be filed online by operator. Operator/PIC shall take positive clearance from Varanasi Area. PIC/Operator shall ensure valid ADC and FIC no. before obtaining ATC clearance from Varanasi ACC. Fax number of Varanasi ARO is and email id:
- Satna Airport (Radial 280/20 Nm from Rewa airfield), would be taken as an alternate aerodrome.
- 'Night Flying' approval at Rewa airfield has been granted by DGCA vide its Certificate of Approval (DFT File No..... dated 20.11.2019). Falcon Aviation Academy's Training and Procedure Manual (TPM) has been amended on 25.11.2019 for using Rewa airfield for 'night flying'.

Although the procedure for providing information regarding the roster of flying training activities at Rewa to Varanasi ATC & other nearby stations existed in the SOP but the same was not being done by the organisation. During interaction with the instructors of the organisation it was informed that as a practice they inform Prayagraj before operating night flying exercise at Rewa. As a practice in the organisation the instructors on a common whatsapp group used to provide details (a kind of checklist) about the sortie before and after the flight. Accordingly, before operating the night flying exercise the CFI on whatsapp group at 1904 IST provided information (as one of the points of checklist) that the Prayagraj has been informed.

The SOP states that night flying approval at Rewa has been granted by DGCA vide its Certificate of Approval. However, there was no mention of 'Night flying' in the Certificate of Approval given

by DGCA. It was mentioned in the Certificate of Approval that the operations will be conducted in accordance with the appropriate TPM. Hence, the night flying exercise at Rewa is being carried out as per the DGCA approved TPM. The TPM of the organisation had following information regarding night flying: -

“Adequate lightning is available for night flying operations; runway, taxiway lightning is done with the help of goose neck lamps as per the night flying approval of the academy. Aerodrome beacon as per the rules and anti collision light on ATC is available and sufficient light is available for ground signal area with wind sock.”

Other than this, there was no separate SOP given in TPM regarding night flying training exercise. However, the organisation had a separate night flying SOP for Faizabad Airfield (Earlier base of the organisation) approved by DGCA dated 31.12.2014 wherein detailed procedures/requirements were given for carrying out night flying activities.

1.17.4 ATM-NOC for flying training activity at Rewa Airfield, Madhya Pradesh

The organisation obtained an NOC from AAI for carrying out flying training activity at Rewa airfield. AAI gave the NOC vide their letter dated 05 August 2019 with some conditions. Some of the conditions are appended below: -

1. This NOC is from ATM operational point of view only and valid for a period of one year from its date of issue.
2.
3. All local flying activities shall be carried out under Visual Flight Rules (VFR) i.e. restricted from sunrise from sunrise to sunset and in accordance with the conditions of SOP mentioned in SI no 8.
4.
5. The mandatory requirements regarding flight planning and obtaining ADC FIC of the flights shall be in accordance with the provisions contained in e-AIP India.
6. All operational requirements as given in Aircraft Rules 1937 and other applicable regulatory conditions shall be fulfilled before commencement of the proposed activities. The activities shall be in compliance with relevant DGCA CAR/ instructions issue from time to time.
7. The applicant shall communicate the proposed date of start of flying activities at Rewa Airfield at least two months before the initial commencement of flying activities to AAI CHQ along with a copy of DGCA's approval.
8. The operations may be approved only after establishing a Standard Operating Procedure (SOP) with Varanasi ATC clearly mentioning the procedures to be followed for Flying Club operations. The SOP shall also contain the DGCA approval. The operations may be notified through a NOTAM which shall include the DGCA approval number and contact points. The SOP shall be endorsed by GM (ATM) Eastern Region AAI and Flying Club In-charge Falcon Aviation Academy responsible for operations.
9. Start and End of operations shall be informed to appropriate AAI ATS unit on all days of activity as per SOP.

10. The conduct of training flights from Rewa shall be subject to compliance to all the regulatory provisions and final approval from the DGCA.

The NOC was initially valid for 01 year only i.e. till August 2020. Later, an addendum was issued dated 23.06.2020 wherein para 3 of the NOC was amended as

“All flying activities shall be carried out in accordance with the DGCA Certificate of Approval (DFT File No.....dated 20.11.2019) and the conditions of SOP mentioned in Sl.No.8.”

The NOC was also extended upto 19.12.2020. The NOC validity was further extended from 20.12.2020 to 19.12.2022 vide AAI letter dated 05.01.2021. Hence, the ATM-NOC was not valid as on date of the accident.

1.17.5 DGCA Regulations & Advisories on Flying Training Activities

1.17.5.1 DGCA Flying Training Circular 01 of 2022

DGCA had issued a flying training circular 01 of 2022 dated 22 November 2022 regarding “Monitoring of training in Flying Training Organization” with the objective to enhance DGCA oversight over flying training and ground training activities of Flying Training Organization for improving the safety of operations and quality of training. It is also mentioned that this would also facilitate instructors in analyzing the performance of the trainee pilots and investigations by DGCA.

The circular covers following aspects for monitoring of flying training:

- **Installation of Camera**
- **Flight data monitoring in aircraft**

A timeline of 90 days from the date of issue of the circular was given to the organizations having a fleet not pre-equipped with glass cockpit. The organisation was mostly operating Cessna 152 aircraft which was not equipped with glass cockpit, hence, as on date of accident the FTO was in the process of making necessary arrangements to comply with the requirements mentioned in the circular.

1.17.5.2 DGCA CAR Section 9, Series C, Part 1 Para 4

Para 4 of CAR Section 9, Series C, Part 1 gives requirement for “Visual Flight Rules”. Following are the salient requirements given in the CAR: -

- Except when a clearance is obtained from an air traffic control unit, VFR flights shall not take off or land at an aerodrome within a control zone or enter the aerodrome traffic zone or traffic pattern when
 - (i) the cloud ceiling is less than 450 M (1500 ft.) or
 - (ii) the ground visibility is less than 5 KM
- VFR flights shall be operated during the period from 20 minutes before sunrise to 20 minutes after sunset.

However, local flights & training flights are allowed to operate during night under VFR as per Note 3 of Para 2.2.1 of the CAR which states that

“Local flights as may be exempted by Air Traffic Control and such training flights of Flying Club aircraft as may be cleared by Air Traffic Control may be operated during night in Visual Meteorological Conditions.”

1.17.5.3 Flying Grants Advisory Circular 02 of 2005

DGCA had issued a Flying Grants Advisory Circular 02 of 2005 for “Flying under Special VFR by Flying Clubs/Training Institutes when Visibility is less than 5 Km”. The circular stipulates that:

Keeping in view the flying training operations carried out by Flying Clubs/Training Institutes approved by DGCA, it has been decided that when the visibility is less than 5 Km, the following criteria shall be followed for conducting flying training operations by Flying Clubs/Training institutes at controlled / uncontrolled air fields in co-ordination with ATC authorities available at the Airports where the Flying clubs/Training Institute is situated:

- (a) One Aircraft When visibility is not less than 1.5 Km. with a Qualified Flight instructor/Assistant Flight Instructor on board holding valid Instrument Rating.
- (b) Two Aircraft When visibility is not less than 3.5 Km. only one solo aircraft in circuit may be authorised by CFI/FII only and the other aircraft shall be flown with a QFI /AFI holding valid Instrument Rating.
- (c) All Aircraft When the visibility is 5 Km or more for all Dual / Solo flying.

The circular also mentions that the above criteria shall be applicable for all Day Flying training operations conducted by Flying clubs/Training Institutes at the discretion of CFI/FII who should be physically present during all such flying operations.

The investigation team tried to gather more information regarding validity of the circular as it was not available on the DGCA website. It was found that the circular was part of TPMs of many FTOs which were approved by DGCA.

AAIB in one of its earlier accident investigations that occurred in 2017, issued a safety recommendation regarding the said circular. In response to the same, DGCA communicated to AAIB that the said circular was not valid and has been cancelled. However, the references of the said circular have continued to remain in the TPMs of many FTOs which were approved by DGCA. Although the said circular was not part of the DGCA Approved TPM of the organisation (FAA), however, the term like “Special VFR” was mentioned in TPM. The CFI and other instructors during discussion to undertake night flying on the day of accident probably took reference of the Flying Grants Circular 02/2005 and accordingly decided to operate only one aircraft at that time. There was no clarity regarding validity of the said circular. AAIB also sought clarification from DGCA regarding validity of Flying Grants Circular 02 of 2005.

Later, after the accident, DGCA gave a clarification through a public notice dated 22.05.2023 published on its website which mentioned that *“The Flying Training /Flying Grant/Glider Training Circulars issued by DGCA or any other circular pertaining to flying training/glider training, which are not available on DGCA website stand cancelled with immediate effect.”*

DGCA also sent an e-mail dated 23.08.2023 in this regard to all FTOs specifically mentioning the flying grants circular 02 of 2005 stating that *“Flying Grants Circular no. 2/2005 dated 12.04.2005 on subject “Flying under special VFR by Flying Club/ Training Institutes when visibility is less than 5 Km” has been cancelled through a Public notice dated 22.05.2023 on subject “Clarification regarding Flying Training Circulars and Flying Grant Circulars pertaining to flying training/glider training which are not available on DGCA website”.*

Therefore, all FTOs are advised to amend their TPM as per ENR 1.2 (Visual Flight Rules) of eAIP India.”

1.17.5.4 DGCA advisory for flying operations in Fog season

On 05.01.2023 i.e. on the day of accident (in the afternoon before the accident) DGCA issued an advisory through e-mail to all FTOs regarding “Precaution & Preparedness during fog season Jan & Feb 2023”. In the said e-mail precautionary measures to be taken by FTOs before operating the training flights during fog season were mentioned. Some of them are appended below: -

- Do not operate below visibility minima specific to your sortie profile, strictly adhere to the rules and regulations.
- Monitor the weather and visibility at your base and airports around your base.
- Monitor the trend of weather at your base and airports around your base, especially when a cross country is planned.
- Fuel planning for alternate airport in case of diversion is necessary.

1.17.6 Manual of Air Traffic Services, Part I (MATS -I)

MATS-I gives standardize procedures for air navigation/air traffic services which is uniformly applied throughout India.

Para 3.15.5 of MATS – I mentions procedures for Extension of ATC Watch Beyond Notified Watch Hours. Salient procedure is mentioned below: -

3.15.5.1 Watch hours may be extended beyond notified watch hours:

- To meet exigencies and natural calamities like floods etc. for the purpose of rescue/flood dropping missions.
- To cater for delays to scheduled and duly authorized non-scheduled services, VVIP flights.
- To cater to flights under-taken by Chief Minister/ Governor of the state and military flights on emergency mission.
- To cover the flight of an aircraft in emergency.
- When directed by the concerned GM (ATM)-Region/APD/WSO of the ACC/flight information center of the region.

The runway at Varanasi Airport was not available for operations from 1730 UTC to 2359 UTC on 05.01.2023. A NOTAM in this regard was issued which stated that “RWY 09/27 closed due to RESA and Taxiway B fillet work in progress. For urgent requirements 45 minutes prior notice for available of runway”.

When the aircraft was not able to land at Rewa due to dense fog and the CFI decided to divert the aircraft to Varanasi, the instructor (on ground) called ATC Varanasi and informed about the existing situation and requested for accommodating the aircraft for landing at Varanasi as the aircraft had already set course to Varanasi. The ATCO informed instructor about the NOTAM and asked to refer the NOTAM and call back accordingly. The instructor called ATC Varanasi again and enquired about the NOTAM as they were not aware of the same and was not able to trace it online. The controller gave full details about the NOTAM and again asked to refer it and revert accordingly. However, the instructor conveyed the message through RT to CFI that the Varanasi is closed and it is not available for landing.

1.18 Additional Information

Nil

1.19 Useful or effective Investigation Techniques

Nil

2. ANALYSIS

2.1 Serviceability of Aircraft

The aircraft had a valid C of A and ARC as on date of accident. Scrutiny of Log books revealed that as on 05 Jan 2023, the aircraft had completed 10418 hrs and its engine had completed 1342:35 hrs since overhaul. The last major inspection of 200 hrs/ 12 months inspection was carried out on 28.12.2022 at 10394:58 aircraft Hrs. Thereafter, aircraft had flown 29:03 hrs, before it met with an accident. However, all lower inspections (Pre-flight checks, Service Checks, Weekly Checks) were carried out as and when due.

Scrutiny of the aircraft records revealed that ADs, SBs and all mandatory modifications were complied with at the time of accident. Further, scrutiny of snag register revealed that there was no pending snag reported on the aircraft prior to the accident flight and it was not operating under any MEL.

No abnormality was reported in the aircraft before operating the flight. As per the student pilot they did not observe any abnormality in the aircraft during the entire flight.

From the above, it is concluded that serviceability of the aircraft was not a contributory factor to the accident.

2.2 Weather

There was no MET facility available at Rewa. However, the Metrological report issued by IMD for nearby stations to Rewa i.e. for Varanasi and Jabalpur airport at around 1345 UTC (1915 IST) on 05 January 2023 showed visibility of about 2000 meters with haze. During this time of

the year i.e. in the month of January in North/North-west part of India there is always setting of fog due to which in general the visibility remains substantially lower than the minima required for VFR flight.

As per the statement of the eyewitnesses, student pilots and instructors the visibility during the commencement of night flying activity at Rewa (at around 1930 Hrs IST) was around 2000 meters which was assessed based on visibility of a school tower (used as visibility marker) which is approximately at 2000 meters from airport towards runway 25 side. They further stated that the visibility kept on deteriorating and it was always below the minima required for VFR flight. The visibility at Varanasi at around 1800 UTC (2330 IST) i.e. 15 minutes before the accident was reported to be 1500 meters. However, during the accident sortie the visibility substantially dropped within few minutes and became almost zero due to sudden setting of fog/mist. The same was also verified during the visit of the investigation team a day after the accident wherein it was observed that around 2330 Hrs IST (accident occurred around this time on 05 Jan 2023) there was sudden setting of dense fog due to which there was substantial drop in visibility. This was confirmed as the ATC tower which was about 60 meters ahead was not visible while standing at taxiway/runway intersection point at Rewa.

From the above it is evident that the visibility at the start of night flying was about 2000 meters and deteriorated further when the night flying activities were in progress. Hence, throughout the night flying exercises the visibility was well below the minima required for VFR flights and it kept on deteriorating with time. During the accident flight it became almost zero within few minutes due to sudden setting of dense fog. Hence, the weather was a contributory factor to the accident.

2.3 Crew Aspect

2.3.1 Crew Flying Experience and Qualification

The CFI had a valid instructor rating as on date of accident. CFI's license was valid and all the training/medical examinations required for operating the flight were valid as on date of accident. The CFI was a CPL holder qualified on type and had a total flying experience of about 7177 hours including about 2000 hours on type. The CFI was qualified to operate the flight and to impart training to the student pilot. The CFI was quite familiar with the topography of the Rewa airfield and its surroundings.

The trainee pilot was qualified to operate the flight. All the requirements including medical, licenses were current as on date of accident for conduct of this training flight. The trainee pilot had about 184 hours of total flying experience and about 184 hours on type which indicates that all of the flying training exercise was carried out on Cessna 152 aircraft. The student pilot had undergone the required training for night flight, both in Instrument Meteorological Conditions (IMC) and Visual Meteorological Conditions (VMC), before the accident. The crew's pre-flight medical examinations were valid as per the prevailing DGCA Civil Aviation Requirement (CAR) Section 5 Series F Part IV.

2.3.2 Decision making and handling of the aircraft

2.3.2.1 Operating flying training exercise at low visibility conditions

Before operating the night flying exercise, the CFI had long discussion with the Dy.CFI and an FI who were scheduled to operate night flying training sorties on the day of accident. The discussion was regarding the existing regulations for operating the night flying exercise under the marginal visibility conditions (visibility being well below minima required for VFR flights) which existed almost throughout the day. The CFI also called someone over phone to clarify the issue. Thereafter, it was decided that only one aircraft will be operated in such visibility conditions and the CFI decided to conduct the night training flights himself and the other two instructors cancelled their night flying sortie.

This indicates that there was no clarity among the instructors regarding existing regulations i.e. they were not assured about the regulations for conducting flying training activities under such low visibility conditions. Even the visibility conditions of nearby airports were well below the minima required for VFR flights. It was evident that the prevailing visibility conditions were not conducive to operate the night flying exercise under VFR.

Further, during the night flying sortie with the involved student pilot, the CFI had supervised total of 03 landings which was sufficient as per the requirement for GFT by night, however, the CFI decided to carry out one more C/L sortie with the student pilot even in deteriorating visibility. Hence, the decision of carrying out the night flying exercise in such low visibility conditions was a major contributory factor to the accident.

The investigation team tried to analyse the probable reasons behind carrying out night flying exercise in such low visibility conditions. Following aspects were revealed: -

a. Undue self-imposed target to Complete the Flying Training Exercise

As per the flying training schedule prepared for the day of accident there were total of 28 training flights planned. However, as per the assessment of the flight instructors the visibility was not found conducive for flying training exercise during most of the day due to which the flying training could not be carried out as per schedule. Later in the afternoon, the instructors found the visibility conducive for flying training, hence, total of only 04 sorties were carried out during the day.

After lot of deliberation the CFI chose to carry out the night training flying exercise himself and decided to conduct the 03 training flights as per night flying training scheduled to be conducted by the CFI. Out of these 03 training flights, 02 flights were planned for those student pilots of the organisation (including the involved student pilot) who were only left with GFT by night to complete the 185 hrs of flying training on single engine aircraft as per the requirement. The other sortie planned was for an ex-student of the organisation (a CPL holder) for whom commitment was made to carry out the flying checks required for renewal of CPL.

b. Cancellation of earlier training flights leading to the day of accident.

It was observed that in the past few days leading to the day of accident the flying training exercises could not be carried out as per schedule due to adverse weather conditions which

persisted throughout the day. As per the information provided by the organisation following was revealed: -

S. No.	Date	Total flying planned for the day	Actual Flying carried out	Night Flying carried out
1.	30.12.2022	32:30 Hrs	22:55 Hrs	NIL
2.	31.12.2022	26:00 Hrs	19:20 Hrs	NIL
3.	01.01.2023	No flying activity was planned for the day		
4.	02.01.2023	31:00 Hrs	02:50 Hrs	NIL
5.	03.01.2023	31:30 Hrs	NIL	NIL
6.	04.01.2023	29:30 Hrs	NIL	NIL
7.	05.01.2023 (Day of accident)	29:30 Hrs	06:35 Hrs (Excluding the flying hours carried out with involved student pilot)	02:00 Hrs (Excluding the flying hours carried out with involved student pilot)

The above table indicates that the flying training activities in the last 07 days prior to the day of accident could not be carried out as per the schedule prepared for each day. The CFI and the instructors assessed the local weather conditions which they found not conducive for carrying out the flying training activities, hence, most of the flying training activities as scheduled could not be carried out. However, it was observed that no night flying training activity was carried out in the past 07 days leading to the day of accident. Hence, the CFI after lot of deliberation decided to carry out night flying activity on the day of accident and accordingly, the 02 student pilots who were only left with GFT by night to complete the 185 hrs of flying training on single engine were scheduled for the night flying exercise.

From the above, it is opined that the lack of flying training exercise including no night flying activity in the past 07 days may have prompted the CFI to carry out the night flying activities on the day of accident under such low visibility conditions. It is highly probable that the CFI imposed undue commitment upon himself to complete the flying training requirements of these students without considering the fact that the weather was not conducive to conduct flying training exercise.

2.3.2.2 The accident sortie

During the third night flying exercise (GFT by night) with the student pilot, they have already carried out three landings and completed the required flying training exercise as per requirement for GFT by night. However, the CFI felt that there is still some time and asked the student pilot to carry out one more circuit landing. Hence, after back tracking the aircraft, the CFI along with student pilot took-off for another sortie. The ATC was not appraised of the same and they informed ATC only after take-off. The CFI did not consider the deteriorating visibility as the student pilot who was manning the ATC stated that the visibility at that time was very low as during the climb when the aircraft was abeam the school at the runway 25 side the

beacon light was not visible and even when the aircraft was mid of downwind leg the aircraft lights were not visible due to fog.

When the CFI & Student pilot were not able to sight the runway due to dense fog, the CFI decided to divert to Varanasi. Thereafter, when the CFI got the information that the Varanasi runway is closed as NOTAM has been issued due to some construction work, the CFI decided to turn back to Rewa and tried to attempt landing at Rewa itself. The fog was very dense due to which they were not able to locate any visual cues to assess their location. Even though the aircraft had adequate fuel the crew did not consider diverting to other stations like Prayagraj, etc. which was closer to Rewa than Varanasi and instead kept on attempting to land at Rewa. There was inadequate preparedness to respond to changing situations or emergencies.

During the process of finding some visual cues to identify their position the CFI kept on descending the aircraft. This was also evident from the fact that the last position relayed by the aircraft was "200 feet/0.8 Nm" before it hit the trees/concrete buildings and subsequently resulted into the accident.

In view of the above, it is inferred that the decision of CFI to carry out night flying activities at low visibility conditions and continuing the flying training even in deteriorating visibility was a major contributory factor to the accident. Further, not attempting diversion to some other nearby airfields shows lack of planning and preparedness by the organisation in emergency situations which was also a contributory factor to the accident.

2.4 Organizational Aspect

2.4.1 Weather Minima

The weather minima procedures given in the TPM of the organisation approved by DGCA had two separate procedures defined for Instructors & Students. For instructors it is defined that

"All dual flights are governed by the weather minima specified in DGCA regulations. VFR flight training is carried out when visibility is 5km or above the weather minima. An AFI/FI may operate with special VFR subject to authorisation from CFI/Dy CFI."

For students it is clearly defined that

"Students in FAA follow the VFR rules for solo flying training."

There is no DGCA regulation for carrying out flying training activities under special VFR. The flying training are supposed to be carried out in VFR conditions only. However, the DGCA had issued a flying grant training Circular 02 of 2005 dated 12.04.2005 wherein procedures were given for conducting flying training activities under special VFR i.e. in visibility conditions less than minima required for VFR flights. There is no clarity in the above procedures given in the TPM regarding what procedures (for weather minima) will be followed for conducting flying training in respect of dual flights. These procedures probably have been documented referring the flying grant circular 02 of 2005, however, the detailed procedures which needs to be followed are not documented. The non-clarity in the existing regulation for weather minima was also evident on the day of accident wherein the CFI had a long discussion with other instructors and someone over phone to clarify the existing regulations before deciding to carry out night flying exercise at low visibility conditions. Further, the procedures defined in the flying

grant training circular 02 of 2005 pertained to day flying only and there is no mention of night flying. However, in this case the same was utilized for night flying activity.

2.4.2 Procedures for analyzing weather condition

The organisation has developed some procedures to obtain MET information and as per the TPM the same is being obtained from IMD website. There is no laid down SOP for analysing the local weather before operating the flight. The procedure provided in the TPM only talks about how to take weather from online platforms. It will give weather for stations having MET facility which may be helpful in analysing the weather conditions for carrying out cross-country flights, but may not be feasible for carrying out the local flying sorties. On enquiring it was informed by the instructors that as a practice the organisation obtains the weather and trends through online for nearby stations like Varanasi, Prayagraj, Khajuraho, etc. They then analyse this MET information obtained from nearby stations and conduct the training flights accordingly.

There is no visibility chart maintained by the organisation to assess the local visibility conditions, however, on enquiring it was informed by the instructors & students that there is a school tower at approximately 2Km away from the airstrip towards the runway 25 side which is used as a visibility marker to analyse the existing local visibility conditions for operating day flights. This practice itself is not adequate to conduct training flights under VFR conditions. There was no specific visibility marker identified to analyse the visibility conditions for night flying. The instructors informed that they use red-colored obstacle light on the brick factory chimney located towards runway 07 side, as well as nearby national highway road lights for reference during flight only. These were not documented anywhere and moreover, they are not reliable as it is not sure whether these markers will be available all the time during flying. In the absence of local MET facility there should be a proper laid down procedures for analysing the local weather conditions. Non-existence of any specific procedure including visibility charts for analysing the local weather leaves everything on the perspective of respective instructor/students to have their own judgment which may not be correct always.

Hence, from the above, it is evident that the night flying exercises were being carried out based on pure discretion of the authorizing instructors. The authorizing instructors were carrying out night flying exercise based on their own assumption rather than assessing the visibility through a specific arrangement to ensure that the local visibility conditions meet the required criteria for conducting flying training exercise. In the present case also, the same situation existed wherein the CFI based on his own assessment carried out night flying training in marginal weather conditions which was not suitable for conducting flying training.

Further, in the subsequent para of the TPM it is mentioned that post obtaining all the relevant weather information from the aforementioned procedure, the operations officer must ensure the met register is timely updated within the respective columns provided. The organisation had a dedicated staff for updating weather information on the MET register. The staff updates weather on MET register after obtaining them online through various websites including IMD. Apart from this as a practice the instructors/students also obtain MET information themselves through online by referring to these websites. However, on the day of accident, the night flying

training started at about 1930 hrs IST, however, the MET register was updated till 1800 Hrs IST only.

2.4.3 SOP for night flying activities at Rewa

There are no requirement/guidelines issued by DGCA regarding arrangements/procedures to be followed by FTOs for carrying out night flying exercises at uncontrolled airfields such as Rewa where facilities for night flying were not available as on date of accident. Further, there is no DGCA requirement which stipulates that an organisation needs to formulate separate night flying SOP for such airstrip. However, DGCA has been giving approvals to individual FTOs for carrying out night flying exercise from their base on case-to-case basis. The individual FTOs are submitting a separate SOP for conducting night flying from their respective base which is then approved by DGCA.

The organisation was earlier based in Faizabad but later shifted their base to Rewa and started flying training activity at Rewa in 2019. The organisation had a separate night flying SOP for Faizabad Airfield approved by DGCA dated 31.12.2014 wherein detailed procedures/requirements were given for carrying out night flying activities. However, no such SOP was formulated for conducting night flying exercise at Rewa. The SOP formulated between the Organisation and ATC, Varanasi mentioned that the night flying approval at Rewa has been granted by DGCA vide its Certificate of Approval dated 20.11.2019. There was no mention of 'Night flying' in the Certificate of Approval given by DGCA. However, it was mentioned in the Certificate of Approval that the operations will be conducted in accordance with the appropriate TPM. Hence, the night flying exercise at Rewa were carried out as per the DGCA approved TPM. The DGCA approved TPM of the organisation had following information regarding night flying: -

"Adequate lightning is available for night flying operations; runway, taxiway lightning is done with the help of goose neck lamps as per the night flying approval of the academy. Aerodrome beacon as per the rules and anti collision light on ATC is available and sufficient light is available for ground signal area with wind sock."

Other than this, there was no separate SOP given in TPM regarding night flying training exercise. The organisation may have been following the procedures as stipulated in the DGCA approved SOP for night flying activities designated for Faizabad base, however, there is no documented guideline which clearly talks about the procedures/arrangements required to carry out night flying activities irrespective of the airfield. A designated guideline/procedure as part of the TPM will remove any ambiguity in this regard and there will be no requirement for formulating a separate SOP and getting it approved by DGCA for carrying out night flying exercise.

2.4.4 SOP for co-ordination between FAA and ATC, Varanasi (VEBN)

The organisation had formulated a SOP dated 12.08.2019 in co-ordination with ATC, Varanasi which was later revised on 05.06.2020. The SOP has been formed for flying training exercises to be carried out from Rewa airfield. In the said SOP it is mentioned that these SOPs has been compiled for smooth and efficient flying operations, ensuring comprehensive air safety and for seamless coordination with ATC Varanasi. However, during the investigation it was observed that these SOPs were not followed by the organisation diligently.

Some of the observations made are as follows: -

- **Prior information regarding the roster of all flying training activities at Rewa:** - As per the SOP the organisation was required to forward through e-mail the roster of all flying training activities at Rewa within 10 Nm upto 4000' AGL of Rewa ARP (designated as 'Local Flights') and cross-country flights to Varanasi ATC along with copy to Prayagraj and Khajuraho ATCs one day in advance. However, it was observed that the same was not being carried out by the organisation as on date of accident. It was also mentioned that necessary coordination will be effected over telephone, however, no such co-ordination were made by the organisation with Varanasi ATC. As per the information given by the instructors as a practice, they call Prayagraj ATC before operating the night flying exercise. However, the same is not documented anywhere in the organization's documents. The call made to ATC, Prayagraj before commencing the night flying exercise on the day of accident could not be corroborated as no evidence in this regard was provided by ATC, Prayagraj.
This lack of co-ordination by the organisation with ATC, Varanasi was evident during the accident when the aircraft was diverted to Varanasi. The instructor (on ground) called Varanasi, ATC and informed about the situation. The ATC, Varanasi was not aware of such flight and the instructor had to explain about the flight and the current situation during which considerable time was lost as the aircraft had already set course to Varanasi. ATC, Varanasi then informed instructor about the NOTAM for runway closure which nobody in the organisation was aware of. The controller asked instructor to go through the NOTAM and revert. The instructor could not find the NOTAM and took help of controller to know the contents of NOTAM. However, the instructor passed on the information to CFI through RT that there is NOTAM at Varanasi for runway closure. The CFI then decided to turn back to Rewa to try another attempt for landing during which it met with the accident. This clearly reflects that there was no co-ordination between the organisation and ATC, Varanasi regarding flying training exercise being carried out at Rewa. Had the organization followed the said procedure stated in the SOP, the information regarding the flying training exercise and NOTAM could have been available with respective organisation.
- **Diversion to Satna:** - It was mentioned in the SOP that Satna will be the alternate airport for diversion, however, it was meant mainly for day flying only as Satna does not have any night flying facility available. There is no clear instructions or procedure documented in the TPM or any SOP formulated for the possible alternate airport in case of any such emergency during the local flying also.
- **ATM-NOC for flying training activity at Rewa Airfield:** - The organisation obtained an NOC from AAI for carrying out flying training activity at Rewa airfield. AAI gave the NOC vide their letter dated 05 August 2019 with some conditions. The NOC was initially valid for 01 year only and later its validity was extended upto 19.12.2022. Hence, the NOC was not valid as on date of accident. As per the NOC all local flying activities was supposed to be carried out as per Certificate of Approval given by DGCA and as per the procedures laid down in the SOP, however, the night flying activities on 05 Jan 2023 was carried out at conditions well below VFR requirements.

From the above, it is evident that the SOP regarding co-ordination between the organization and ATC, Varanasi existed but it was not executed in true letter and spirit. The organisation failed to comply with the existing procedures and ATC, Varanasi also did not ensure that these SOPs are being followed by the organisation. Proper co-ordination among themselves could have averted this accident. Although expiration of validity of ATM-NOC has no bearing on the accident, however, it further reflects poor co-ordination. Further, there was no clarity regarding alternate airports in case of emergency as no such procedure has been documented for alternate airports. The crew did not consider diverting to some other alternate airport also reflects lack of planning for conduct of flying training activities.

2.5 Non clarity regarding existing regulations on flying training activities

DGCA had issued a Flying Grants Advisory Circular 02 of 2005 dated 12.04.2005 for “Flying under Special VFR by Flying Clubs/Training Institutes when Visibility is less than 5 Km”. The circular stipulates some criteria for conducting flying training when the visibility is less than 5 Km at controlled/uncontrolled airfields in co-ordination with ATC authorities available at the airport where the Flying clubs/Training Institute is situated. The circular mentions following criteria: -

- (a) One Aircraft When visibility is not less than 1.5 Km. with a Qualified Flight instructor/Assistant Flight Instructor on board holding valid Instrument Rating.
- (b) Two Aircraft When visibility is not less than 3.5 Km. only one solo aircraft in circuit may be authorised by CFI/FII only and the other aircraft shall be flown with a QFI /AFI holding valid Instrument Rating.
- (c) All Aircraft When the visibility is 5 Km or more for all Dual / Solo flying.

The circular also mentions that the above criteria shall be applicable for all Day Flying training operations conducted by Flying clubs/Training Institutes at the discretion of CFI/FII who should be physically present during all such flying operations.

During the investigation it was observed that there was no clarity regarding validity of this circular as it was not available on the DGCA website. However, it was found that the circular was part of TPMs of some FTOs which were approved by DGCA. AAIB in one of its earlier accident investigations that occurred in 2017, issued a safety recommendation regarding the said circular. In response to the same, DGCA communicated to AAIB vide e-mail dated 04.06.2021 that the said circular was not valid and has been deleted. However, the references of the said circular have continued to remain in the TPMs of some FTOs which were approved by DGCA.

The criteria mentioned in the said circular was not part of the DGCA Approved TPM of the FAA or documented in the SOP with ATC, Varanasi or any other SOP formulated by the organisation. However, in the procedures defined for weather minima for instructors it was mentioned that “An AFI/FI may operate with special VFR subject to authorisation from CFI/Dy CFI”. Further, during the interaction with other instructors of the organisation it was found that they were

referring to the same circular when asked about conducting the flying training operations under such visibility conditions.

The same was evident on the day of accident also. The CFI, Dy.CFI and an FI who were rostered for night flying exercise on the day of accident were discussing about the existing regulations before carrying out the night flying exercise as the visibility conditions were well below the minima required for conducting VFR flights. The discussions went on for a while as the night flying activities which were scheduled to start from 1800 Hrs IST was delayed more than an hour. Even after lot of discussion held between the instructors, the CFI was not sure about the regulations and whether to conduct the training flights in such low visibility conditions, hence, CFI called someone over telephone to seek clarifications. After lot of deliberation, they probably took reference of the Flying Grants Circular 02/2005 and accordingly decided to operate only one aircraft after assessing the local visibility at that time. The procedures defined in the circular was applicable for day flying only, however, the same was utilized for night flying also.

During investigation of this accident and an accident that occurred earlier in the year 2022, AAIB sought clarification from DGCA regarding validity of Flying Grants Circular 02 of 2005. DGCA, however, gave a clarification through a public notice dated 22.05.2023 published on its website which mentioned that *“The Flying Training /Flying Grant/Glider Training Circulars issued by DGCA or any other circular pertaining to flying training/glider training, which are not available on DGCA website stand cancelled with immediate effect.”*

DGCA also sent an e-mail in this regard to all FTOs specifically mentioning the flying grants circular 02 of 2005 stating that the said circular has been cancelled referring to the public notice dated 22.05.2023. The DGCA further advised all FTOs to amend their TPM as per ENR 1.2 (Visual Flight Rules) of eAIP India.

From the above, it is evident that the said circular was not valid as on date of accident. However, the references of the same in TPMs of some organisation and the fact that they were approved by DGCA created misperception among the FTOs including this organisation that the circular was still valid as on date of accident. Further, the procedures defined in the circular was applicable for day flying only, however, in this case the same was utilized for night flying also. Similarly, the DGCA approved TPM of the organisation (FAA) also mentions Special VFR for weather minima defined for instructors without mention of its applicability during the day or night. Further, as on date of accident, no instruction was given by DGCA to FTOs regarding non validity of the Flying Grants Circular 02 of 2005. Hence, non-clarity regarding the existing regulations among the instructors (including the CFI) of the organisation contributed to the accident.

2.6 Communication between FAA and ATC, Varanasi

The investigation team perused the tape transcript and heard the replay of the audio tape for the communication made between one of the instructors of FAA and the ATC controller. Following was observed:

- The instructor called the ATC, Varanasi for diversion of the aircraft as the CFI had already set course to Varanasi due to low visibility at Rewa.
- As per the transcript the conversation started at 175042 UTC wherein the instructor called ATC Varanasi to explain about the situation and requested to co-ordinate for landing. The controller asked instructor regarding details of the flight and asked to call back in 05 minutes as they need to check the MET information like weather trend and visibility before the aircraft can be accommodated for diversion. There was no discussion regarding NOTAM at this point of time. The conversation ended at 175322 UTC.
- At 175500 UTC the instructor again called ATC and the controller informed about the NOTAM for runway closure and asked instructor to refer the same. During this conversation they were discussing about the NOTAM wherein the controller was continuously asking instructor to refer the NOTAM which the instructor was not aware of. The instructor was not able to find the NOTAM online and requested controller to give more information. The instructor also informed that the aircraft had already set course with endurance of 03 hours 30 minutes. The controller gave details such as timing of runway closure, NOTAM number and even read the contents of the NOTAM. The controller finally asked instructor to refer the NOTAM and revert accordingly. The conversation ended at 175640 UTC.
- The instructor after conversation with ATC, passed on the information to CFI through RT about the NOTAM for runway closure and conveyed that Varanasi will not be able to accommodate the aircraft for landing. On analyzing the initial conversation between ATC, Controller and the instructor, it was evident that the ATC controller did not confirm that the runway can be made available for landing and asked instructor to refer the NOTAM and revert accordingly. However, the ATC, Controller did not convey at any point that the aircraft cannot be accommodated for landing at Varanasi. Hence, the interpretation of the instructor in respect to the communication made with the ATC controller regarding the NOTAM was incorrect. The investigation team tried to analyze the reason why the controller asked instructor to refer the NOTAM instead of confirming that the runway can be made available for landing as per the NOTAM. The controller stated that during the entire conversation no urgency was shown by the instructor due to which the controller took normal time for co-ordination. The investigation team during the replay of the tape observed that the instructor although explained the existing emergency situation to the controller but did not use any term like “emergency” or any exigency was shown which could have prompted the controller to take immediate actions to accommodate the aircraft.
- The instructor did not revert to ATC, Varanasi to apprise about the situation until the controller called instructor at 180638 UTC i.e. about 10 minutes after the end of last conversation. The controller asked about their intentions as they have mentioned that the aircraft had already set course. The instructor replied that they referred the NOTAM for runway closure and informed that the aircraft that time had already set course to Varanasi and was holding at 10-15 NM from Rewa for final confirmation from Varanasi. The conversation thereafter was again regarding the NOTAM wherein the controller was informing about the runway closure due to some civil work. The instructor again requested that, if possible, can they accommodate the aircraft for which the controller replied that the runway is closed but in case of emergency if they want to divert, they need to inform 45

minutes prior as mentioned in the NOTAM to clear the runway. The controller further confirmed if they are trying to land at Rewa and the instructor confirmed the same. The conversation ended at 180833 UTC.

- The next conversation started at 184513 UTC wherein the controller enquired about the aircraft accident which was confirmed by the instructor.

In view of the above, it is evident that the instructors and others in the organisation were not aware of the NOTAM. There was lack of planning regarding diversion of the aircraft in case of such emergency. Lot of time was consumed just discussing on the details of the NOTAM. The information given by the controller to instructor about the NOTAM for runway closure was incorrectly interpreted and the information passed on to the CFI was incorrect. Further, the instructor did not read the NOTAM properly as the requirement of prior notification of 45 minutes in case of emergency was not gone through by the instructor until the controller read out the same. However, by that time the incorrect information about runway closure and it cannot be made available for diversion was already conveyed to the aircraft.

The instructor explained the entire situation to controller; however, no urgency was shown which made the controller to take normal time for co-ordination. Irrespective of the lack of urgency shown by the instructor, the controller could have taken necessary actions required to accommodate the aircraft for landing especially when it was informed that the aircraft had already set course for Varanasi. The controller was prompt to call back the instructor to enquire about the situation but was not assertive enough to confirm that the runway can be made available for landing when it was already informed that the aircraft had 03 hours 30 minutes of endurance. Hence, proper co-ordination between the controller and the instructor could have resulted in diversion of the aircraft to Varanasi and the accident could have been averted.

2.7 Circumstances leading to the accident

In winters especially during the month of January in most part of the Central/Northern part of India the visibility is generally low due to setting of fog which affects the flying training operations. The same was evident in Rewa wherein during the last 07 days prior to the day of accident, the visibility was not conducive to carry out the flying training exercise. Hence, the flying training exercise could not be carried out as per the schedule. Some flying training activity was carried out during the day time; however, no night flying exercise could be carried out during this period. This lack of flying in the preceding 07 days probably prompted the CFI to carry out the night flying exercise on the day of accident. The CFI probably imposed undue commitment upon himself to conduct the flying training exercise of the two students who were left with only 01 hour of night flying exercise to complete the requirement of 185 hours of flying training on single engine aircraft. The CFI was aware of the fact that the prevailing visibility conditions were well below the minima required for VFR flights. Hence, before starting the night flying exercise, the CFI had a discussion with Dy.CFI and other instructor regarding the existing regulations which may allow them to carry out flying training at such low visibility conditions. The non-clarity regarding the existing regulations prolonged the discussion between CFI and other instructors. The CFI also called someone on phone to clarify the issue.

The fact that the DGCA approved TPM of the organisation allows instructors to carry out Special VFR flights and the misperception that the Flying Grant Circular 02 of 2005 was still valid, they probably took references of procedures mentioned in the circular. Accordingly, the CFI decided to fly only one aircraft for night flying training. As the CFI was already committed to conduct the flying training exercise, he decided to undertake the exercises himself as scheduled. The other two instructors cancelled their flights.

The night flying training started at low visibility conditions which kept on deteriorating as the fog was becoming denser with time. However, the CFI continued the flying training exercise and completed two training sorties. During the third night flying exercise (GFT by night) with the involved student pilot, the CFI had already supervised three landings and completed the flying training exercise as per the requirement. During this time there was sudden setting of dense fog and the visibility deteriorated further. However, the CFI did not consider the deteriorating visibility and decided to carry out one more circuit with the student pilot. While the aircraft turned for the final leg for landing, the crew could not locate the runway. The fog was so dense that the CFI and student pilot could not identify any visual cues to land the aircraft. They tried several attempts to land but could not sight the runway or any other ground reference to land the aircraft. The instructors on ground and the student manning the ATC also tried to help the crew on RT but the crew could not ascertain their position and sight the runway or airfield.

The CFI then decided to divert to Varanasi and accordingly set course to Varanasi. The instructor on ground communicating on RT was asked to co-ordinate with ATC, Varanasi to accommodate the aircraft for landing at Varanasi.

There was a NOTAM at Varanasi for runway closure, but nobody in the organisation was aware of it. ATC, Varanasi or any other nearby stations were not aware about the night flying training exercise being carried out as the flying schedules were not shared by the organisation to ATC, Varanasi or other nearby stations as per the requirement of the SOP between the organisation and ATC, Varanasi. Due to this lack of co-ordination, lot of time was consumed during the conversation between the instructor and ATC, Varanasi.

The instructor explained the situation to ATC controller and asked for clearance to accommodate the aircraft for diversion. However, no exigency was shown by the instructor during conversation with the controller. The controller informed instructor about the NOTAM and asked instructor to refer it and revert. The controller even read the contents of the NOTAM, however, during this conversation, the controller was not assertive enough to confirm that the runway can be made available in case of emergency. Due to this improper communication and inadequate information regarding the NOTAM, the instructor mis-interpret the conversation with the controller and incorrect message was conveyed to the CFI on RT that Varanasi will not be able to accommodate the aircraft for landing as there is NOTAM for runway closure at Varanasi.

Due to lack of planning/preparedness to respond to such emergency situations, the CFI did not consider diverting to other nearby stations such as Prayagraj, etc. and decided to set course back to Rewa to try another attempt despite having sufficient endurance for diversion.

Thereafter, the CFI carried out many attempts for landing but could not locate the runway/aerodrome as the fog was very dense. The CFI kept on trying to identify some visual cues on ground to ascertain the aircraft location with respect to the airfield. During this process of looking for the visual cues, the CFI kept on descending the aircraft during which the crew got completely disoriented. Moment before the crash, the CFI relayed their position as “at 200 feet and 0.8 Nm” which was the last call made by the aircraft. While the CFI kept on descending the aircraft, it hit one of the trees before impacting the concrete structures (terrace of a house and the temple tower) and subsequently impacted the ground.

3. CONCLUSION

3.1 Findings

- 3.1.1 The Certificate of Airworthiness, Certificate of Registration and Airworthiness Review Certificate of the aircraft were valid on the day of accident.
- 3.1.2 The aircraft and its engine were being maintained as per continuous maintenance program approved by the DGCA. All other laid down requirements pertaining to serviceability of aircraft were complied with.
- 3.1.3 No abnormality was observed on the aircraft by the crew during the pre-flight check or during the entire flight. The serviceability of the aircraft did not contribute to the accident.
- 3.1.4 The CFI and the Student pilot were qualified to operate the flight and their licenses and medical were valid as on date of accident.
- 3.1.5 There was no met facility available at Rewa. On the day of accident, the Metrological report for nearby reports at the start of night flying showed visibility well below the minima required for VFR flight. As per the eyewitnesses the visibility kept on deteriorating with time during the night flying training.
- 3.1.6 The organisation has not developed any means or arrangements to assess the local visibility at Rewa like visibility charts, etc. They have identified some visibility markers for day flying which are not reliable and were insufficient to conduct flying training operations. There was no visibility marker identified for night flying.
- 3.1.7 The weather minima procedures defined in the DGCA approved TPM of the organisation states that special VFR flights may be conducted by instructors subject to authorization from CFI/Dy.CFI. However, there is no DGCA regulations which allows flying training activities under special VFR conditions.
- 3.1.8 The DGCA flying grant circular 02 of 2005 was not valid and was not available on the DGCA website as on date of accident. However, the references of the circular continued to be part of TPMs of some FTOs which were approved by DGCA. Hence, as on date of accident there was misperception among the FTOs including FAA regarding validity of this circular. However, after the accident, the DGCA gave clarification through public notice dated 22.05.2023 and through e-mail dated 23.08.2023 that the circular has been cancelled.
- 3.1.9 On the day of accident, only 04 sorties were conducted during day time due to low visibility conditions. The CFI and other instructors were not assured of existing

regulations and the decision to conduct night flying exercise at low visibility conditions was taken after referring to flying grant circular 02 of 2005. The procedures defined in the circular was applicable for day flying only, however, the same was utilized for night flying in this case.

- 3.1.10 The night flying exercise started at about 1930 Hrs IST and continued till the time of accident, however, the MET register was updated till 1800 Hrs IST only.
- 3.1.11 The CFI continued the flying training exercise even in the deteriorating visibility conditions.
- 3.1.12 The conversation with ATC, Varanasi, for diversion of the aircraft was not interpreted correctly by the instructor. Further, the NOTAM was not properly read and incorrect information was conveyed to the aircraft from ground that the aircraft cannot be accommodated for diversion due to NOTAM for runway closure at Varanasi.
- 3.1.13 The instructor while communicating with ATC, controller on telephone did not use any word like emergency, etc. to show the urgency due to which the controller took normal time for co-ordination.
- 3.1.14 The ATC controller at Varanasi followed the relevant procedures and was prompt in communicating the requirements for diversion as per the NOTAM. However, the controller was not assertive enough to inform that the runway can be made available for landing as per the NOTAM.
- 3.1.15 There was lack of planning or preparedness to respond to the emergency situations such as these. The organisation did not have any policy regarding diversion of the aircraft in such emergency conditions during local training flights.
- 3.1.16 The CFI after setting course back to Rewa kept on trying to identify visual cues to land at Rewa despite prevailing low visibility conditions. The CFI did not consider diverting to other nearby stations such as Prayagraj, etc. while sufficient endurance was available.
- 3.1.17 The crew got disoriented due to dense fog and to find some visual cues, kept on descending the aircraft.
- 3.1.18 No distress or emergency call was given by the crew during the entire flight. The last call given by the aircraft was when CFI relayed their position as “at 0.8 Nm and 200 feet”.
- 3.1.19 The SOP formed for co-ordination between the organisation and ATC, Varanasi was not adhered to by the organisation. The organisation was not aware of the NOTAM and ATC, Varanasi was not informed about the local flying training activities carried out at Rewa.
- 3.1.20 The information provided by the organisation regarding intimating Prayagraj before commencement of flying activities at Rewa could not be corroborated as the same is not documented by the organisation and no evidence in this regard was provided by ATC Prayagraj.
- 3.1.21 The NOC obtained from AAI for carrying out flying training activity at Rewa airfield was valid till 19.12.2022 and hence it was not valid as on date of accident.
- 3.1.22 The organisation was carrying out night flying training from Rewa based on the DGCA approved TPM. However, the TPM did not contained any detailed requirements/procedures to conduct night flying activity.
- 3.1.23 DGCA is issuing separate approvals to FTOs for conducting night flying training on case-to-case basis. There are no requirement/guidelines issued by DGCA regarding

arrangements/procedures to be followed by FTOs for carrying out night flying exercises from airfields where facilities for conducting night flying operations are not available.

3.2 Probable cause of the accident

The accident occurred as the PIC while searching for visual cues for landing in low visibility conditions got disoriented and kept on descending the aircraft during which it resulted into CFIT.

Contributory Factors: -

- Non-adherence to flying training SOPs i.e. the decision to operate night flying training with visibility conditions well below the minima required for VFR and continuing the night flying even with deteriorating visibility conditions.
- Non-clarity of existing regulations which allows flying training operations in VFR conditions only.
- Undue self-imposed commitment to complete flying training requirements of student pilots.
- Lack of planning & preparedness for responding to emergency situations.
- Crew not considering diversion to another nearby airport.
- Non-adherence to SOP formulated with ATC, Varanasi.
- Improper communication between the organisation and ATC, Varanasi which lead to incorrect information being conveyed to the aircraft regarding NOTAM for runway closure at Varanasi.
- Lack of specific arrangements for assessing local visibility at Rewa.

4. SAFETY RECOMMENDATIONS

It is recommended that: -

4.1 The Flying Training Organisation (FAA) may take necessary measures to ensure that

- (a) Everyone in the organisation strictly adhere to the existing regulations/SOPs. The instructors do not take undue commitment to complete the flying training exercise.
- (b) The personnel involved in flying training operations are updated with any notice/circular such as NOTAMs, etc. issued by nearby airports or any other airport where flying is planned.
- (c) The instructors/students make proper co-ordination with external agencies during any situation (including emergency situations) to ensure that correct information is passed to the ATC and to the operating aircraft.
- (d) MET registers are updated time to time with latest METARS till the end of flying training operations.

4.2 DGCA may issue directions as deemed fit to all FTOs operating from uncontrolled airfield (especially where MET facility is not available) to make necessary arrangements such as visibility markers, etc. to assess the local visibility conditions and to ensure that the flying training exercise are being conducted under VFR conditions only. The organisation should

ensure that these arrangements are available throughout the flying training activity (Day or night) and are properly documented in the form of visibility charts/procedures.

- 4.3 DGCA may advise all FTOs to develop detailed procedures to analyze the weather information obtained from nearby stations (in the absence of local MET facility) before operating training flights.
- 4.4 DGCA may advise all FTOs to develop specific procedures for planning and preparedness for handling emergency situations such as in this case while conducting training flights (including local flights). Necessary arrangements may be made with nearby airports for diversion to avoid any unnecessary delay.
- 4.5 DGCA may advise all FTOs operating from uncontrolled airfields to formulate SOP/Agreement with nearby ATC(s) for proper co-ordination and smooth conduct of flying training operations such that the respective ATC is aware of the flying training activities being carried out by the FTO. The compliance of these SOPs/Agreements by the FTOs may be checked during their surveillance/audits.
- 4.6 DGCA may advise AAI to ensure that the ATCs who has developed such SOPs with FTOs to check the compliance of the same such as flying training rosters are received on time, permission/information regarding commencement and end of flying training exercise are received, etc. Further, the ATCs if required, under existing regulations may not permit the FTOs to operate the flying training flights if the SOP is not complied with.
- 4.7 DGCA may develop specific procedures and requirements for carrying out night flying training activities from such airfields where night flying facilities are not available. Further, these procedures/requirements can be made part of TPM of FTOs to avoid any ambiguity and there will be no requirement of giving separate approval to each organization for conducting night flying training. The compliance of the same may be checked during the surveillance/audit of the organisation/airfield.
- 4.8 AAI may sensitize their controllers to be more assertive while communicating with aircraft/operator when asked for assistance in such emergency situations.
- 4.9 DGCA may review TPMs of all FTOs to ensure that there are no differences in procedures defined in the TPM with the existing regulations (including circulars, advisories, any communication issued for compliance) for flying training operations. The compliance of the same may be checked during surveillance/audit of FTOs.
- 4.10 AAIB may co-ordinate with defense authorities as deemed fit to ensure that the information/evidences are made available to AAIB in time for conduct of aircraft accident investigations as per the prevalent Rules.

Date: 06.02.2025

Place: New Delhi

ANNEXURE 'A'

WRECKAGE AND IMPACT PHOTOGRAPHS



Fig 1: First Impact with tree



Fig 2: Second Impact with a tree and aircraft part lying on tree



Fig 3 & 4: Third Impact with concrete terrace of a building and landing gear impact marks



Fig 5: Fourth Impact with a tree



Fig 6: Fifth Impact with temple tower



Fig 7: Final wreckage position after Impact with ground