FINAL INVESTIGATION REPORT ON FATAL ACCIDENT TO M/S M.P FLYING CLUB CESSSNA 152 AIRCRAFT VT-EUE AT INDORE ON 19/11/2014

COMMITTEE OF INQUIRY VT-EUE

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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
AFIR	Assistant Flight Instructor Rating
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
CFI	Chief Flight Instructor
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 per Hour
NDB	Non-Directional Beacon
Nm	Nautical Miles
NSOP	Non-Scheduled Operating Permit
PI	Pilot Instructor
PIC	Pilot in Command
Qtz/hr	Quartz per Hour
RPM	Rotation per minute
RT	Radio- Telephony
RTR	Radio- Telephony Restricted
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Range
USA	United States of America
UTC	Coordinated Universal Time

FINAL INVESTIGATION REPORT ON FATAL ACCIDENT TO M/S M.P FLYING CLUB CESSSNA 152 AIRCRAFT VT-EUE AT INDORE ON 19/11/2014			
1.	Aircraft	Type	Cessna - 152
		Nationality	Indian
		Registration	VT-EUE
2.	Owner & Operator		Madhya Pradesh Flying Club, Indore
3.	Pilot		CPL
	Extent of Injuries		Fatal
4.	Other Pilot		CPL
	Extent of Injuries		Serious
5.	No. of Passengers on board		Nil
6.	Date & Time of Accident		19.11.2014; 0527 UTC
7.	Place of Accident		Devi Ahilyabai Holkar Airport, Indore
8.	Last point of Departure		Devi Ahilyabai Holkar Airport, Indore
9.	Intended landing place		Devi Ahilyabai Holkar Airport, Indore
10.	Type of Operation		Training Flight
11.	Phase of operation		During Climb
12.	Type of accident		Crash Landing
13.	Co-ordinates of Accident Site, AMSL		22°43'22" N, 75°48'23.4" E 1840 Ft.

(ALL TIMINGS IN THE REPORT ARE IN UTC)

SYNOPSIS

On 19.11.2014 Cessna 152 aircraft was involved in an accident at 0527 UTC at Indore Airport while carrying out simulated engine failure exercise. There were two pilots on board

The pilot Instructor (PI) of M/s MPFC from ground was monitoring the flying activities. During supervision of flying it was noticed by the pilot Instructor (PI) on ground that Cessna 152 aircraft was flying too low in the right downwind of Rwy 25. The pilot Instructor (PI) of M/s MPFC tried to contact the aircraft VT-EUE on RT (122.8) to advise “stop flying” through another aircraft VT-ACT which was parked on the MPFC apron. However the contact could not be established with the aircraft. Therefore he requested ATC Indore to communicate and advise the aircraft to make full stop landing. However ATC also failed to establish contact with the aircraft.

Since none of the pilots on board of the aircraft were responding the ATC Indore sent operational vehicle towards Rwy 25 end to establish visual contact. Efforts were also made to contact the crew on their mobiles but none of them was picking up the call. After making few attempts other Pilot took the call and was screaming badly. After approx 13 minutes at 0540 UTC Search and Rescue vehicle located the aircraft and it was found that the aircraft had crash-landed between isolation bay and localizer left of runway 25 end. ATC (Air Traffic Controller) Indore sent rescue team along with CFTs (Crash Fire Tenders), ambulance to the crash site and both the occupants(Pilot and other Pilot) were rescued from the crashed aircraft. They were taken to Arbindo Hospital Indore for treatment. Both the occupants (Pilot and Other Pilot) received serious injuries. Later Pilot succumbed to his injuries. There was no fire after the accident.

The Ministry of Civil Aviation constituted a committee of inquiry to investigate into the cause of the accident under Rule 11 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2012 comprising of Sh. Raje Bhatnagar, Assistant Director as Chairman and Ms. Shilpy Satiya, Air Safety Officer as member vide order No. AV.15018/80/2015-DG.

The probable cause of accident is “The aircraft stalled, impacted the ground and nose rolled over due to erroneous steep left turn by pilot while practicing simulated engine failure, with throttle in idle position”.

1. FACTUAL INFORMATION.

1.1 History of the flight

On 19.11.2014 Cessna 152 aircraft was involved in an accident at Indore while the Pilot was flying for the purpose of accumulating hours for issue of Assistant Flight Instructor Rating. While flying Pilot was carrying out simulated engine failure exercise, which though is not a mandatory requirement for accumulation of 100 hrs. The Pilot was a CPL holder. There was also an unauthorized occupant who was an Assistant Pilot Instructor. Pilot made an entry in the Journey Log Book (JLB) on the morning of 19.11.2014 to continue his flying. He was flying under the privileges of his CPL and had signed a bond with MPFC to render his services to MPFC after he qualifies his AFIR.

PI was authorized by the CFI to monitor the flying activities as CFI proceeded on cross-country flight. However the accidental flight was authorized by CFI.

Daily inspection was carried out by the AME before the flight and nothing abnormal was observed. Fuel quantity was also checked in both the tanks and it was 45 liters in each tank. The aircraft was released to service at 0200 UTC for 0600 Hrs. of flying.

Pilot Instructor (PI) on ground was not aware that one API i.e. other Pilot is also accompanying the Pilot on the aircraft and neither any entry was made in the Journey Log book.

Aircraft departed at 0509 UTC for simulated engine failure exercise from runway 25. The weather at the time of takeoff was fine visibility 5000 m haze and winds 50/05 kts. At 0518 UTC before first touch and go, the Pilot was maintaining listening watch. At time 0519 UTC first touch and go circuit was done and at 0524 UTC second touch and go was carried by the aircraft.

After the second circuit the aircraft was refueled and walk around inspection was carried out by AME. No abnormality was observed during inspection and again the aircraft was released for next sortie.

Aircraft took off from the rwy 25 end at 0524 UTC for third simulated engine failure exercise and thereafter ATC lost visual contact with aircraft.

As per the statement of other Pilot:-

a) Before takeoff Pilot informed other Pilot that he will be practicing simulated emergency exercises. During first circuit of the third sortie of the day Pilot tried

to practice downwind simulated emergency and glided back to runway 25. Thereafter again took off for second circuit and again practiced downwind simulated emergency and glided back to runway 25. During third circuit of the third sortie of the day Pilot tried to simulate “engine failure after takeoff” at around 2150 ft. MSL. However instead of landing ahead on the runway as per SOP Pilot tried to come back on runway 25 by taking a steep left turn.

b) Flap were not up at this time and Other Pilot shouted to Pilot to recover the aircraft but in return other Pilot did not get any response from the Pilot. Immediately other Pilot took over the controls and tried to level up the aircraft and also opened up the power.

c) Other Pilot mentioned that aircraft kept on sinking.

As per the statement of PI on ground during supervision of the flight it was noticed that Cessna 152 aircraft was flying too low in the right downwind of Rwy 25. PI therefore tried to contact the aircraft VT-EUE on RT (122.8) to advise “stop flying” through one of the aircraft (VT-ACT) which was parked on the MPFC apron at 0526 UTC. As PI was not able to establish contact with the aircraft. He requested ATC Indore to communicate and advise the aircraft to make full stop landing. ATC also failed to establish contact with the aircraft.

Since none of the pilots from Cessna 152 aircraft were responding, PI on ground advised ATC to send operational vehicle towards Rwy 25 end to establish visual contacts. Efforts were also made to contact the crew on their mobiles but none of them was picking up the call. After making few attempts, Other Pilot took the call and was heard badly screaming over phone. The aircraft was located at 0540 UTC. The aircraft was found crashed and toppled between isolation bay and localizer towards left of runway25 end. Both the pilots were rescued from the crashed aircraft and were taken to the Arbindo Hospital Indore for treatment. Pilot and Other Pilot received serious injuries. Pilot succumbed to his injuries. There was no fire after the accident.

Aircraft’s ELT activation was detected by ‘INSAT 04’ at 0527 UTC which was brought to the knowledge of Flying Club personnel by INMCC, ISTRAC.

1.2 Injuries to persons.

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	01	Nil	Nil
SERIOUS	Nil	Nil	01
MINOR/ None	Nil	Nil	----

1.3 Damage to aircraft.

The aircraft sustained substantial damage and was beyond repair. Following are the damages:-

1. Engine mounts to Nose Landing Gear all connecting Tubes of Engine Mount broken.
2. NLG fork and wheel separated along with inner Cylinder of shock strut.
3. Prop mount flange bent & engine starter mount broken.
4. Alternator fan bent.
5. Main engine baffle at bottom crushed.
6. Cylinder no. 2 & 3 Exhaust riser crushed and Cylinder no. 1 & 4 riser minor damage.
7. Exhaust muffler completely crushed.
8. Fuel primer line at Cyl. No. 1 found crushed.
9. Oil cooler damaged.
10. Carburetor supply line broken at strainer and carburetor found broken from oil sump mounting. The carburetor throttle butterfly valve and control linkage found broken.
11. Cylinder No-3-induction riser detached and cylinder no-2 riser bent.
12. Hit mark on lower/ rear of oil sump.
13. Induction air box assy. Along with Induction Filter Separated.
14. Firewall ruptured at center and crushed all over.
15. Transponder near rear fuselage.
16. R.H wing crushed at leading edge wing tip.
17. Bottom surface of R.H. wing near strut area damaged.
18. L.H wing complete bottom surface wrinkled and leading edge crushed.
19. All flight control surfaces wrinkled and damaged.
20. Center fuselage badly crushed and found damaged.

21. Both door in opened condition while L.H door side was cut opened to rescue the crew.
22. L.H wheel along with axle Detached from MLG and away from aircraft.
23. Rear of the fuselage crushed.
24. ADF sense antenna attached wire detached.
25. Beacon light detached.
26. Nose wheel under L.H. wing.
27. L.H. tire burst.
28. Oil filter adapter from mount at Accessory gear Section broken and detached.
29. Breather line broken and detached.
30. R.H magneto no (1) and (3) leads broken at magneto.
31. Oil Drain Tube from cylinder no.3 detached.

1.4 **Other damage: Nil**

1.5 Personnel information:

1.5.1 Pilot:

AGE	: 28 YRS 11 MONTHS AND 12 DAYS
Licence	: CPL
Date of Issue	: 21 JANUARY 2011
Valid up to	: 20 JANUARY 2016
Category	: AEROPLANE
Class	: SINGLE/MULTI ENGINE LAND
Endorsements as PIC	: CEESNA 152, CESSNA 172, P68C
Date of Med. Exam.	: 16/04/2014
Med. Exam valid upto	: 15/04/2015
FRTO Licence No.	: VALID
Date of issue	: 21/01/2011
Valid up to	: 20/01/2016
Total flying experience	: 377:40 Hrs.
Experience on type	: 310:20 Hrs
Experience as PIC on type	: 276:35 Hrs.
Last flown on type	: 19/11/2014

Total flying experience during last 180 days	:	109:20 Hrs.
Total flying experience during last 90 days	:	69:45 Hrs.
Total flying experience during last 30 days	:	35:05 Hrs.
Total flying experience during last 07 Days	:	4:45 Hrs.
Total flying experience during last 24 Hours	:	1:15 Hrs.

1.5.2 Other-Pilot:

AGE	:	25 YEARS 5 MONTHS AND 7 DAYS
Licence	:	CPL
Date of Issue	:	10/08/2011
Valid up to	:	09/08/2016
Category	:	AEROPLANES
Class	:	SINGLE ENGINE LAND
Endorsements as PIC	:	CESSNA 152, CESSNA 172R
Date of Med. Exam.	:	26/09/2014
Med. Exam valid upto	:	25/09/2015
FRTO Licence No.	:	VALID
Date of issue	:	10/08/2011
Valid up to	:	09/08/2016
Total flying experience	:	1055:35 Hrs..
Experience on type	:	686:15 Hrs
Experience as PIC on type	:	629:00 Hrs
Last flown on type	:	19/11/2014
Total flying experience during last 180 days	:	179:20 Hrs.
Total flying experience during last 90 days	:	99:30 Hrs.
Total flying experience during last 30 days	:	43:45 Hrs.
Total flying experience during last 07 Days	:	11:00 Hrs.
Total flying experience during last 24 Hours	:	6:25 Hrs.

1.6 Aircraft information:

1.6.1 General description:

Cessna 152 aircraft was manufactured by M/s Cessna Aircraft Company USA in 1978.The aircraft is two-seater, fixed tricycle landing 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-N2C 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 108 BHP with engine speed of 2550 RPM. The aircraft is fitted with fixed pitch Sensenich Propeller of model No.72CKS6-0-54 with 2 blades. The aircraft is certified for a single pilot operation. There are two doors. The aircraft was fitted with Standard Range Tanks having a total fueling capacity of 26 U. S. gallon and usable fuel is 24.5 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 one 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 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 30 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.

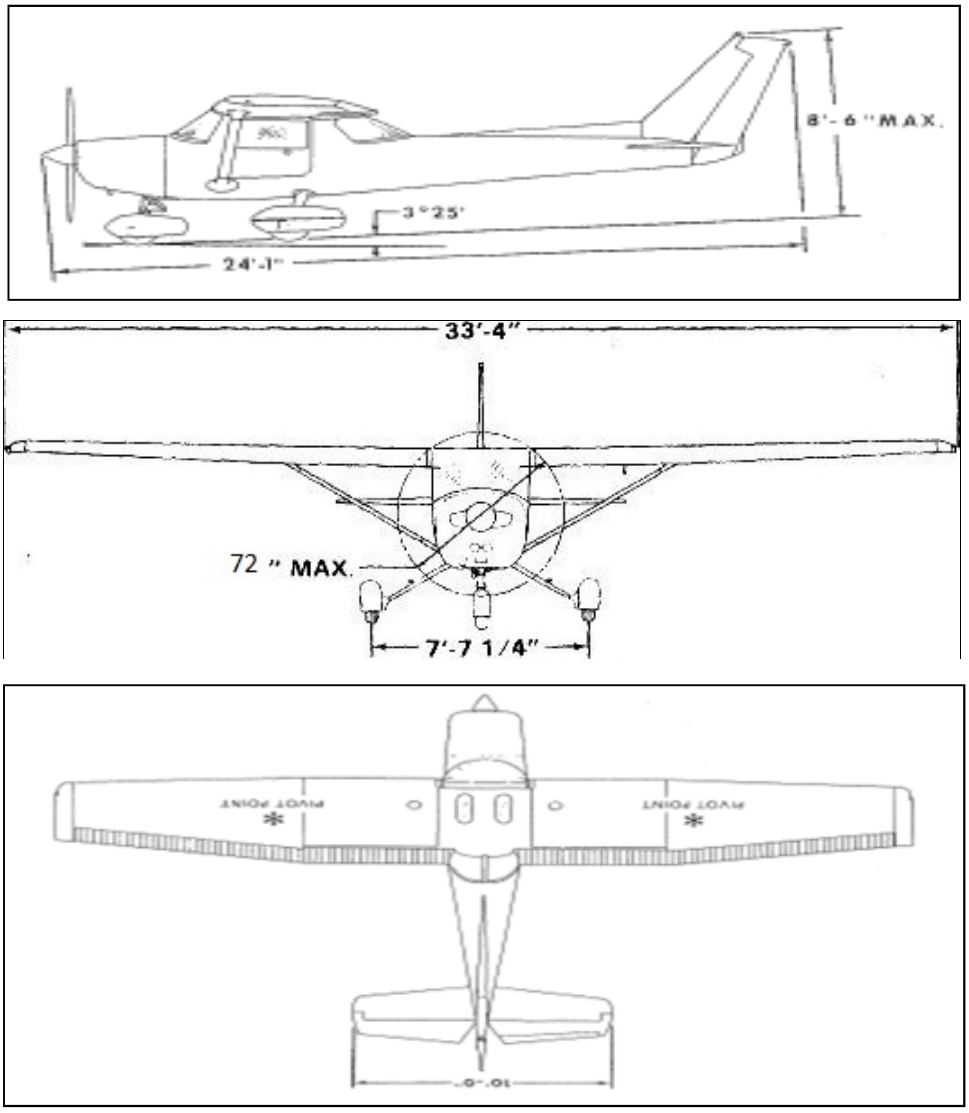

Fig: Three view drawing

1.6.2 Aircraft Technical Information

Aircraft		
1.	Manufacturer	Cessna Aircraft Company Wichita Kansas, USA
2.	Type	Cessna 152
3.	Aircraft Registration	VT-EUE
4.	Constructor Sl. No.	15279927
5.	Year of Manufacturer	1978
6.	Certificate of Registration No.	2583/3
7.	Certificate of Airworthiness No.	2071
8.	C of A renewed on	30.01.2014
9.	C of A valid up to	29.01.2015
10.	ARC issued on	29.01.2014
11.	ARC valid up to	29.01.2015
12.	Category of C of A	Normal
13.	Subdivision category of C of A	Passenger
14.	Minimum Crew	01
15.	Aircraft Empty weight	561.73 Kgs.
16.	Maximum All up weight	760.00 Kgs.
17.	Date of aircraft weighment	02.07.2013 Hyderabad
18.	Last major Inspection	200 Hrs./01 Year
19.	Last major Inspection carried out on	27.10.2014 at 22562:30 Hrs.
20.	Airframe hours Since New	22622:05
21.	Airframe Hours since last C of A	751:55
22.	Aircraft usual station as per C of R	Indore
23.	Aeromobile License No.	A-190/8

Engine		
1.	Manufacturer	Textron Lycoming
2.	Type	Lycoming O-235N2C
3.	Sl No.	L-18597-15
4.	Engine hours Since New	7503:50

5.	Engine hours Since O/H	934:20
6.	Date of O/H	28.06.2013
7.	Last major Inspection	200 Hrs./01 Year carried out at 874:45 Hrs.
8.	Last major Inspection carried out on	27.10.2014
9.	Average Fuel consumption as per fuel oil register	Approximate 19.22 Lts./hr.
10.	Average Oil consumption as per fuel oil register	Approximate 0.040 Qtz/hr.

Propeller		
1.	Manufacturer	SENSENICH
2.	Type	72CK-6-O-54
3.	Sl No.	K9960
4.	Last major Inspection	200 Hrs./01 Year
5.	Last Major Inspection Carried out	874:45 Hrs. on 27.10.2014
6.	Total hours Since Overhaul	934:20 Hrs.

Scrutiny of the Tech log revealed that there was no defect reported on the aircraft before the accident flight. The defect register shows no defect since last major inspection.

Last entry in Fuel & Oil consumption register was found of dated 18.11.2014. The entry for fuel uplifted on 19.11.2014 was to be made at the end of day. However fuel slip for 40 ltrs of fuel uplift was available.

AUW of the aircraft and C.G. was within limit at the time of take-off.

1.7 Meteorological information:

The following is the Met report on the date of accident between 0430 UTC to 0530 UTC. The accident occurred at around 0527 UTC.

Time (UTC)	Wind Direction	Speed	Visibility (meter)	Temp (ºC)	QNH
0430	Calm		3000	26	1021
0500	050	05	5000	27	1020
0530	080	03	5000	28	1020

1.8 Aids to navigation:

Cessna Aircraft :-

ADF, VOR, ATC Transponder, ELT, HF

Aerodrome Aids:-

Navigation and Landing Aids

PAPI, DVOR, DME, NDB and ILS systems are available.

1.9 Communications:

There was always two way communication between the ATC and the aircraft except for last few minutes just before accident.

1.10 Aerodrome information:

Devi Ahilyabai Holkar Airport, Indore

ICAO Code: VAID
Co-ordinates: 22°43'22" N, 75°48'23.4" E
Elevation : 1840 Ft

Runway Orientation and Dimension

Orientation- 07/25
Dimension-2287 x 45 meters
R/W & Taxi Tracks Markings Standard as per Annex- 14.

RWY.	ILS CAT	PAPI	SAPL	Runway Edge Lights	Runway Center line Lights
07	-	Yes	Simple Approach Light	Yes	No
25	CAT-I	Yes	Simple Approach Light	Yes	No

ATS Communication Facilities

ATIS : 127.6 MHz

Tower : 122.80 MHz PRIMARY

118.50 MHz SECONDARY

1.11 Flight recorders:

Neither fitted nor required as per Regulation.

1.12 Wreckage and impact information.

1.12.1 During examination of the wreckage at site, it was observed that the aircraft was inside airport premises between isolation bay and localizer towards rwy 25 end and approx. 100 meters from the boundary wall. The wreckage was confined to one place indicating that there was no in-flight disintegration of the aircraft.

1.12.2 It was observed that the aircraft hit the ground and dragged for about 25 m thereafter hit the mud- bund and toppled upside down. The propeller spinner got disintegrated after the impact. The propeller hub was found buried in ground, along with the propeller blades and the same was also disintegrated from the engine crankshaft. The nose wheel was found 80 meters behind the final resting position of aircraft. The main landing gear was damaged due to impact.

1.12.3. In the cockpit throttle levers were in forward position, the mixture was full rich and the flap lever was in full up position. Fuel shutoff valve was in ON position.

Final rest position of the aircraft

1.12.5. Firewall, engine and engine mount were found squeezed towards the cockpit and the skin was found to bulge out between firewall and the R.H.S. of door hinge. Complete cockpit, fuselage, and wing joints and were found broken due to impact.

Fuselage was also found bent longitudinally. Fuel spillage was found on ground. The cockpit had to be cut open from L.H.S with axe and iron bars to take the PILOT and Other Pilot out of the cockpit.

1.13 Medical and pathological Information:

After the accident, the PILOT succumbed to his injuries. Other Pilot sustained serious injuries and was discharged from hospital with the lower body paralysed.

1.14 Fire:

There was no Pre or Post impact fire.

1.15 Survival aspects:

The accident was not survivable. The grass in the airport area was very high which caused hindrance to locate the aircraft during search and rescue operation.

1.16 Tests and research:

1.16.1 Engine Strip Examination:

The involved engine of VT- EUE was transported to Delhi and strip examined at Delhi Flying Club in the presence of the committee member. Delhi Flying Club is a DGCA approved engine overhaul workshop for Lycoming O-235 engines. Following are the salient observations

i) Exhaust Damaged. No external oil leakage observed.

ii) No damage on cylinder fins. All cylinder base nuts found intact. Compression test of the cylinders carried out with Differential Pressure tester and found satisfactory.

iii) Propeller Flange Bent & Flange bushing sheared off.

iv) Magnetos ignition harness broken (RH). Magnetos tested and found working satisfactorily.

v) All spark plugs found satisfactory. No fouling observed.

vi) Push rods & rocker arm inspected and found satisfactory. Cold tappet clearance found under limits but at lower side.

vii) The dimensional checks of all parts were carried out and all dimensions were found within limits. No internal damage was observed after the Inspection of the engine.

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

1.17 Organizational and management information:

M/s Madhya Pradesh Flying Club Ltd. is a Flying Training Academy and also had a NSOP. The NSOP was not valid at the time of accident. The academy has presently fleet of seven aircrafts i.e. three Cessna 152, two Cessna 172R, one Baron B-58 & one observer P68C-TC. M/s Madhya Pradesh Flying Club is headed by its

Accountable Manager who looks after all the training activities of Flying Training Academy. The flying activities are headed by the Chief Flight Instructor. The and the engineering department is headed by Maintenance Manager. In addition to the CFI there were five Pilot Instructor and one Assistant Pilot Instructor (API) working with the organization. The M/s Madhya Pradesh Flying Club Ltd. has in house approved maintenance setup.

1.18 Additional Information:

1.18.1 Procedure followed by MPFC for flying training

Flight Instructor manual of Civil Aviation Safety Authority of Government of Australia was used as a guidance material.

As per Flight Instructor manual of Civil Aviation Safety Authority of Government of Australia, during ENGINE FAILURE AFTER TAKE-OFF

"Choice of landing area and height available must be considered together. The amount of turn should be restricted to the minimum dictated by obstacles ahead It must be stressed that the rate of descent and stalling speed will increase in any turn.

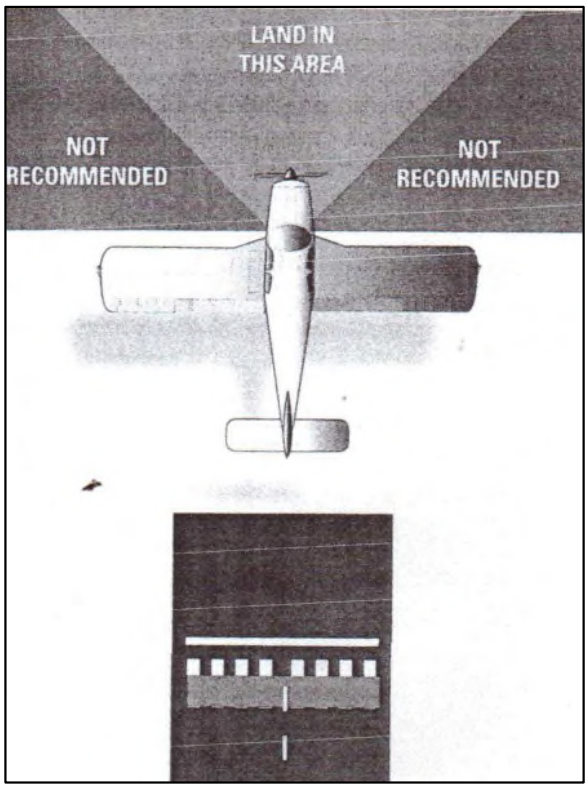

Figure shows the usual areas of intended landing in the case of engine failure after take-off.

1.18.2 Authorisation of Flight

Scrutiny of Authorization Book reveled that Blank Authorizations were signed by CFI without date and time on number of pages.

1.18.3 Maintenance of green areas outside Air Strips.

As per ICAO DOC 9137-AN/898 Part 9 Para 6.4.2 Maintenance of grass surfaces should be determined by the individual needs of the site, i.e. the local species of birds and their habits. Most species prefer low grass areas for food searching conditions for finding food are better and watching out for enemies is facilitated by good visibility in all directions. For keeping large numbers of birds from settling the optimum grass height has been observed to be around 20 cm.

1.19 Useful or effective investigation techniques: NIL

2. ANALYSIS

2.1 Serviceability of the aircraft:

The Cessna 152 aircraft was manufactured by M/s Cessna Aircraft Company. USA in 1978. The Aircraft had Certificate of Airworthiness Number 2071 under "Normal category" subdivision Passenger issued by DGCA and valid till 29.01.2015. The aircraft was issued with Indian Certificate of Registration (C of R) no. 2583/3 under category ‘A’ in the name of M/s M.P. Flying Club.

All the inspection schedules, SBs and mandatory modifications were complied with. The aircraft had valid certificate of release to service (CRS). There was no snag recorded on the a/c before the accident flight.

Daily inspection was carried out by the AME and nothing abnormal was observed. Fuel quantity was also checked in both the tank and found satisfactory. Thereafter the aircraft was released for flight by AME. After the accident strip examination of the engine was carried out at a DGCA approved facility and it was observed that engine was running and delivering normal power at the time of accident.

In view of the above it is inferred that Serviceability of the aircraft is not factor to accident.

2.2 Weather:

The weather reported at 0500 UTC at Indore Aerodrome was winds 05 kts and visibility 5000 meters. There was no unusual weather phenomenon reported by ATC prior to accident.

In view of the above, it is inferred that weather was not a contributory factor to the accident.

2.3. Supervision by M/s M.P. Flying Club

M/s M.P. Flying Club has a Flying Training Organization (FTO) at Indore and Bhopal in Madhya Pradesh state of India.

CFI had authorized the flying in the morning of 19.11.2014 and was on cross-country at the time of accident. However, it was observed that for the accidental flight type of exercise to be carried out was not mentioned in the authorization book.

Pilot was flying for the purpose of accumulating hours for issue of Assistant Flight Instructor Rating. While flying Pilot was carrying out simulated engine failure exercise, which is not a mandatory requirement for accumulation of 100 Hrs. He was flying under the privileges of his CPL and had signed a bond with MPFC to render his services to MPFC after he qualifies his AFIR.

PI supervised the flying activities of M/s MPFC in the absence of CFI. The PI on ground monitoring the flying activities was not aware that simulated engine failure exercise will be practiced by the Pilot. He was under the impression that Pilot has taken the flight for his hour building. He was also not aware that one more API had accompanied Pilot in the cockpit and has positioned himself on the seat of Co-Pilot.

Further the Blank Authorizations signed by CFI without date and time was not as per the laid down procedures.

Hence it is concluded that there was lack of supervision by CFI/PI in respect of flying activities of MPFC.

2.4 Pilot handling of the aircraft

Before takeoff, Pilot informed other Pilot that he would be practicing simulated emergencies. During first circuit, Pilot tried to practice downwind-simulated emergency and glided back to runway 25. Thereafter again took off for second circuit and again practiced downwind-simulated emergency and glided back to runway 25. During third circuit, Pilot tried to simulate “engine failure after takeoff emergency” at around 2150 ft. MSL. In contradictory to the stipulated procedure, Pilot tried to come back on runway 25 by taking a steep left turn. As the throttle lever was at idle, the aircraft started sinking due no forward thrust. Attempting steep left turn in these conditions made the aircraft to stall. The other Pilot advised Pilot to recover the aircraft but in return other Pilot did not get any response from the PIC. Thereafter immediately other Pilot took over the controls and tried to level up the aircraft and also opened up the power by pushing the throttle lever forward, to gain height. The aircraft could not gain height, crash-landed and there after toppled upside down. Therefore it is inferred that improper handling of aircraft by the pilot was the cause of accident.

2.5 Aerodrome

It was observed that the grass height was approx. 6 feet at the green area on both sides of the Runway. Even though the Aerodrome inspection schedule dated 12th of November 2014 stated “Grass Cutting Required, the same was not complied to and this resulted in hindrance to locate the aircraft during search and rescue.

2.6 Circumstances leading to the Accident:

On 19.11.2014 aircraft was departed from runway 25 at 0509 UTC for emergency exercise. The weather at the time of takeoff was fine. At 0518 UTC before first touch and go the Pilot was maintaining listening watch. At time 0519 UTC first exercise was done and at 0524 UTC second touch and go was carried by the aircraft. Aircraft took off at around at 0524 UTC for third simulated engine failure exercise and thereafter ATC lost visual contact with aircraft.

During first circuit of the third sortie of the day Pilot tried to practice downwind-simulated emergency and glided back to runway 25. Thereafter again took off for second circuit and again practiced downwind-simulated emergency and glided back to runway 25. During third circuit Pilot tried to simulate “engine failure after takeoff emergency”. Non-adherence of the standard procedures made the aircraft to crash land with high impact.

2.7 Documented Procedure

At the time of accident M/s MPFC was following Flight Instructor manual of Civil Aviation Safety Authority of Government of Australia as a guidance material as there was no requirement by DGCA to have an approved training procedure manual. However after the accident the requirement of approved training procedure manual was laid down by DGCA in CAR Section 7, Series D, Part I, Issue II, Revision I dated 30.01.2015 .

3. CONCLUSIONS:

3.1 Findings:

1. The Certificate of Airworthiness, Certificate of Registration, certificate of flight release and ARC was valid on the day of accident.
2. The Pilot was appropriately qualified to operate the flight.
3. Other Pilot accompanying in the flight was also qualified.
4. All the concerned Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications on this aircraft, engine and propeller were found complied with.
5. The aircraft was airworthy, had carried out two sorties with different set of crews and no snag was reported.
6. The weather at the time of accident was fine with visibility 5000 m haze and winds 50/05 kts.
7. CFI had authorized the flying and was on cross country at the time of accident and the flying activities were supervised by PI at the time of accident.
8. Scrutiny of Authorization Book reveled that Blank Authorizations were signed by CFI, without date and time, on number of pages.
9. Pilot was accumulating hours for issue of his AFIR rating and the other Pilot who was API accompanied the Pilot on board, without the knowledge of PI of MPFC, on ground.
10. Aircraft departed at 0509 UTC for simulated engine failure exercise from runway 25. At 0518 UTC, before first touch and go, the Pilot was maintaining listening watch.
11. At time 0519 UTC, first touch and go circuit was done and at 0524 UTC second touch and go was carried by the aircraft. Aircraft was last seen taking off at the end of rwy 25 at 0524 UTC for third simulated engine failure exercise and thereafter ATC lost visual contact with aircraft.
12. The aircraft crash landed at 0527 UTC and was located at 0540 UTC between isolation bay and localizer towards left side of runway25 end.
13. It was observed that the grass cutting was not done in regular interval and height of grass was a hindrance in locating the crashed aircraft.
14. Standard procedures while practicing simulated engine failure was not carried out. Instead of landing ahead on the runway the Pilot tried to come back on runway 25 by taking a steep left turn and crash landed on left side (kutcha) of runway 25 end.

3.2 Probable cause of the Accident:

The aircraft stalled, impacted the ground and nose rolled over due to erroneous steep left turn by pilot while practicing simulated engine failure, with throttle in idle position.

4. SAFETY RECOMMENDATIONS:

4.1 DGCA

i. DGCA may carry out Safety Audit of all activities of MPFC.

ii. DGCA may issue safety instructions to all flying clubs to refrain carrying un - authorized persons during solo flights.

4.2 MPFC

i. MPFC to ensure that the laid down training procedures are followed without any deviation.

4.1. Airports Authority of India, Indore

i. Airports Authority of India shall ensure that the Maintenance of green areas outside Air Strips is as per stipulated rules.

(Shilpy Satiya) 28/12/17
Air Safety Officer, AAIB
Member, COI – VT- EUE

(Raje Bhatnagar) 28/12/17
Assistant Director of Airworthiness,
Chairman, COI – VT- EUE

Date: 28th of Dec 2017

Place: New Delhi