Final Investigation Report on Accident to M/s Transbharat Aviation Pvt. Ltd. Cessna 152 aircraft VT-CAX on 20-03-2014 at Salon near Fursatganj Airfield, Raibareli

COMMITTEE OF INQUIRY VT-CAX

(Shilpy Satiya)
Air Safety Officer (E), AAIB
Member, COI – VT- CAX

(Amit Gupta)
Director (AED),
O/o Dy. DGCA, Bengaluru.
Chairman, COI – VT- CAX

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 2012, the sole objective of the investigation of an accident shall be the prevention of accidents and not 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 could lead to erroneous interpretations.

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GLOSSARY

AAIB	Aircraft Accident Investigation Bureau, India
AED	Aircraft Engineering Directorate
AME	Aircraft Maintenance Engineer
AMSL	Above Mean Sea Level
ARC	Airworthiness Review Certificate
ATC	Air Traffic Control
AUW	All Up Weight
C of A	Certificate of Airworthiness
CAR	Civil Aviation Requirements
COI	Committee of Inquiry
CPL	Commercial Pilot License
CVR	Cockpit Voice Recorder
DFDR	Digital Flight data Recorder
DME	Distance measuring equipment
DGCA	Directorate General of Civil Aviation
FRTOL	Flight Radio Telephone Operators License
FTO	Flying Training Organisation
Gal/Hr	Gallons / Hour
hrs	hours
ICAO	International Civil Aviation Organization
IFR	Instrument flight rules
ILS	Instrument Landing System
INMCC	Indian Mission Control Centre
ISRO	Indian Space & Research Organisation
ISTRAC	ISRO Telemetry Tracking and Command Network
Lat.	Latitude
Long.	Longitude
Ltr/Hr	Liter/Hour
NDB	Non-Directional Beacon
Nm	Nautical Miles
NSOP	Non-Scheduled Operating Permit
PI	Pilot Instructor
PIC	Pilot in Command
PSWS	Pilot Safety and Warning Supplement
RPM	Rotation per minute
RT	Radio- Telephony
RTR	Radio- Telephony Restricted
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Range
US	United States
USA	United States of America
UTC	Coordinated Universal Time

FINAL INVESTIGATION REPORT ON ACCIDENT TO M/s TRANSBHARAT AVIATION PVT. LTD. CESSNA-152 AIRCRAFT, VT- CAX AT SALON NEAR FURSATGANJ AIRFIELD, RAIBARELY, U.P. ON 20-3-2014

1.	Aircraft	Type	Cessna 152
		Nationality	Indian
		Registration	VT-CAX
2.	Owner		M/s Chetak Aviation, Aligarh
3.	Operator		M/s Transbharat Aviation Pvt. Ltd., New Delhi
4.	Pilot – in –Command		CPL Holder
	Extent of injuries		NIL
5.	Co Pilot		CPL Holder
	Extent of injuries		NIL
6.	Date & Time of Incident		20-03-2014; 0811 UTC
7.	Place of Accident		Salon, Near Fursatganj Airfield, Raibarely , U.P.
8.	Last point of Departure		Birsa Munda Airport, Ranchi
9.	Intended landing place		Fursatganj Airfield, Raibarely
10.	No. of Passengers on board		NIL
11.	Type of Operation		Positioning flight
12.	Phase of Operation		During descend
13.	Type of Accident		Forced Landing due fuel starvation
14.	Co-ordinates of Accident Site		Lat 26° 10" 10' N, Long 81° 27" 30' E AMSL 330 feet

(All timings in the report is in UTC)

SUMMARY:

On 20th March 2014, M/s Transbharat Aviation Pvt. Ltd. Cessna-152 aircraft VT-CAX was involved in a forced landing accident while operating a flight from Ranchi to Fursatganj Airfield, Raibarely. The flight was carried out for returning the aircraft from lessee (Transbharat) to the lessor i.e. M/s Chetak Aviation, Aligarh. The flight was planned as Ranchi- Fursatganj Airfield, Raibarely- Aligarh.

Aircraft was cleared for take-off by ATC Ranchi at around 0336 UTC to fly to Fursatganj Airfield, Raibarely. Aircraft was in the command of Pilot in Command (PIC), who was a freelance pilot authorized by Transbharat & Co-pilot, who was Pilot Instructor (PI) of M/s Alchemist Aviation Pvt. Ltd. Another Cessna152 aircraft VT- CHA which was also to be returned from lessee (Transbharat) to the lessor i.e. M/s Chetak Aviation, Aligarh, took off after 04 minutes for Fursatganj Airfield, Raibarely along with VT-CAX.

Enroute the aircraft VT-CAX was flying at 4500 feet with 05-10 knots head wind. Around 45 Nm inbound ATC Varanasi, instructed VT-CAX to make 25 DME arc due traffic and then set course for Fursatganj Airfield. After passing Varanasi, pilot contacted Fursatganj ATC which allowed aircraft to descend to 3500 feet & further to 2100 feet. At around 6 Nm from the Fursatganj Airfield, aircraft engine shut down. Pilot tried to restart the engine but engine didn't start. Pilot communicated MAY DAY call (3 times) to Fursatganj ATC at 0807 UTC and carried out forced landing in a paddy field at around 0811 UTC at Radial 120. Aircraft rolled about 100 meters before hitting a mud -bund and toppled on nose of the aircraft. There was no fire and both the pilots escaped without injury. Aircraft was substantially damaged in the accident.

Ministry of Civil Aviation vide order No. AV 15018/06/2014-DG dated 8th May 2014 constituted a committee of inquiry to investigate the cause of the accident under Rule 11 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2012. The committee includes Sh. Amit Gupta Deputy Director-AED, DGCA as Chairman and Ms. Shilpy Satiya Air Safety Officer, AAIB as member.

The Committee of inquiry determined the probable cause of accident as "Improper fuel planning resulted in fuel starvation and loss of engine power which caused forced landing of aircraft in a paddy field".

Contributory factor

Lack of Supervision by M/s Transbharat Aviation and ferry flight by pilots who were pre occupied with other duties.

1. FACTUAL INFORMATION.

1.1 History of flight

On 20th March 2014, M/s Transbharat Aviation Pvt. Ltd. Cessna-152 aircraft VT-CAX was involved in a forced landing accident while operating a flight from Ranchi to Fursatganj Airfield, Raibarely. The flight was carried out for returning the aircraft from lessee (M/s Transbharat) to the lessor i.e. M/s Chetak Aviation, Aligarh. The flight was planned as Ranchi- Fursatganj Airfield, Raibarely- Aligarh with PIC & Co-pilot. The PIC was a freelance pilot authorized by M/s Transbharat to carryout flight & co-pilot was working as PI at M/s Alchemist Flying Academy, Jamshedpur.

The Co-pilot (PI) had earlier flown Cessna 152 aircraft VT- CAX solo from Behala Aerodrome, West Bengal to Jamshedpur on 12-02-2014 for duration 01:35 Hrs. VT- CAX was flown from Jamshedpur to Ranchi on 22-02-2014 by involved PIC & Transbharat Pilot as co-pilot for duration 01:15 Hrs. The aircraft was parked at Ranchi from 22-02-2014 to 20-03-2014.

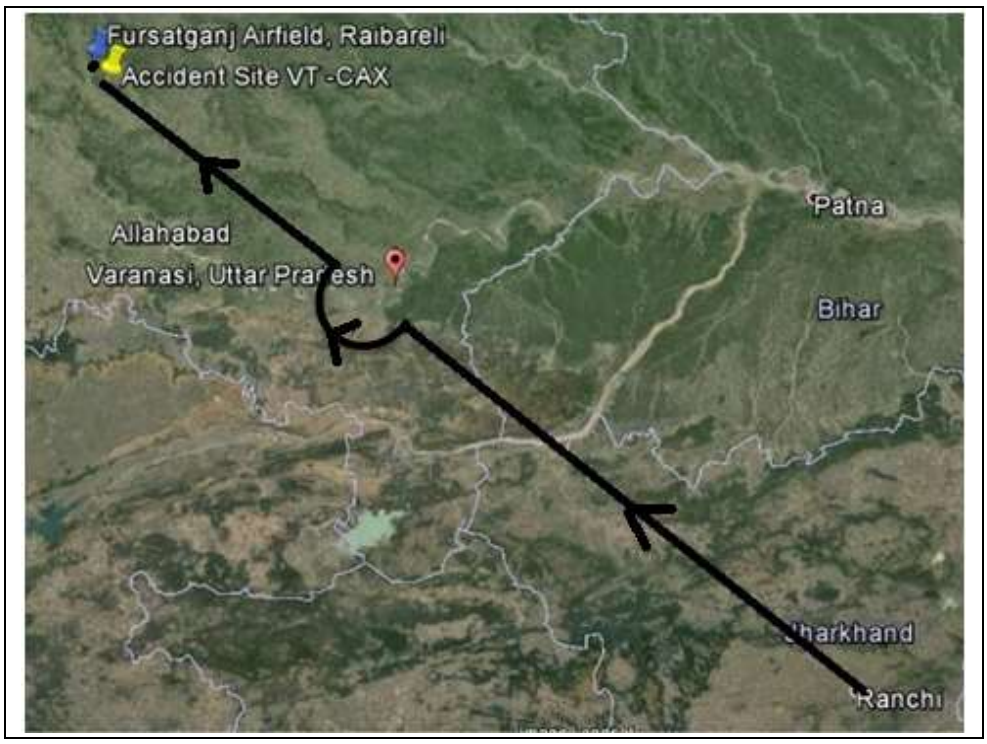
On 20-03-2014, AME carried out preflight inspection at Ranchi before flight and aircraft was accepted by the PIC. As per PIC, no refueling was carried out at Ranchi & there was 125 ltrs. of fuel available on the aircraft with endurance of 06 Hrs. The aerial distance from Ranchi to Fursatganj Airfield, Raebareli was approx. 300 Nm.

The Ground clearances of aircraft at Ranchi & flight plan of VT- CAX was filed by the co-pilot on 19-03-2014 for VFR flight. However, the VFR operation at Ranchi was suspended as visibility was below 5 Km. Pilot requested for startup at 0320 UTC for take-off under special VFR & aircraft took off at around 0336 UTC for Fursatganj Airfield, Raibarely. Radio Telephony (RT) was handled by co-pilot during the flight.

Enroute the aircraft VT-CAX was flying at 4500 feet with 05-10 knots head wind. Around 45 Nm inbound ATC Varanasi, instructed VT-CAX to make 25 DME arc due traffic and then set course for Fursatganj Airfield. After passing Varanasi, the co- pilot of VT- CAX contacted Fursatganj ATC around 42 NM from Airfield. Fursatganj ATC allowed aircraft to descend to 3500 feet & further to 2100 feet. At around 6 Nm from the Fursatganj Airfield while on approach to the final destination, aircraft engine shut down. Pilot tried to restart the engine but engine didn't start.

Pilot communicated MAY DAY call (3 times) to Fursatganj ATC at 0807 UTC and carried out forced landing in a paddy field at around 0811 UTC. The aircraft rolled about 100 meters before hitting a mud -bund and toppled on nose of the aircraft. During the landing pilot did not lower the flap. There was no fire and both the pilots escaped without injury. The aircraft was substantially damaged due forced landing. The total duration of flight was 04 hrs and 35 minutes.

Another, Cessna152 aircraft VT- CHA which was also to be returned from lessee (M/s Transbharat) to lessor i.e. M/s Chetak Aviation, Aligarh took off after 04 minutes from Ranchi to Fursatganj Airfield, Raibarely along with VT-CAX. This aircraft was also piloted by Pilot Instructor of M/s Alchemist Flying Academy, Jamshedpur. However, VT-CHA flying along with VT-CAX successfully landed at Fursatganj Airfield.



Google map of Flight Path showing Flight of VT-CAX from Ranchi-Fursatganj Airfield including 25 Nm Arc at Varanasi.

1.2 **Injuries to persons.**

Injuries	**Crew**	**Passengers**	**Others**
Fatal	NIL	NIL	NIL
Serious	NIL	NIL	NIL
Minor	NIL	NIL	NIL
None	02	NIL	NIL

1.3 **Damage to aircraft.**

The aircraft sustained substantial damage. Following main damages occurred to the aircraft during forced landing in paddy field.

1. One Propeller blade was bent 90° backwards and damaged.
2. Nose landing Gear Assembly sheared off from mounting.
3. Shimmy dampener & both Steering Rods broken from its mounting.
4. Underside belly of aircraft (fuselage portion below cockpit) punctured by nose landing gear.
5. Engine mount cracked and broken at nose landing gear bracket.
6. Firewall damaged at lower side & wrinkles found on firewall.
7. Lower engine cowling & exhaust assembly damaged.
8. Complete fuel filter assembly and fuel line broken from carburetor mounting end.
9. Main landing gear root fairing bulged.

1.4 **Other damage:** NIL

1.5 **Personnel information:**

1.5.1 **Pilot – in – Command:**

AGE	26 yrs
License	CPL
Date of License Issue and Valid up to	16-06-2010 to 15-06-2015
Category	Aircraft
Class	Single Engine Land
Endorsements as PIC	Cessna- 152 and Cessna-172
Date of RTR Issue and Valid up to	25-11-2013 to 24-11-2033
Date of FRTOL issue & validity	16-06-2010 to 15-06-2015
Date of Med. Exam & validity	10-02-2014 to 09-02-2015
Date of English language Proficiency & valid upto	01-03-2011 to 28-02-2017
Total flying experience	327:05 hrs
Total Experience on type	162:30 hrs
Total Experience as PIC on type	131:00 hrs
Last flown on type	22-02-2014
Total flying experience during last 01 Year	13:10 hrs
Total flying experience during last 180 days	01:15 hrs
Total flying experience during last 90 days	01:15 hrs

Total flying experience during last 30 days	01:15 hrs
Total flying experience during last 07 Days	NIL
Total flying experience during last 24 Hours	NIL
Rest period before the flight	22 days

1.5.2 Co-Pilot:

AGE	28 yrs
License	CPL
Date of License Issue and Valid up to	02-07-2009 to 01-07-2014
Category	Aircraft
Class	Single Engine Land
Endorsements as PIC	Cessna- 152 and Cessna-172
Date of RTR Issue and Valid up to	02-06-2009 to 01-06-2014
Date of FRTOL issue & validity	02-07-2009 to 01-07-2014
Date of Med. Exam & validity	21-08-2013 to 20-08-2014
Total flying experience	626:10 hrs
Total Experience on type	494:10 hrs
Total Experience as PIC on type	464:05 hrs
Last flown on type	11-03-2014
Total flying experience during last 01 Year	75:05 hrs
Total flying experience during last 180 days	53:10 hrs
Total flying experience during last 90 days	26:55 hrs
Total flying experience during last 30 days	06:55 hrs
Total flying experience during last 07 Days	NIL
Total flying experience during last 24 Hours	NIL
Rest period before the flight	09 days

Co-pilot was working as Pilot Instructor to M/s Alchemist Flying Academy, Jamshedpur on date of accident. Review of co-pilot log book reveals that there was no entry made in the Pilot log book and Tech log regarding the accident flight carried out on 20-03-2014. Also, the log book was certified for the Month of March 2014 by Chief Flying Instructor of M/s Alchemist Flying Academy, Jamshedpur. After the accident, co-pilot carried Pilot Instructor duty at M/s Alchemist Flying Academy.

The Pilot Instructor had earlier flown solo VT- CAX from Behala Aerodrome, West Bengal to Jamshedpur on 12-02-2014 for duration 01:35 Hrs.

1.6 AIRCRAFT INFORMATION:

1.6.1 General Description:

Cessna 152 aircraft VT-CAX was manufactured by M/s Cessna Aircraft Company USA in 1980.The aircraft is two-seat, fixed tricycle gear, general aviation airplane, used primarily for flight training and personal use. Cessna 152 aircraft is powered with one Avco Lycoming, 4 cylinder, O-235-L2C normally-aspirated, direct drive, air cooled and horizontally opposite, carburetor equipped engines using 100 LL low lead fuel. The engine has a Horsepower rating of 110 BHP with engine speed of 2550 RPM. The aircraft is fitted with fixed pitch Sensenich Propeller of model No.72CKS-O-52 with 2 blades. The aircraft is certified for a single pilot operation. There are two doors. The aircraft was fitted with Long Range Tanks having a total fuelling capacity of 39 U. S. gallon and usable fuel is 37.5 U. S. gallon. (1 U. S. gallon = 3.78541 Liters)

The airframe is of mainly metal construction being primarily of 2024-T3 aluminum alloy with riveted skin. Components such as wingtips and fairings are made from glass-reinforced plastic. The fuselage is a semi-monocoque with vertical bulkheads and frames joined by longerons running the length of the fuselage. The wings are of a strut-braced design and have a 1 degree dihedral angle. The tapered (outboard) portion of each wing has one degree of washout (the chord of the tip section has one degree lower angle of attack than the chord at the end of the constant-width section). This allows greater aileron effectiveness during a stall.

Dual controls are available as optional equipment on the Cessna 152 and almost all 152s have this option installed. However, during the accident flight the dual controls were not removed from the aircraft.

The Cessna 152 is equipped with differential ailerons that move through 20 degrees upwards and 15 degrees downwards. It has single-slotted flaps which are electrically operated and deploy to a maximum of 30 degrees. The rudder can move 23 degrees to either side and is fitted with a ground-adjustable trim tab. The elevators move up through 25 degrees and down through 18 degrees. An adjustable trim tab is installed on the right elevator and is controlled by a small wheel in the center of the control console. The trim tab moves 10 degrees up and 20 degrees down relative to the elevator chord line.

The Cessna 152 is equipped with fixed tricycle landing gear. The main gear has tubular steel legs surrounded by a full-length fairing with a step for access to the cabin. The main gear has a 7 ft 7 in (2.3 m) wheelbase.

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 eight degrees either side of neutral and can castor under differential braking up to 30 degrees. It is connected to the rudder pedals through a spring linkage.

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. It is possible to use differential braking when taxiing and this allows very tight turns to be made.

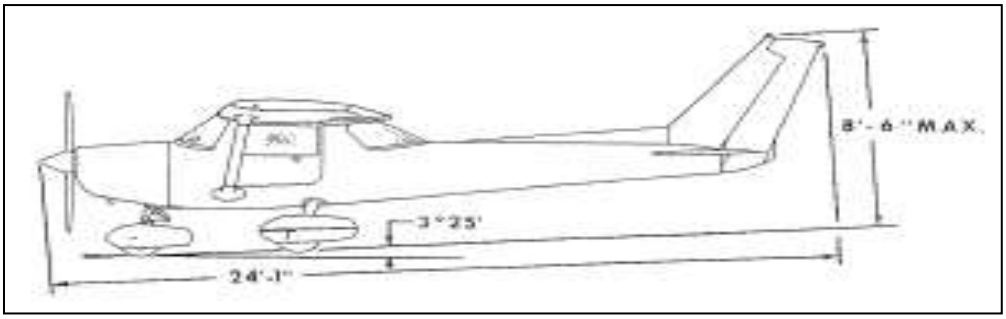
Cessna 152 is also fitted with a parking brake system. It is applied by depressing both toe brakes and then pulling the "Park Brake" lever to the pilot's left. The toe brakes are then released but pressure is maintained in the system thereby leaving both brakes engaged.

General characteristics

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

Aircraft Performance

- Maximum speed: 126 mph (110 knots, 204 km/h)
- Cruise speed: 123 mph (107 knots, 198 km/h)
- Stall speed: 49 mph (43 knots, 79 km/h) unpowered, flaps down
- Takeoff roll: 725 ft (221 m)
- Range: 477 mi (414 nm, 768 km)
- 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: 10.44 lb/ft² (51 kg/m²)
- Minimum power/mass: .066 hp/lb (108 W/kg)



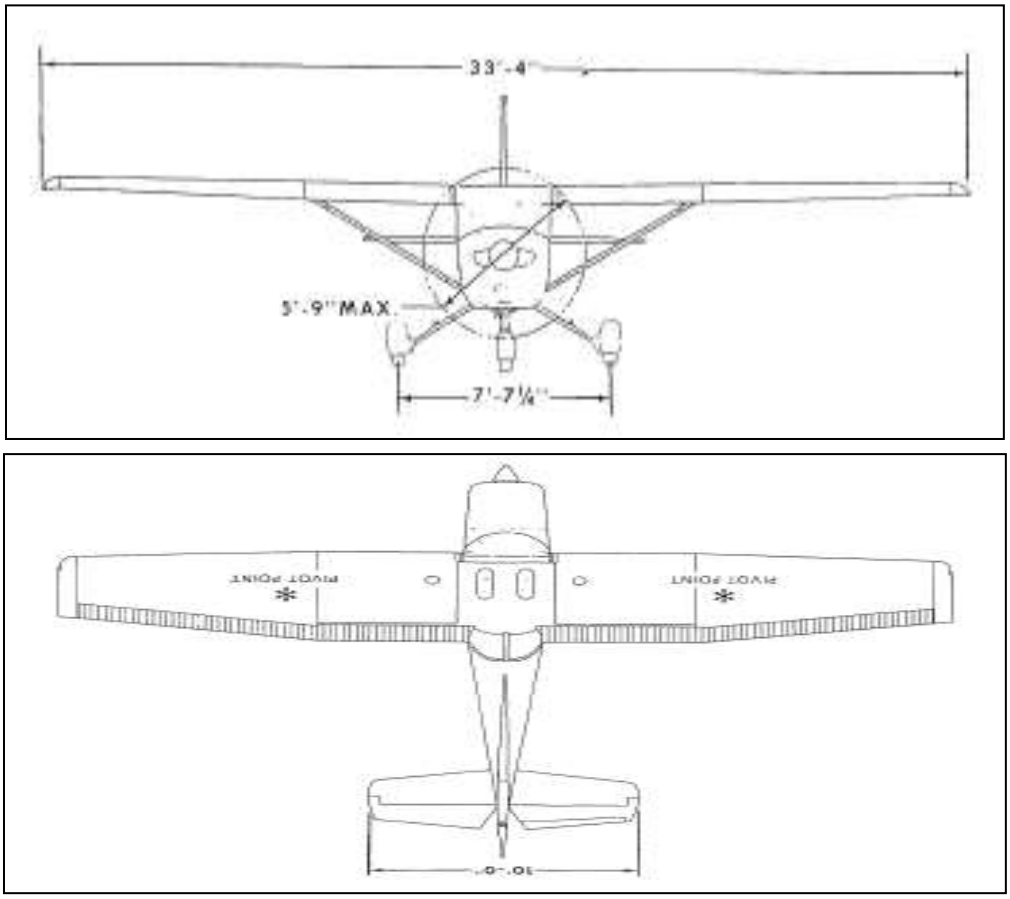


Fig: Three view drawing

1.6.2 Aircraft Technical Information

Aircraft		
1.	Manufacturer	Cessna
2.	Type	152
3.	Aircraft Registration	VT-CAX
4.	Constructor Sl. No.	15284685
5.	Year of Manufacturer	1980
6.	Certificate of Registration No.	3954/4
7.	Certificate of Registration valid upto	05-07-2014
8.	Certificate of Airworthiness No.	6063
9.	C of A renewed on	04-01-2014
10.	C of A valid up to	21-03-2014
11.	ARC issued on	04-01-2014
12.	ARC valid up to	21-03-2014
13.	Category of C of A	Normal
14.	Subdivision category of C of A	Passenger Aircraft

15.	Minimum Crew	01
16.	Aircraft Empty weight	543.41 Kg
17.	Maximum All up weight	759 kg **
18.	Date of aircraft weighment	22/04/2008
19.	Last major Inspection	Operation -04 (200hrs /1 Year)
20.	Last major Inspection carried out on	10-02-2014
21.	Airframe hours Since New	6473:00 Hrs
22.	Airframe Hours since last C of A	03:00 Hrs
23.	Aircraft Usual Station as per C of R	Behela Aerodrome
24.	Aeromobile License No.	A-059/005-RLO (NR) and valid up to 31-12-2014.

Engine		
1.	Manufacturer	Avco Lycoming
2.	Type	O-235 –L2C
3.	Sl No.	L-14614-15
4.	Engine hours Since New	7051:10 hrs
5.	Engine hours Since O/H	619:10 hrs
6.	Date of O/H	14-11-2010
7.	Last major Inspection	Operation -04 (200 hrs/ 01years)
8.	Last major Inspection	10-02-2014
9.	Average Fuel consumption as per fuel oil register	No entry in Register
10.	Average Oil consumption as per fuel oil register	No entry in Register

Propeller		
1.	Manufacturer	SENSENICH
2.	Type	72CK-6-O-54
3.	Sl No.	K 9915
4.	Last major Inspection	Operation -04 (200hrs /1 Year)
5.	Last Major Inspection Carried out	10-02-2014
6.	Total hours Since New	1229:45 hrs

Scrutiny of the Tech log reveled that there was no defect reported on the aircraft before the accident flight. The defect register shows no defect from 11-08-2012 to 22-02-2014. However as per PIC, during flight left fuel quantity gauge was showing correct reading but right fuel quantity gauge was not showing correct reading.

** The DGCA approved weight & balance schedule dated 19-05-2009 shows AUW of aircraft as 760 Kg. However, as per C of R all up weight of aircraft was mentioned as 759 Kg.

As per records, the C of A & ARC of the aircraft was valid till 21-03-2014, which led to compulsion on pilots to fly aircraft on 20-03-2014.

Last entry in Fuel & Oil consumption register was found of dated 29-02-2012. However as per CAR Section 2 Series D Part V requires "the owner/operator shall ensure that the records of fuel and oil consumption are maintained and monitored periodically".

Load and trim sheet of accident flight was not prepared before flight. However, it was computed after flight using empty weight of aircraft and standard weight of Pilot, Co-pilot and found that aircraft was over loaded by 43.41 Kg at take-off from Ranchi.

Empty Weight of Aircraft	535.41 Kg
Standard Weight of PIC	85 Kg
Standard Weight of Co-Pilot	85 Kg
Weight of 125 ltrs of AVGAS (0.72 ltrs/Kg)	90 Kg
AUW	803.41 Kg
Maximum All up Weight of Aircraft as per weight Schedule	760 kg
Difference (Over weight at take-off)	43.41 Kg

1.7 **Meteorological information:**

The METAR at the time of accident at 0830 IST at Ranchi was reported to be fine , prevailing wind variable 05 knots/ 300°, visibility 4 Km, temp 22 deg, QNH 1015 Hpa. The VFR operation was suspended as visibility below 5 Km and PIC of VT- CAX requested operation under special VFR. Enroute weather was fine with 05-10 knots of headwind.

1.8 **Aids to navigation:**

The navigational facilities NDB / VOR / DME & ILS on Runway 31 are available at Ranchi. At IGRUA Fursatganj airfield NDB / VOR / DME & ILS was available. Enroute, aircraft was in contact with ATC.

1.9 **Communications:**

There was two way communications between the aircraft and the ATC. Prior to forced landing VT-CAX had communicated MAYDAY call (3 times) to Fursatganj Airfield ATC.

1.10 **Aerodrome information.**

Birsa Munda Airport, Ranchi having Runway 13 & 31 with dimension 2713M X 45M, navigational facilities NDB / VOR / DME & ILS on Runway 31, Ground Lighting facilities HIRL, PAPI, ASPL and Apron Flood lights.

Fursatganj Airfield, Raebareli airport is operated by Indira Gandhi Rashtriya Udan Academy (IGURA). The coordinates of Airfield are 26.24 85°N and 81.3801°E , AMSL 359 ft. Runway 27 & 09 having length of 6,118 ft made of Asphalt, navigational facilities NDB / VOR / DME & ILS on Runway 09. There was no DGCA approved fuel vendor supplying 100 LL at Ranchi Airport on the date of accident.

1.11 **Flight recorders.**

Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR) were neither fitted nor required on this aircraft as per Civil Aviation Requirements.

1.12 **Wreckage and impact information.**

During examination of the wreckage at site, it was observed that the aircraft was lying in nose down upright condition. The wreckage was confined to one place indicating that there was no in-flight disintegration of the aircraft. One blade of Propeller had bent backward. Nose landing gear was bend backward from mounting and the Station No.0 (firewall) was damaged and pushed back toward cabin.

1.12.1. During forced landing the aircraft moved around 100 meters before hitting the mud- bund as visible by the wheel marks.

1.12.2. In the cockpit, the throttle levers were found to be in the forward position and the mixture was full rich and the flaps were in up position. Fuel shutoff valve was found in ON position.

1.12.3. Complete Fuel filter assembly and fuel line was broken from carburetor mounting. As fuel shutoff valve was found in open position, little fuel spillage was found on ground.

Final rest position of the aircraft in Nose Down condition.

1.13 **Medical and pathological Information:**

No preflight and post flight medical examination was carried out of the crew. After the accident, the PIC and the Co-pilot did not receive any injury.

1.14 **Fire:**

There was no pre or post impact fire.

1.15 **Survival aspects:**

Both the persons on board escaped without any injuries. The accident was survivable. The 406 MHz ELT got activated after the impact & signal were traced by ISRO Satellite. The first message was received by INMCC/ISTRAC/ISRO was at 0811 UTC followed by location data (26 10.1N 81 27.6E) at 0904 UTC on 20-03-2014.

1.16 **Tests and research:**

1.16.1 Engine Strip Examination:

The involved engine of VT- CAX was transported to Delhi and strip examined at Delhi Flying Club, a DGCA approved engine overhaul workshop in the presence of the committee member. Following are the salient observations

The engine was found Intact and no external damage observed. All the accessories were found installed and intact except the carburetor.

Vacuum Pump Coupling found broken

Primer line Cylinder No. 01 found broken due impact.

All Spark Plugs condition was found satisfactory.



The condition of all Cylinders, pistons and its associated parts found satisfactory.


The condition of Crankcase, Crankshaft, Camshaft & Connecting Rods were found satisfactory.

The condition of Oil Pump and housing, Tachometer drive, Vacuum pump drive, Crankshaft gear, Camshaft Gear and Magnetos drive gears were found intact. No damage observed.

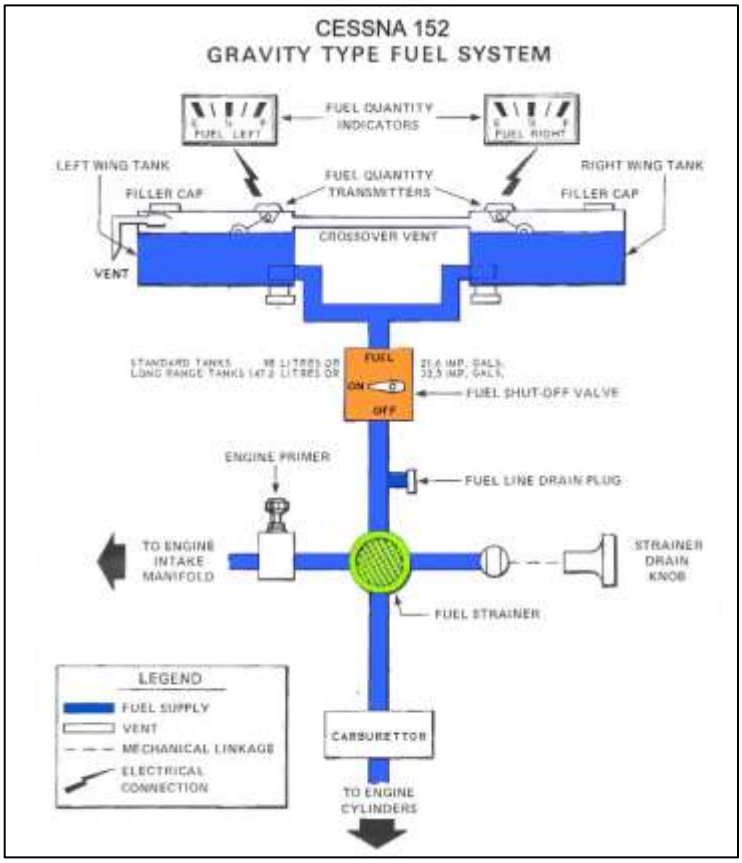
1.17 **Organizational and management information:**

M/s Transbharat Aviation Pvt. ltd is an NSOP Operator having NSOP No. 01/1991 valid upto 28-02-2017. The company is based at Delhi. The company opened a Flying Training Organization (FTO) in name of M/s Transbharat Aviation Pvt. ltd at Behala, Kolkata. DGCA issued Approval to FTO vide AV 22011/2/2009-TRG. dated 26-09-2013 valid for a period one year. The company had three Cessna 152 aircraft (VT- AAE, VT-CHA & VT- CAX). Two aircraft VT- CHA & VT- CAX were taken on lease from M/s Chetak Aviation, Aligarh.

The aircraft VT- CAX was ferried from Aligarh to Behala Aerodrome on 21-08-2012.However, the aircraft was flown by many pilots at Behala Aerodrome before the FTO approval granted to M/s Transbharat Aviation Pvt. Ltd. on 26-09-2013.

1.18 **Additional information***:*

1.18.1. Aircraft Fuel System: The aircraft fuel system was comprised of two long range aluminum fuel tanks in the left and right wings. The system was gravity fed with fuel pick-up from the front and rear of each tank. Both tanks supplied fuel to a common line and fuel selector which had an 'ON/OFF' selection. Fuel then passed through a strainer/filter to the carburetor/engine



1.18.2 Fuel tank venting

Venting for the left fuel tank was via an external vent tube protruding into the airstream on the left wing adjacent to the wing strut. A flapper valve was incorporated within the tank at the vent line to prevent over board fuel spillage or syphoning during flight. The right tank was vented through the fuel cap. To equalise the head of pressure between both tanks, a crossover vent line was fitted.

The Aircraft Flight Manual (AFM) Section 2 – *Limitations*, stated that the maximum fuel capacity for Cessna 152 aircraft fitted with long range tanks as being 39 US gallons (147 L). Of that, 37.5 US gallons (142.5 L) was deemed usable fuel for all flight conditions with 1.5 US gallons (5.7 L) being unusable fuel.

Section 2 had the following note:

> *Due to cross-feeding between fuel tanks, the tanks should be re-topped after each refueling to ensure maximum capacity.*

The Pilot's Operating Handbook (POH) Section 7 – *Airplane & Systems* descriptions further expands on unusable fuel, in that:

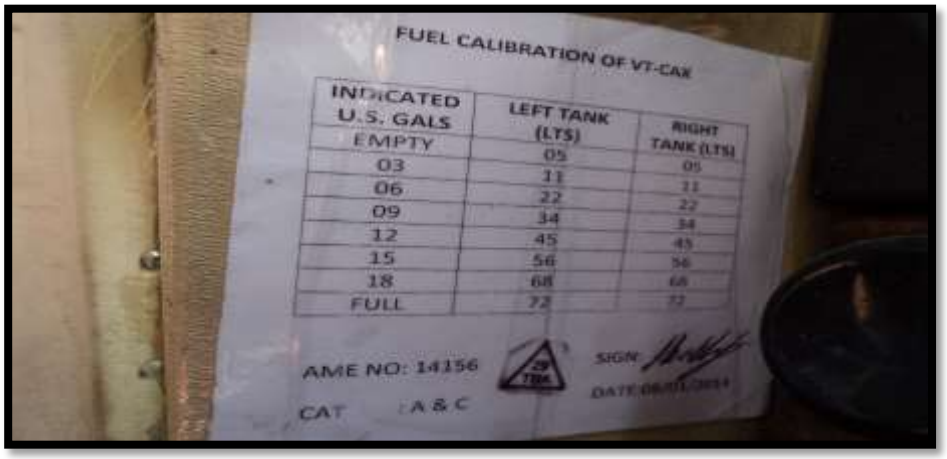
> *The amount of unusable fuel is relatively small due to the dual outlets at each tank. The maximum unusable fuel quantity, as determined from the most critical flight condition, is*

about 1.5 gallons [5.7 L] total. This quantity was not exceeded by any reasonable flight condition, including prolonged 30 second full-rudder sideslips in the landing configuration. Takeoffs have not been demonstrated with less than 2 gallons [7.6 L] total fuel (1 gallon [3.9 L] per tank).

1.18.3 Fuel quantity indication

Fuel quantity was indicated by two gauges in the cockpit. Fuel quantity is measured by two float type fuel quantity transmitters (one in each tank) that provided electrical signals to the gauges and indicated by two electrically operated fuel quantity indicators. The fuel gauges contained two scales: an upper scale in pounds and a lower scale in US gallons. A calibration card decal was installed on the instrument dashboard close to the fuel gauges. That card provided usable litre values for each of the gauge's gallon increments.

Fuel Quantity Indicator of VT- CAX



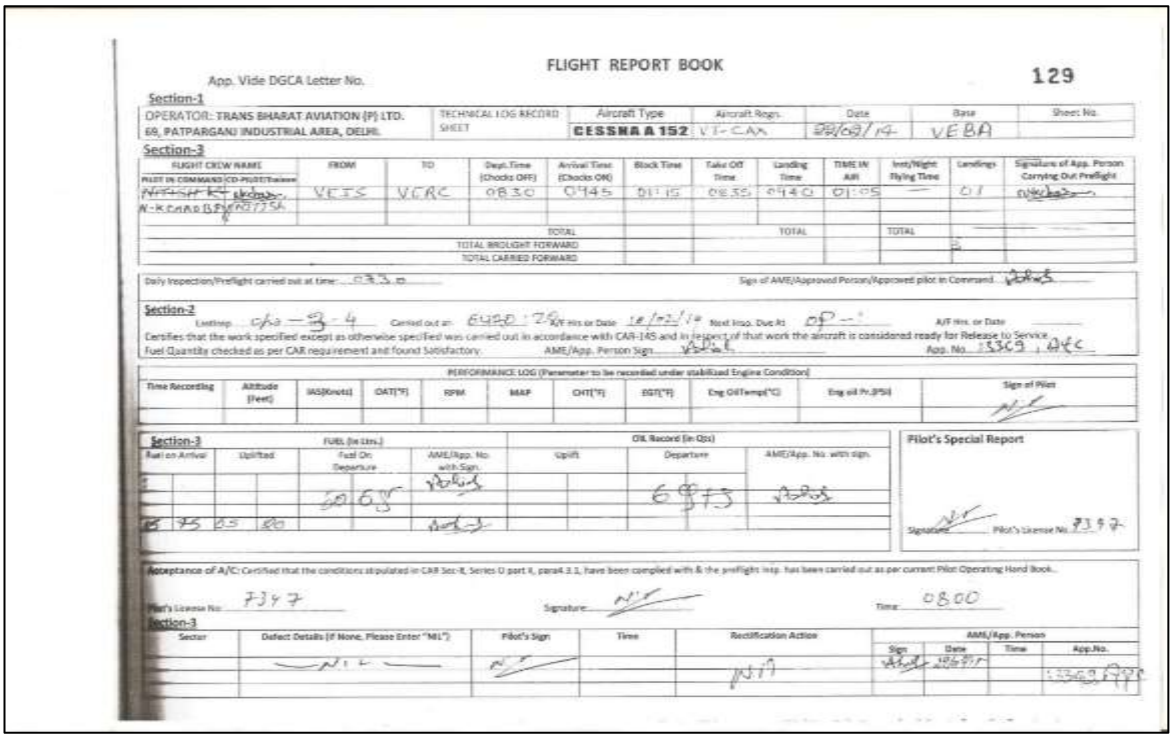
Fuel calibration card of VT- CAX

During flight left fuel quantity gauge was showing correct reading and but right fuel quantity gauge was not showing correct reading.

A physical check of the fuel quantity was accomplished by placing an incrementally marked ‘dipstick’ within each tank and reading the fuel level. The dipstick recorded fuel in litres, which was the unit of measurement used for all fuel calculations in accordance with the operator’s procedures.

1.18.4 Aircraft fuel records

As per requirement of Civil Aviation Requirements Section 2 Series X Part VI, all operators are advised to prepare & maintain logbooks. As per Flight report Book page 129, involved PIC and a pilot from M/s Transbharat operated the flight on 22-02-2014, Jamshedpur-Ranchi of duration 01:15. Fuel uplifted at Jamshedpur was 25 liters and total fuel at departure from Jamshedpur was shown as 125 liters.



FLIGHT REPORT BOOK

App. Vide DGCA Letter No.

129

Section-1

OPERATOR: TRANS BHARAT AVIATION (P) LTD. 69, PATPARGANJ INDUSTRIAL AREA, DELHI.	TECHNICAL LOG RECORD SHEET	Aircraft Type	Aircraft Regn.	Date	Base	Sheet No.
		CESSNA A 152	VT-CAX		VEBA	

Section-3

FLIGHT CREW NAME (PILOT IN COMMAND / CO-PILOT/Trainee)	FROM	TO	Dept. Time (Chocks OFF)	Arrival Time (Chocks ON)	Block Time	Take Off Time	Landing Time	TIME IN AIR	Inst/Night Flying Time	Landings	Signature of App. Person Carrying Out Preflight
	VEJS	VERC	0830	0945	01:15	0835	0940	01:05	—	01	
TOTAL						TOTAL		TOTAL			
TOTAL BROUGHT FORWARD											
TOTAL CARRIED FORWARD											

Daily Inspection/Preflight carried out at time: ... Sign of AME/Approved Person/Approved pilot in Command ...

Section-2

Last Insp. ... Carried out at ... A/F Hrs or Date ... Next Insp. Due At ... A/F Hrs. or Date ...

Certifies that the work specified except as otherwise specified was carried out in accordance with CAR-145 and in respect of that work the aircraft is considered ready for Release to Service.

Fuel Quantity checked as per CAR requirement and found Satisfactory. AME/App. Person Sign ... App. No. ...

PERFORMANCE LOG (Parameter to be recorded under stabilized Engine Condition)

Time Recording	Altitude (Feet)	IAS(Knots)	OAT(°F)	RPM	MAP	CHT(°F)	EGT(°F)	Eng OilTemp(°C)	Eng oil Pr.(PSI)	Sign of Pilot

Section-3

FUEL (in Ltrs.) Fuel on Arrival	Uplifted	Fuel On Departure	AME/App. No. with Sign.	OIL Record (in Qts) Uplift	Departure	AME/App. No. with sign.
		50 65			6 7 5	
75	25	100				

Pilot's Special Report

Signature ... Pilot's License No. 7347

Acceptance of A/C: Certified that the conditions stipulated in CAR Sec-8, Series O part II, para4.3.1, have been complied with & the preflight insp. has been carried out as per current Pilot Operating Hand Book.

Pilot's License No. 7347 Signature ... Time 0800

Section-3

Sector	Defect Details (If None, Please Enter "NIL")	Pilot's Sign	Time	Rectification Action	AME/App. Person Sign	Date	Time	App.No.
	NIL			NIL				

However, as per Flight report Book page 130, the accident flight was operated on 20-03-2014, Ranchi- Fursatganj Airfield, Raebareli of duration of 04 hrs 35 minutes by involved PIC and Co-pilot. No fuel was uplifted at Ranchi and total fuel as per record at on Arrival & Departure was shown as 125 liters. Also name of co-pilot was not entered in the Tech logbook & there was lot of cutting in the logbook.

FLIGHT REPORT BOOK

App. Vide DGCA Letter No.

130

Section-1

OPERATOR: TRANS BHARAT AVIATION (P) LTD. 69, PATPARGANJ INDUSTRIAL AREA, DELHI.	TECHNICAL LOG RECORD SHEET	Aircraft Type	Aircraft Regn.	Date	Base	Sheet No.
		CESSNA A 152	VT-CAX	20/03/14	Ranchi	

Section-3

FLIGHT CREW NAME (PILOT IN COMMAND)	FROM	TO	Dept. Time (Chocks OFF)	Take Off Time	Signature of App. Person Carrying Out Preflight
N K CHAUBEY	VERC	VERB	0310	0315	[illegible]

Daily Inspection/Preflight carried out at time: 7120

Section-2

Last insp: Operation-4 Carried out at: 6478:20 A/F Hrs or Date: 10/02/14 Next Insp. Due at: OP-1

Certifies that the work specified except as otherwise specified was carried out in accordance with CAR-145 and in respect of that work the aircraft is considered ready for Release to Service.

Fuel Quantity checked as per CAR requirement and found Satisfactory. AME/App. Person Sign

PERFORMANCE LOG (Parameter to be recorded under stabilized cruise Condition)

Section-3

Fuel on Arrival	Uplifted	Fuel On Departure	AME/App. No. with Sign	Oil Uplift	Oil Departure	AME/App. No. with sign
60 / 65	—	60 / 65	[illegible]	—	6 / 6.5	[illegible]

Pilot's Special Report

Pilot's License No. 5389

Acceptance of A/C: Certified that the conditions stipulated in CAR Sec-8, Series O part II, para 3.1, have been complied with & the preflight insp. has been carried out as per current Pilot Operating Hand Book.

Pilot's License No. 5388

Time: 08:00 AM

1.18.5 FUEL SYSTEM EXAMINATION

Examination of the aircraft did not find any evidence of fuel leakage from the aircraft fuel lines or fuel system components. Both fuel tank caps were securely fitted with no evidence of in-flight seepage. The aircraft fuel filter was clear of obstruction and there were evidence of fuel spillage on the ground from the filter assembly as it was broken.

The manufacturer did not specifically impose any caveats on the flight profile or types of maneuver performed with low fuel loads for the Cessna 152 aircraft, other than advising that the unusable fuel listed was applicable under ‘reasonable flight conditions’.

The Cessna Pilot Safety and Warning Supplement (PSWS) Section 6, Fuel Management – Flight Coordination vs Fuel Flow provided the following guidance:

It is important to observe the uncoordinated flight or sideslip limitations listed in the respective operating handbook. As a general rule, limit uncoordinated flight or sideslip to 30 seconds in duration when the fuel level in the selected fuel tank is ¼ full or less. Airplanes are usually considered in a sideslip anytime the turn and bank “ball” is more than one-quarter ball out of the center (coordinated flight) position. Unusable fuel quantity increases with the severity of the sideslip in all cases.

The manufacturer did not provide any advice on asymmetric fuel delivery due to the aircraft tank venting configuration. However, the PSWS warned:

In certain maneuvers, the fuel may move away from the fuel tank supply outlet. Pilots can prevent inadvertent uncovering of the tank outlet by having sufficient fuel in the tank selected and avoiding maneuvers such as prolonged uncoordinated flight or sideslips which move fuel away from the feed lines.

1.8.6 UNUSABLE FUEL

The manufacturer maintained that the aircraft was capable of using all but 1.5 US gallons (5.7 L) of its total fuel under reasonable flight conditions.

The manufacturer also indicated that the unusable fuel quantity increased during uncoordinated flight and sideslips that resulted in the turn and bank 'ball' moving more than ¼ ball out of centre and which occurred for more than 30 seconds.

While the chances of an asymmetric fuel situation causing a problem is low, pilots are reminded that as well as monitoring fuel usage, they need to be alerted to the potential for increased unusable fuel quantities in certain circumstances and the particular risks associated with operations at minimal fuel.

At the crash site less than 02 liters of fuel was found in the tank. Also, the fuel strainer assembly installed at the firewall was found broken due impact.

1.8.7 EXERCISE OF PRIVILEGES OF PILOT & CO-PILOT INVOLVED IN ACCIDENT

As per AIC 19 of 1985, no pilot-in-command or a co-pilot of an aircraft involved in an accident which required to be notified under Rule 68 (1) of the Aircraft Rules, 1937, shall exercise or be allowed by the aircraft operator/owner to exercise, the privileges of his pilot's Licence without specific authorisation in this behalf from the Director General of Civil Aviation. However, the co-pilot continued to impart Flying training after the accident.

The Rule 68 (1) of the Aircraft Rules, 1937 was superseded by Aircraft (Investigation of Accidents and Incidents), Rules 2012.

1.8.8 MINIMUM AIRCRAFT FUEL REQUIREMENT FOR GENERAL AVIATION AIRCRAFT.

1) For general aviation aircraft , ICAO Annex 6 Part II, section 2.2.3.6 "Fuel and oil supply" minimum fuel required is as under:

- For IFR, enough fuel to reach destination, then alternate (if required), plus 45 minutes
- For day VFR, enough fuel to reach destination plus 30 minutes
- For night VFR, enough fuel to reach destination plus 45 minutes

2) As per DGCA CAR Section 8 Series O Part III dated 6th January 2011 , Para 2.2.3.6 "Fuel & Oil Requirement"

- when the flight is conducted in accordance with the visual flight rules by day, flight to the aerodrome of intended landing, and after that, for at least 30 minutes at normal cruising altitude; or
- when the flight is conducted in accordance with the visual flight rules by night, flight to the aerodrome of intended landing and thereafter for at least 45 minutes at normal cruising altitude.

1.8.9 AIRCRAFT FUEL CONSUMPTION:

As per Lycoming O-235 Operators manual the Fuel consumption per hour is as under.

S. No.	Operation	RPM	Fuel Consumption Gal/Hr	Fuel Consumption Ltr/Hr
1.	Normal Rated	2800	9.5	35.9
2	Performance Cruise	2500	6.7	25.36
3	Economy Cruise	2400	5.8	21.9

As per Pilot statement, he didn't move mixture control from rich to lean power setting during the flight to save fuel.

1.8.10 MINIMUM FUEL REQUIRED FOR RANCHI- FURSATGANJ FLIGHT.

The minimum fuel required for the Ranchi- Fursatganj flight was calculated and is as under:-

1. Taxi Fuel= 5 ltr
2. Fuel for Flight 04 hr 35 min x 25.3 ltr/hr = 116 ltr
3. Fuel for reserve 30 min = 12.5 ltr

Minimum Fuel required for flight = 134 liters

1.8.11 FLYING CARRIED OUT BY VT-CAX DURING LAST 1 YEAR

S. NO.	DATE	HOURS	SECTOR
1.	20-03-2014	04:35 Hrs*	Ranchi- Fursatganj Airfield
2.	22-02-2014	01:05 Hrs	Jamshedpur-Ranchi
3.	12-02-2014	01:35 Hrs	Behela Aerodrome- Jamshedpur
4.	26-01-2014	00:20 Hrs	Local flying at Behela Aerodrome
5.	31-12-2013	00:50 Hrs	Local flying at Behela Aerodrome
6.	16-12-2013	00:45 Hrs	Local flying at Behela Aerodrome
7.	17-11-2013	00:25 Hrs	Local flying at Behela Aerodrome
8.	01-11-2013	00:05 Hrs	Local flying at Behela Aerodrome

9.	29-10-2013	00:10 Hrs	Local flying at Behela Aerodrome
10.	27-10-2013	01:00 Hrs	Local flying at Behela Aerodrome
11.	02-10-2013	00:20 Hrs	Local flying at Behela Aerodrome
12.	28-09-2013	00:25 Hrs	Local flying at Behela Aerodrome
13.	30-08-2013	00:30 Hrs	Local flying at Behela Aerodrome
14.	02-08-2013	00:50 Hrs	Local flying at Behela Aerodrome
15.	03-07-2013	00:15 Hrs	Local flying at Behela Aerodrome
16.	05-06-2013	00:20 Hrs	Local flying at Behela Aerodrome
17.	05-05-2013	00:20 Hrs	Local flying at Behela Aerodrome
18.	09-04-2013	00:20 Hrs	Local flying at Behela Aerodrome
TOTAL		**09:35 Hrs**	

**Not added in total.*

1.19 **Useful or effective investigation techniques*:*** NIL

2. ANALYSIS

2.1 SERVICEABILITY OF THE AIRCRAFT

The Cessna 152 aircraft VT-CAX was manufactured by M/s Cessna Aircraft Company. USA in 1980. The aircraft was issued with Indian Certificate of Registration (C of R) no.3954/4 which was valid till 05-07-2014 under category 'A' in the name of Transbharat Aviation Pvt Ltd. The owner of aircraft was M/s Chetak Aviation Pvt. Ltd., Aligarh. It also held valid Indian certificate of Airworthiness no. 6063, which was valid till 21-03-2014 i.e. one day after the accident. The aircraft had done 6473:00 airframe hrs since new and 03:00 hrs since the renewal of last C of A. The engine had done 1577:30 hrs since last overhaul and 10397:30 hrs since new. The aircraft held valid certificate of release to service (CRS) which was issued on 20-03-2014 at Ranchi. The last major inspection schedule on the aircraft was 200hrs/ 1 yrs, was carried out on 10-02-2014 at Behala, Kolkata. There was no snag recorded on the a/c after renewal of C of A. All the mandatory modifications/SB were found to be complied with.

On the day of the accident the Daily Inspection on the aircraft was carried out on the aircraft by the AME and no refueling was carried out at Ranchi. The aircraft took off for Fursatganj Airfield, Raibarely along with Co-pilot at 0336 UTC. The aircraft was flying at 4500 feet with 08-10 knots head wind enroute. At around 6 Nm from the Fursatganj Airfield the aircraft engine shut down. Pilot tried to restart the engine but engine didn't start. Pilot declared MAY DAY and carried out forced landing in a paddy field at around 0811 UTC. Aircraft rolled around 100 meters and hit a mud-bund which resulted in toppling of aircraft on nose. There was no fire and both the pilots escaped without injury. The aircraft was substantially damaged. Total duration of flight was 04 hrs 35 minutes. During flight Left fuel quantity gauge was showing correct reading but right fuel quantity gage was not showing correct reading.

Examination of the wreckage revealed that it was confined around the place of impact indicating that there was no in-flight disintegration of any part of the aircraft. Damage to one blade of propeller indicates that at the time of impact, the propeller was not rotating. The engine was strip examined at the DGCA approved overhaul shop and it was found that engine was running and delivering full power before stopping due fuel starvation. The damages observed on engine are due the result of the forced landing in the paddy field. Fuel & Oil consumption records were not properly maintained by the operator as per requirement in CAR.

2.2 WEATHER :

The visibility at time of takeoff from Ranchi was 4 Km and pilot requested flight under special VFR flight. Enroute weather was fine with 05-10 knots of headwind.

2.3 FUEL MANAGEMENT

As per Tech log the aircraft took-off from Jamshedpur on 22-02-2014, fuel in tank was 125 ltrs (100 + 25 ltrs refueling) and at time of Take-off from Ranchi fuel was also mentioned as 125 ltrs. No fueling was carried out at Ranchi Airport and there is no fuel consumption mentioned in Jamshedpur – Ranchi Flight. As per Section 2 of AFM note, due to cross-feeding between fuel tanks, the tanks should be re-topped after each refueling to ensure maximum capacity. The fuel before flight was checked using Dip stick.

Even though as per Tech log and PIC statement the fuel in the aircraft is 125 lts (60 +65), but probably the actual fuel was less in the tanks at Ranchi.

2.4 SUPERVISION BY M/S TRANSBHARAT AVIATION PVT. LTD.

M/s Transbharat Aviation (P) ltd started a Flying Training Organization (FTO) at Behala, Kolkata having DGCA approval vide AV 22011/2/2009-TRG. dated 26-09-2013 which was valid for a period of one year having three Cessna 152. Two aircraft VT- CHA & VT- CAX were taken on lease from M/s Chetak Aviation, Aligarh and were returning back to Aligarh from Ranchi on 20-03-2014. The aircraft VT- CAX was ferried from Aligarh to Behala Aerodrome on 21-08-2012.However, the aircraft was flown by many pilots at Behala Aerodrome before the FTO approval granted to M/s Transbharat Aviation Pvt. Ltd by DGCA.

As per records &Tech log, total flying carried out on VT- CAX from 26-09- 2013 till date of accident was 03:00 hrs. Various pilots flew the aircraft VT-CAX including the involved pilot & copilot (Pilot instructor with other flying club). The aircraft VT- CAX flew Behala- Jamshedpur on 12-02-2014, Jamshedpur- Ranchi on 22-02-2014 and Ranchi-Fursatganj on 20-03-2014 i.e. one day before the expiry of C of A & ARC.

VT- CHA aircraft which flew along with VT-CAX was also piloted by Pilot Instructor of M/s Alchemist Flying Academy, Jamshedpur.

2.5 CO-PILOT HANDLING THE AIRCRAFT.

The co-pilot was working as Pilot Instructor to M/s Alchemist Flying Academy, Jamshedpur on date of accident. The flight plan filing and landing / parking clearance at Ranchi was carried out by the co-pilot. During the accident flight, RT communications was handled by the co-pilot.

Review of co-pilot log book reveals that there was no entry made in the Pilot log book and Tech Log regarding the accident flight carried on 20-03-2014. Also, the log book was

certified for the month of March 2014 by Chief Flying Instructor of M/s Alchemist Flying Academy, Jamshedpur.

The Pilot Instructor had earlier flown solo VT- CAX from Behala Aerodrome, West Bengal to Jamshedpur on 12-02-2014 for duration 01:35 Hrs. After the accident, the co-pilot carried out Pilot Instructor duty without any corrective training. This is violation of AIC 19 of 1985.

2.6 PILOT HANDLING OF THE AIRCRAFT:

The PIC was a freelance pilot authorized by M/s Transbharat to carryout flight Ranchi to Fursatganj Airfield, Raibarely on 20-03-2014. Earlier on 22-02-2014, VT- CAX was flown from Jamshedpur to Ranchi by involved PIC & Transbharat Pilot as co-pilot. The PIC carried preflight inspection and accepted the aircraft for flight. No refueling was carried out at Ranchi. The Fuel at Takeoff from Jamshedpur & Ranchi was mentioned as 125 ltrs, even though there was no refueling carried at Ranchi. The enroute flight was uneventful. At around 6 Nm from the Fursatganj Airfield while on approach to the final destination aircraft engine shut down. PIC tried to restart the engine but engine didn't start. PIC communicated MAY DAY call (3 times) to Fursatganj Airfield ATC and carried out forced landing in a paddy field. Aircraft rolled about 100 meters before hitting a mud -bund and toppled. There was no injury to both the occupants. During flight the PIC had not put the mixture control to lean position from rich position to save fuel. The total duration of flight was 04 hrs 35 minutes.

At the time of take-off at Ranchi, the aircraft was overloaded by 43 Kg.

2.7 CIRCUMSTANCES LEADING TO THE ACCIDENT:

The aircraft was cleared for take-off by ATC Ranchi at around 0336 UTC to fly to Fursatganj Airfield, Raibarely along with Co-pilot. The Pilot in Command (PIC) is a freelance pilot authorized by Transbharat & Co-pilot was Pilot Instructor of M/s Alchemist Aviation Pvt. Ltd. As per pilot statement, there was 125 ltrs. of fuel available on the aircraft and endurance of aircraft was 06 Hrs. Another Cessna152 aircraft VT- CHA which was also to be returned to owner i.e. M/s Chetak Aviation, Aligarh took off after 04 minutes for Fursatganj Airfield, Raibarely along with VT-CAX. Enroute the aircraft VT-CAX was flying at 4500 feet with 05-10 knots head wind. Around 45 Nm inbound ATC Varanasi, instructed VT-CAX to make 25 DME arc due traffic and then set course for Fursatganj Airfield. After passing Varanasi, the pilot of VT- CAX contacted Fursatganj ATC around 42 NM from Airfield. Fursatganj ATC allowed aircraft to Descend to 3500 feet & further to 2100 feet. At around 6 Nm from the Fursatganj Airfield the aircraft engine shut down. Pilot tried to restart the engine but engine didn't start. Pilot communicated MAY DAY call (3 times) to Fursatganj ATC at 0807 UTC and carried out forced landing in a paddy field at around 0811 UTC at Radial 120 from Fursatganj airfield. Aircraft rolled about 100 meters before hitting a mud -bund and toppled. There was no fire and both the pilots escaped

without injury. The aircraft was substantially damaged. Total duration of flight was 04 hrs 35 minutes.

The aircraft carried out previous flight on 22-02-2014 Jamshedpur- Ranchi and parked till 20-03-2014.No refueling was carried out at Ranchi & actual fuel in the tanks at the time of take -off from Ranchi was less than mentioned in the Tech log. Also, aircraft was overloaded by 43 Kg at the time of take-off at Ranchi.

3. CONCLUSIONS:

3.1 FINDINGS:

1. The aircraft held valid certificate of Airworthiness which was valid till 21-03-2014, i.e. one day after the accident.
2. PIC was a freelance pilot authorized by M/s Transbharat to carryout flight & co-pilot was working as Pilot instructor at M/s Alchemist Flying Academy, Jamshedpur.
3. AME carried out preflight inspection at Ranchi before flight and aircraft was accepted by the Pilot. The aircraft was serviceable and no abnormality was reported by the pilot before under taking the flight.
4. PIC & Copilot of M/s Transbharat had carried out previous flight on 22-02-2014 Jamshedpur- Ranchi and aircraft was parked at Ranchi till accident flight.
5. As per Tech log, at the time of Take-off from Ranchi fuel in the tank was as 125 ltrs. However at Take-off from Jamshedpur on 22-02-2014, fuel in tank was mentioned as 125 ltrs (100 + 25 ltrs refueling). Since no fueling was carried out at Ranchi Airport, actual fuel in the tanks at the time of take-off from Ranchi was less than mentioned in the Tech log.
6. The aircraft took-off at Ranchi at 0336 UTC for Fursatganj Airfield, Raibarely along with Co-pilot. Enroute the aircraft was flying at 4500 feet with 05-10 knots head wind. Around 45 Nm inbound ATC Varanasi, instructed VT-CAX to make 25 DME arc due traffic and then set course for Fursatganj Airfield. After passing Varanasi, the pilot of VT- CAX contacted Fursatganj ATC around 42 NM from Airfield. Fursatganj ATC allowed aircraft to Descend to 3500 feet & further to 2100 feet. The enroute flight from Ranchi till descend to Fursatganj Airfield was uneventful.
7. At around 6 Nm from the Fursatganj Airfield, while on approach aircraft engine shut down. Pilot tried to restart the engine but engine didn't start.
8. Pilot communicated MAY DAY call (3 times) to Fursatganj ATC and carried out forced landing in a paddy field.
9. The aircraft landed in a paddy field & rolled about 100 meters before hitting a mud -bund and toppled.
10. There was no fire and both the pilots escaped without injury. The aircraft was substantially damaged.
11. The total duration of flight was 04 hrs and 35 minutes.

12. Aircraft was overloaded by 43 Kg at the time of take-off at Ranchi. During flight the PIC didn't put the mixture control to Lean position from Rich position to save fuel.
13. The engine was strip examined at the DGCA approved overhaul shop and it was found that engine was running and delivering full power before fuel starvation. The damages observed on engine are due the result of the forced landing in the paddy field
14. Fuel & Oil consumption records were not properly maintained by the Operator as required in CAR. Also, as per Section 2 of AFM note, due to cross-feeding between fuel tanks, the tanks should be re-topped after each refueling to ensure maximum capacity.
15. After the accident, the co-pilot carried out Pilot Instructor duty without any corrective training. This is violation of AIC 19 of 1985
16. The aircraft VT- CAX was ferried from Aligarh to Behala Aerodrome on 21-08-2012.However, the aircraft was flown by many pilots at Behala Aerodrome before the FTO approval granted to M/s Transbharat Aviation Pvt. Ltd on 26-09-2013.

3.2 PROBABLE CAUSE OF THE ACCIDENT:

The Committee of inquiry determined the probable cause of accident as "Improper fuel planning resulted in fuel starvation and loss of engine power which caused forced landing of aircraft in a paddy field".

Contributory factor

Lack of Supervision by M/s Transbharat Aviation and ferry flight by pilots who were pre occupied with other duties.

4. SAFETY RECOMMENDATIONS:

1. DGCA may take necessary action on the basis of findings in the report.

2. DGCA should ensure during Surveillance inspection of Flying Clubs regarding proper records of log book entries and Aircraft Fuel Consumptions.

3. DGCA should make a proper procedure for cross utilization of pilot instructor.

Shilpy Satiya 11/3/16

(Shilpy Satiya)
Air Safety Officer (E), AAIB
Member, COI – VT- CAX

Amit Gupta 11/3/2016

(Amit Gupta)
Director (AED),
O/o Dy. DGCA, Bengaluru-17.
Chairman, COI – VT- CAX

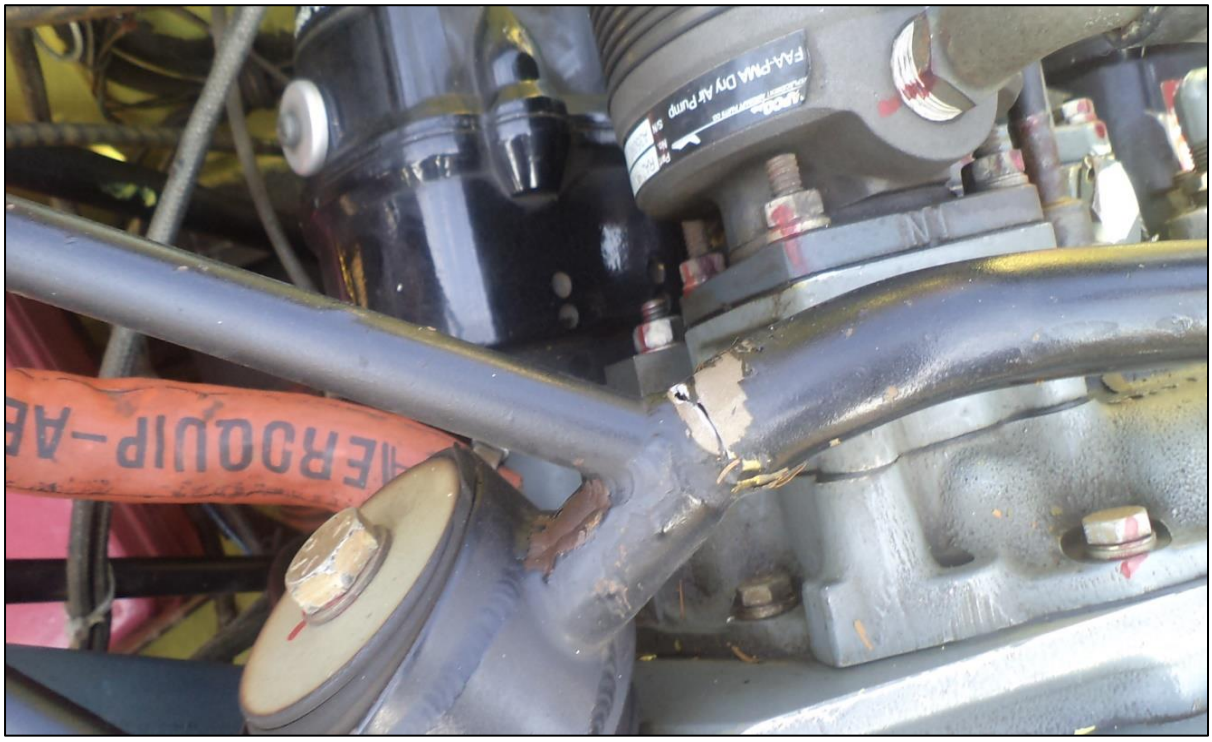
Date: 11th March 2016
Place: New Delhi

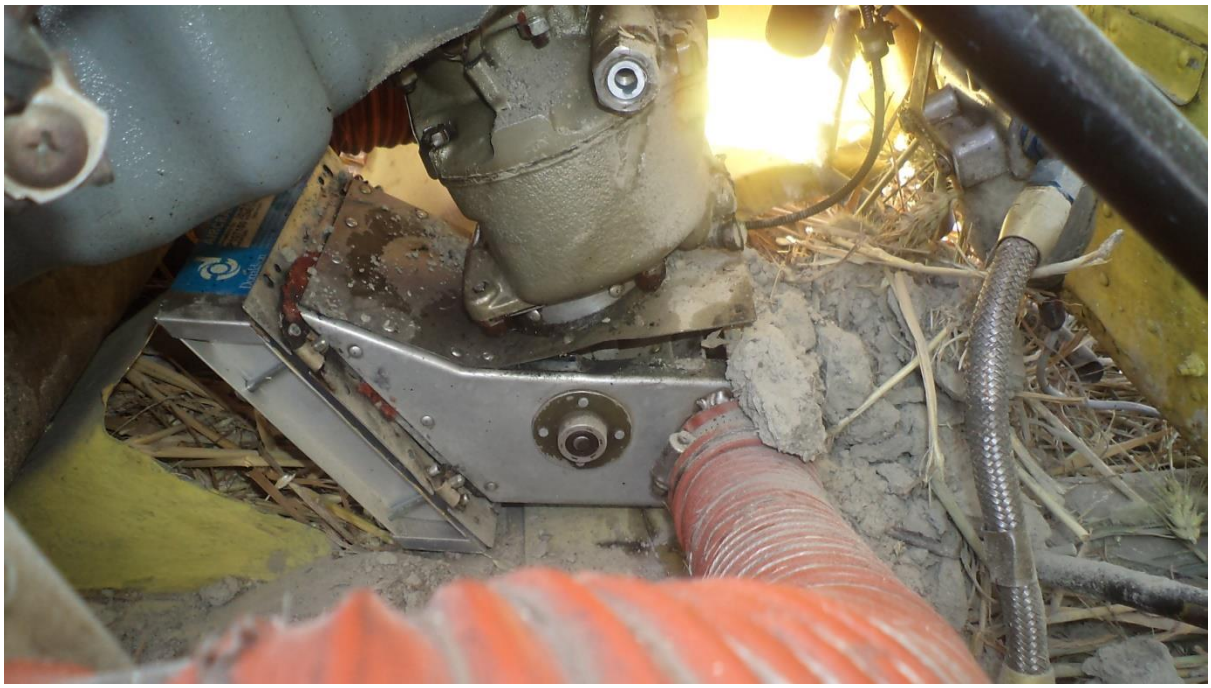
APPENDICES

GROUND MARKS & TOPPLING OF AIRCRAFT ON NOSE

DAMAGE TO PROPELLER

DAMAGE TO NOSE LANDING GEAR





DAMAGES TO ENGINE & ENGINE MOUNT

POSITION OF THROTTLE, MIXTURE CONTROL, FLAP LEVER & FUEL COCK