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FINAL INVESTIGATION REPORT ON ACCIDENT TO CESSNA-152, VT-MMM OF M/s YASHAIR LTD. AT SHIPRA RIVER, KALYANPURA, UJJAIN, MADHYA PRADESH ON 19.05.2010.

Office of Director of Air Safety, Mumbai
Directorate of Air Safety,
Directorate General of Civil Aviation, New Delhi.

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FINAL INVESTIGATION REPORT ON ACCIDENT TO YASH AIR LTD AIRCRAFT CESSNA-152, VT-MMM NEAR SHOPRA RIVER, KALYANPURA, UJJAIN, MADHYA PRADESH ON 19/05/2010.

1.	Aircraft	
	Type	Cessna- 152
	Nationality	Indian
	Registration	VT-MMM
2	Owner/Operator	Yash Air Ltd.
3	Pilot – in –Command	CPL Holder
	Extent of injuries	Fatal
4	Co-Pilot	Trainee Pilot
	Extent of injuries	Fatal
5	No. of Passengers on board	Nil
	Extent of Injuries	Nil
6	Last point of Departure	Ujjain Airstrip
7	Intended landing place	Ujjain Airstrip
8	Place of Incident	Shipra River, Kalyanpura, Ujjain
9	Date & Time of Accident	19/05/2010, 1100 UTC Approx

ALL TIMINGS IN THE REPORT ARE IN UTC

SUMMARY

The Chief Flight Instructor, YashAir Ltd authorized the Commercial Pilot License holder to do Circuits and Landings. He took his friend Student Trainee pilot on board with the permission of CFI. He carried out five circuits and during the Sixth circuit they did not report on downwind. Thereafter the Flying Institute received a call stating the aircraft has met with an accident. The aircraft at the end of crosswind leg deviated to right

and went over the Shipra river. The PIC carried out low flying over the Shipra River and went in to the electric cable and crashed in dry river bed. The aircraft immediately caught fire and both the occupant died due to severe burn injury.

1. FACTUAL INFORMATION.

1.1 History of flight

The PIC was authorized by the Chief Flying Instructor for carrying out PIC flying at academy. He was authorized by CFI to carryout circuit and landing for the duration of one hour. The circuit and landing is a pattern normally associated with training of the student pilot. The PIC already had approximately 271:40 hrs of flying experience with valid license and medical. The PIC took briefing before the flight as per CFI. The daily inspection was carried out by AME and the aircraft was released for flight. The fuel on board was 90 litres. The both LH and RH tanks were topped up 45 litres each.

The PIC took another trainee pilot of the flying institution for the flight after the authorization from CFI for joy ride. The aircraft Cessna 152, VT-MMM took off at 1010 UTC for one hour of circuit and landing. The runway in use was 31 due to the wind conditions. The aircraft carried out 5 circuits and landings in course of 50 minutes. The fuel consumed was approx 31 litres considering consumption at 38 litres/hr. The fuel on board during the 6th circuit would be approximately 58 litres. The R/T was conducted by another pilot from the aircraft VT-EEE on ground.

During the 6th circuit the PIC turned left and thereafter was advised to report left downwind. The aircraft did not turn to the left to downwind but went further turned approx 30 degree left and was on the river Shipra. He continued over Shipra and came down to approximate height of 200 to 150 ft over the river bed. The crash site is approximately 3.9 Km away from the airstrip.

There was no R/T call from the aircraft after the previous call of turning left. The pilot handling R/T tried to raise the aircraft to know position around 1110 Z. In mean time the phone call was received by the

CFI and he along with staff reached site of crash and found the aircraft burning along with the occupant.

There was no information from the academy to the regional air safety office. The regional office made an attempt to contact the CFI but was not available on telephone. The CFI was reached on 20/05/2010 by DGCA representative after reaching the site of crash. The first communication was established in person with CFI on 20/05/2010.

1.2 Injuries to persons.

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	2	Nil	Nil
SERIOUS	Nil	Nil	Nil
MINOR	Nil	Nil	Nil

1.3 Damage to aircraft.

The aircraft was destroyed. The aircraft was broken into to 5 major portions. The all 5 major portions i.e., engine, fuselage & cockpit, LH wing, RH wing and empennage were found at one place. The aircraft was burnt due to fuel fire. The LH wing fuel tank had blasted and also melted because of excessive heat due to fire.

1.4 Other damage:

The 33 KV line wires were plying across the river Shipra from electric pole to pole. The R phase of these 33kv wires had broken due to aircraft impact and was found near the wreckage. Thereafter the aircraft had also impacted 11KV 3 wires and even these cables were found near the wreckage.

1.5 Personnel information:

1.5.1 Pilot – in – Command:

Age:	20 yrs approx
Licence:	CPL holder
Date of Issue:	18/09/2009

Valid up to:	18/09/2014
Category:	Aeroplane
Class:	Single engine land
Endorsements as PIC:	Cessna 152A
Date of last Med. Exam:	16/06/2009
Med. Exam valid up to:	15/06/2010
FRTO License No:	13900
Date of issue of FRTO:	19/09/2009
Validity of FRTO:	18/09/2014
Total flying experience:	271:40 hrs
Experience on C152:	230:45 hrs
Experience as PIC on C152:	199:10 hrs
Total flying experience during last 30 days:	24:55 hrs
Total flying experience during last 07 Days:	06:00 hrs
Total flying experience during last 24 Hours:	01:30 hrs

1.5.2 Student Trainee Pilot:

Age:	20 yrs approx
License:	Student Pilot License
Date of Issue:	20/09/2008
Valid up to:	5 yrs from issue
Category:	Aeroplane
Class:	Single engine
Date of last Med. Exam:	03/11/2009 Class I
Med. Exam valid up to:	02/11/2010
FRTO Licence No:	3560
Date of issue:	06/10/2008
Valid up to:	05/10/2018
Total flying experience:	162:45 hrs

Experience on type:	162:45 hrs
Total flying experience during last 07 Days:	08:30 Hrs
Total flying experience in last 24 Hours:	01:10 hrs

1.6 Aircraft information:

Aircraft Cessna-152, registration VT-MMM, the last Certificate of Airworthiness inspection was carried out on 30/05/2009 and C of A was valid till 29/05/2010. The Aircraft had done 12443:00 hrs since new. It had 515:40 hrs since last C of A renewal. The engine type Lyco-O-235N2C with serial No L-14087-15. The engine was overhauled on 17/06/2008 and had done 1768:25 hrs. The propeller type was Senseinch and had serial no K-9756. It was fitted on aircraft on 12/02/2009 and had done 822:20 hrs. The last major inspection was 100hrs/6 months on 10/04/2010. The Radio 180 days inspection was valid up to 08/09/2010.

The propeller was changed on 12/02/2009 at 11620:30 hrs and the TBO for the same is 2000 hrs/12 years. Though the life was in terms of hrs was left the reason for the removal is not documented.

This aircraft has approximately 12:25 hrs of flying in last one month and approx 02:40 hrs in last 24 hours. This indicates that the aircraft was serviceable however it was used sparingly.

The DI was carried out by AME for VT-MMM on 19/05/2010 at 0615 hrs during the inspection the aircraft was refuelled 45 litres in left and 45 litres in right tank respectively.

1.7 Meteorological information:

The MET SPECI of Indore Airport for the relevant time under examination are as mention below;

Observation report of 1000Z
Winds 340/12 kts
Vis 6 KM
Temp 42 Centigrade
QNH 1004

Clouds SCT 10,000 ft, BKN 25,000 ft
Observation report of 1100Z
Winds 270/15 Kts
Vis 6 KM
Temp 42 Centigrade
QNH 1004
Clouds SCT 10,000Ft, BKN 25,000 Ft

The above observation could be used to approximately estimate the prevailing weather condition at Ujjain airfield. There is no procedure of getting the weather and maintaining the record at M/s Yash Air facility.

1.8 Aids to navigation:

The aircraft VHF R/T was used to communicate the position to the stationary aircraft in the dispersal of M/s Yashair flying institute. The on board GPS is extensively used for navigation purpose. The trainee pilots during flying report their position to the stationary aircraft in circuit pattern. The R/T controls and coordinate aircrafts flying simultaneously is done by pilot in stationary aircraft.

1.9 Communications:

The aircraft VHF set was only the means of communication and the stationary aircraft VHF. It was used to coordinate between the various aircraft flying in the circuit and maintain separation.

1.10 Aerodrome information:

The Ujjain Airfield information is as follows;

Elevation	:	1650 ft
RWY length	:	3000 ft
Frequency	:	Communication – 123.80 MHz
Navigation Aid	:	VOR: 116.70MHz(IID) 011/23 NM IID
Navigation Aid	:	ADF: 335 KHz(ID) 011/23 NM ID

The Runway is black tarmac type with 13/31 orientation; it has no marking except centerline as per the ICAO standard recommended practices. There no coordination procedure between ATC, Indore and aerodrome Ujjain.

The tower is available but it is in dilapidated condition now and abandoned. In present state it is dangerous to use for controlling and coordinating operation.

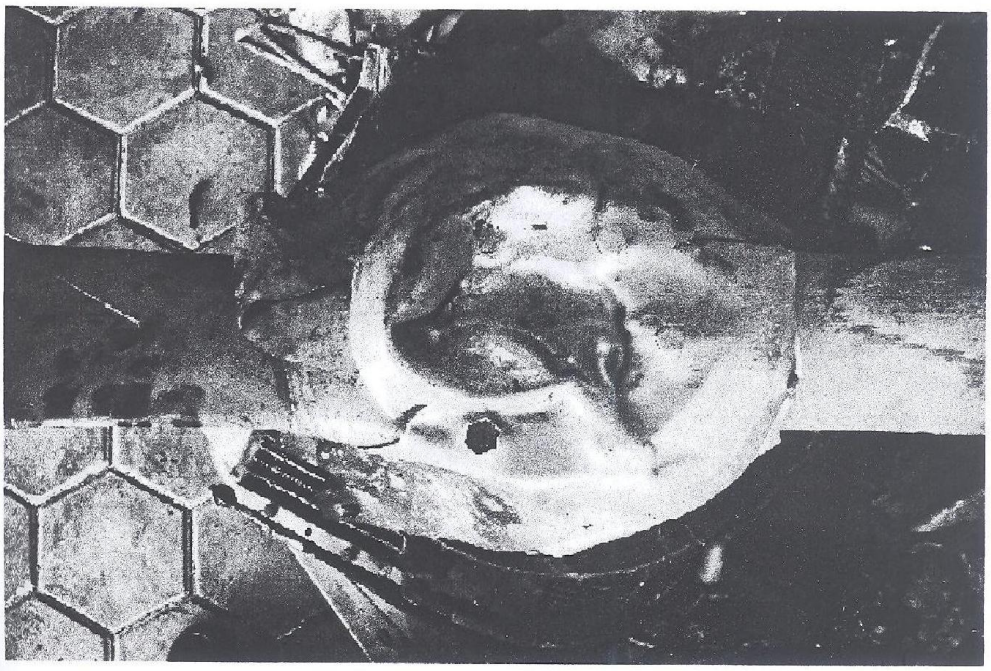
1.11 Wreckage and impact information:

The wreckage was found to have accumulated at one place. There by giving an indication that the forward speed before impacting the ground was insignificant. The complete wreckage could be seen in 25 Ft X 25 Ft area on the river bed of Shipra River, Kalyanpura.

The wreckage was concentrated in 5 distinct portions in the above mentioned area as shown in the sketch. The portions are designated as areas as follows;

Area 1 : Engine wreckage
Area 2 : Fuselage & cockpit wreckage
Area 3 : Wing(RH) wreckage
Area 4 : Wing(LH) wreckage
Area 5 : Empennage wreckage

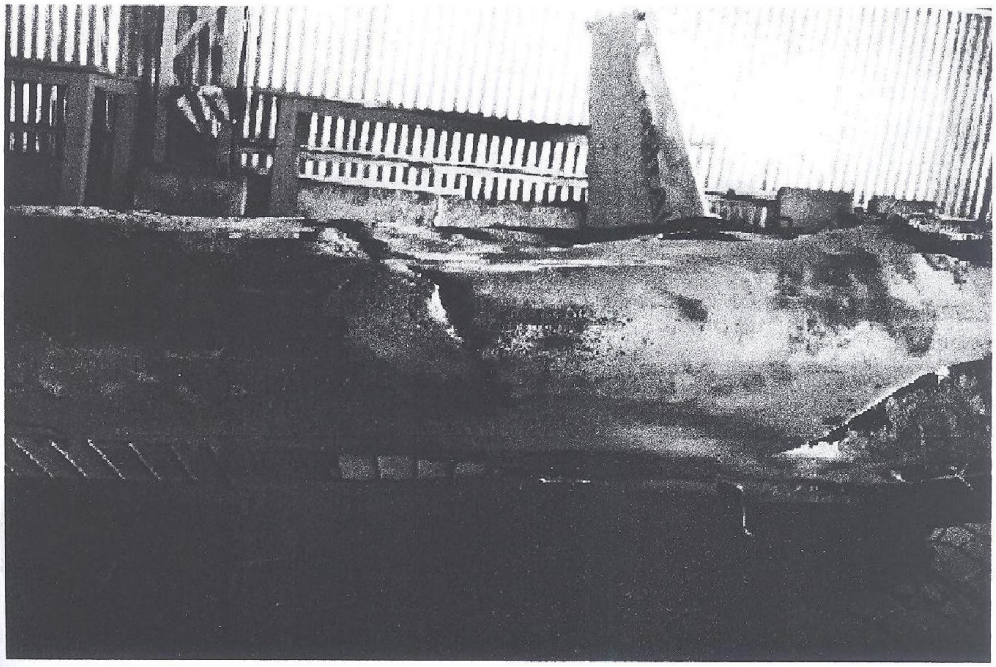
The aircraft had taken-off from RWY 31 and there after took a left turn by 90 deg to the runway to join cross wind. The trainee pilot took the aircraft for a longer cross wind leg and turned to left by approx 30 deg left on the downwind over the Shipra river. The aircraft was perilously low on height at the time of impact with high tension electrical wires. The aircraft must have been flying at heading approx 340 to be aligned with the river. The aircraft must be flying then at approximate 150 Ft over the river bed. The forward speed of aircraft was low and the propeller did not shown signature of engine being on power when the aircraft hit the ground.



Spinner mark exhibit low power impact on nose with river bed

The propeller has the marks of electric cable on the leading edge and the spinner. The rubbing marks pattern indicates that the propeller was on power at the time of impact with the electric cable. The nose landing gear strut is also having a rubbing mark of the electric cable thereby peeling the white paint coating on the frontal surface.

The main landing gear struts also has the rubbing marks on the frontal surface. The RH wing has a cut of approx 60 degree indicating the bank of right after hitting the first cable. The second cable must have cut the wing RH leading edge.



The electric cable sliced the RH leading edge of the wing

Thereafter the aircraft completely got entangled and toppled and fell on the river bed opposite to the direction of flight. The propeller had completely stopped by the time aircraft hit the second cable. The aircraft fell 10 – 12 ft ahead of the path of second cable. The cable pieces found on the site of accident indicate that few of the strands broken got completely got compressed appearing like collection of rings woven in wire.

The aircraft caught fire immediately after falling and impact due to fuel lines breaking at the carburetor end. The fuel falling on the hot zone immediately engulfed the portion containing fuel like wings and the engine. The both occupants were alive however could not come out of the aircraft. The both pilot and copilot seat structural frame did not show any deformation due to vertical impact.

The both RH and LH wing portions housing the fuel tanks were seen completely destroyed due to the fire. The wing fuel tanks showed the signs of small explosion due to high temperature which is normal in case of fire.

The wreckage sketch along with the observation is attached in annexure for reference. The damage assessment of this wreckage and the item of component/components is distinctly exhibiting high temperature as the most of the aluminum items found melted. As per the video recording provided by the district administration the District Magistrate along with police personnel had reached the site when the aircraft was still burning. These are an indication that the volume of fuel in aircraft was very high. There was no firefighting which could reach to the site due to terrain. The villagers and volunteers were seen throwing sand and water however the same was not enough to douse the fire. The officials from M/s Yashair were also available at that time.

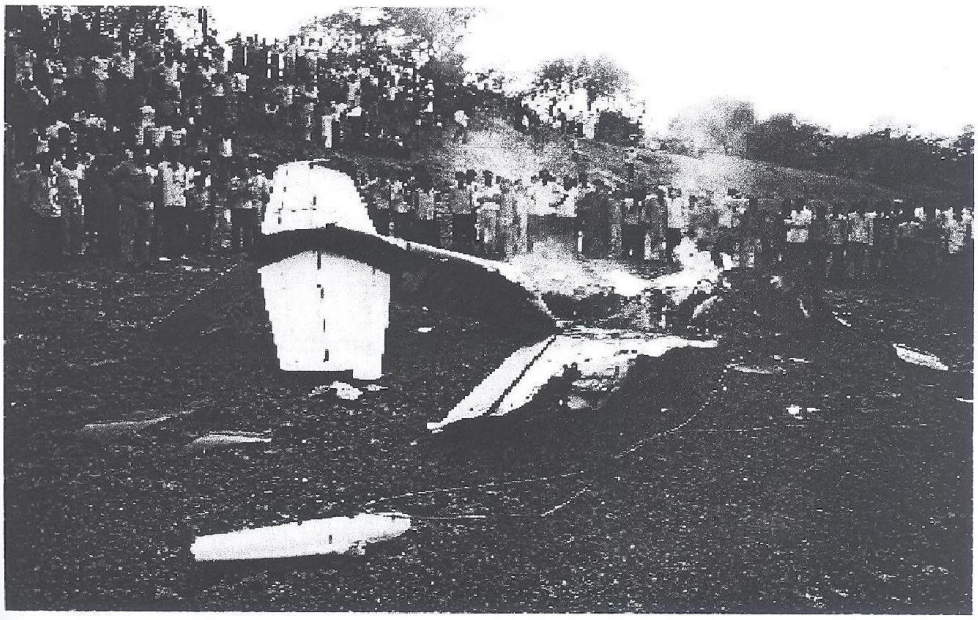
1.12 Medical and pathological Information:

The postmortem of both the pilot and copilot was carried out at District hospital, Ujjain. The postmortem of Pilot and copilot revealed that they died due to cardio respiratory failure as a result of extensive burn of the body. The burn could be due to aircraft crash.

The total burn areas of the bodies were 100% and the degree of burn was 5^{th} to 6^{th} degree burn. The bodies were completely charred with gross destruction of tissue, muscles, bones etc.

1.13 Fire:

The beginning or initiation of the fire was the impact on ground. This could be said with good degree of certainty because the electric cable of 33KV was inspected and did not reveal any fire traces. The fire was confined to the aircraft and the 11KV cable which was found along the wreckage.



The fire initially began on impact with ground due to the breaking of carburetor and the AVGAS getting sprayed on to the hot section of the engine. The carburetor is at the bottom of the engine and just ahead of the exhaust manifold. The exhaust manifold is hot and any fuel or fuel vapour on to it can cause immediate fire. This has caused the complete engine to catch fire. Hence the complete engine cowling melted. This fire had spread to the wing tanks situated right above the cockpit and engulfed the whole cockpit. There was no indication of inflight fire as no trail of fire or fuel could be observed on the rear of the fuselage.

1.14 Survival aspects:

The crash was not survivable due to the instant fire and impact. Due to the momentary disorientation during the crash and in all probability the aircraft upside down, there was little opportunity for the pilots to come out of the aircraft.

1.15 Tests and research:

The Engine installed in VT-MMM , Lycoming O-235-N2C, Sr No L-14087-15 which has done 1768:25 hrs since TSO was strip examined at

Bombay Flying Club and following observation and inferences made during the course on examination.

External Inspection:

Observations	Inferences
The engine inspected externally and complete Engine is found with burning and black smoke Marks.	Due to fire
1) Crankshaft Flange Crankshaft flange found bent	Due to impact
2) Crankcase breather hose, oil cooler connecting Hose, oil pressure hose found burnt.	Due to fire
3) Fuel hose connection to carburetor found burnt	Due to fire
4) Ignition harness (Magneto to Spark plug) found burnt	Due to fire
5) Starter electrical cable found burnt	Due to fire
6) LH Magneto found burnt and detached	Due to fire & Impact
7) RH Magneto found burnt	Due to fire
8) Oil filter Adapter found burnt & detached	Due to Impact & fire
9) Carburetor top found broken, damaged And detached from engine	Due to impact
10) Alternator found damaged	Due to impact
11) Exhaust pipe of cylinder 1 found bent	Due to impact
Flange of exhaust pipe of cylinder No3 found detached from the engine	Due to impact
Exhaust pipe of cylinder No4 found bent	Due to impact
12) Induction filter found damaged & burnt	Due to fire

13) Air muffler found bent	Due to impact
14) Rocker oil drain pipe of cylinder No3 found Damaged and detached from engine	Due to impact

The engine was rotated externally from the propeller flange and the rotation was found to be smooth without any obstruction.

Internal Inspection

1) All spark plugs removed and inspected for the condition; the bottom spark plugs found gummed up with oil and carbon	Nil
2) Oil sump with oil suction filter and oil suction pipe found satisfactory	Nil
3) Accessory housing assembly removed and found satisfactory	Nil
4) Oil pump assembly removed from accessory housing inspected for condition and found satisfactory	Nil
5) All gears removed and checked for condition and found satisfactory	Nil
6) All cylinder with piston removed from engine, inspected for condition and found satisfactory	Nil
Oil seal ring of cylinder No3 and cylinder No4 found flattened at one point	Due to Heat
7) The complete crankcase dismantled and checked for internal condition. The black marks observed on the rear side on both the halves internally	Due to heat
8) Crankshaft with bearings and gear removed and checked for condition, found satisfactory	Nil

9) Connecting rod with bearings removed and checked for condition. The connecting rod of cylinder No3 and No4 found with bluish mark	Due to heat
10) The camshaft removed and checked for condition, found satisfactory	Nil

The overall observation reveals that the aircraft met with an accident and caught fire resulting in impact damage and burning, but there was no indication of engine operational failure.

External inspection of the engine reveal that the fire was more on the RH side hence no 1 & 3 cylinder had discoloration due to high temperature. The paint was seen peeled off due to high temperature. The flange end of the crank shaft which is attached to the spinner with 6 bolts, on inspection it was found to be bent opposite to the direction of blade rotation. The bent was slight indication that the engine was on power but definitely not high enough to bend it significantly. The flange had also bend on one side indicating the bending of the propeller blade due to impact.

1.16 Organizational and management information:

The registered office of M/s Yashair Pvt Ltd is located in Indore. The flying training activity is conducted in Ujjain. The Accountable Manager is seated in the Indore office. The Chief Flight Instructor conducts the flying training activity in Ujjain. The organization is approved by DGCA.

The Deputy QCM approval of the AME has lapsed on 30/04/2010 it was revalidated for the period of 1(ONE) month till 31/05/2010 due to unavailability of the QCM. However the letter of approval had not come till date when the documents were sealed.

1.17 Additional information:

1.17.1 Maintenance Aspect:

The aircraft Cessna 152, VT-MMM had done 12443:00 hrs total since new. The last certificate of Airworthiness was carried out on 30/05/2009 and since then it has done 515:40 hrs. The aircraft is fitted with Lycoming engine type Lyco-O-235-N2C and serial No is L-14087-15. The last engine overhaul was carried out on 17/06/2008 since

then engine has done 1768:25 hrs. The propeller type fitted is of Senseinch make and the serial No is K-9756. The date of fitment is 12/02/2009 and has done 822:20 since last overhaul. The last Major inspection of 100 hrs/6 months was carried on 10/04/2010. The 180 days Radio inspection was valid up to 08/09/2010. The ELT NRL was valid up to 08/03/2011 and the ELT Battery is valid up to 31/12/ 2010.

The component status was checked instruments, undercarriage and hydraulics system, brake hoses, air filters, aircraft components, engine components, engine controls and propeller and all were found valid.

The propeller was changed on 12/02/2009 at 11620:30 hrs and the TBO for the same is 2000 hrs/12 years. Though the life was in terms of hrs was left the reason for the removal is not documented.

This aircraft has approximately 12:25 hrs of flying in last one month and approx 02:40 hrs in last 24 hours. This indicates that the aircraft was serviceable however it was used sparingly.

The Aeromobile license of aircraft VT-MMM was found to have been valid upto 31/12/2008. The renewed license was not available during the document scrutiny.

The aircraft VT-MMM has been maintained by AME with approval No 49/2009. He has DI approval and had been carrying out the ground run since 15/07/2009. On 19/05/2009 the DI was carried out by the said AME at 06:15 hrs. The aircraft had 45 liters of fuel on left and 45 litres of fuel in right wing tank respectively.

The Deputy QCM approval of the AME has lapsed on 30/04/2010 it was revalidated for the period of 1(ONE) month till 31/05/2010 due to unavailability of the QCM. However the letter of approval had not come till date when the documents were sealed.

The magnetos were sent for inspection to the DGCA approved M/s VINI Aviation, Bhopal however there was no record to show that the QCM has carried out inspection of the vendor from time to time to ascertain the level of quality control.

On the day of accident there was no contact established by the QCM/CFI to intimate occurrence of accident to regional airsafety office of jurisdiction. No contact could be established with Dy. QCM/ CFI to coordinate for the purpose for proceeding with investigation.

1.17.2 Operational Aspect:

Aerodrome & ATS:

M/s Yash Air Ltd had communicated to Senior Manager (ATC), Indore Airport ATC about the commencement of the flying activity at Ujjain aerodrome on 03/09/2008. In response the ATC had stated the procedure followed by M/s Yash Air of maintaining altitude up to 4000 AMSL within 10 NM need to stop immediately as the track and distance of Ujjain is 010/23NM from IID VOR which lies in the control zone of Indore ATC. The local flying up to 2700ft only may be carried out and for further climb positive clearance need to be taken from Indore ATC. M/s Yash Air immediately sent letter regarding the needful compliance shall be accomplished.

However it was insisted by AAI headquarters upon ATC Indore to prepare a Standard Operating Procedure for the Yash Air which fall under the control zone. The same could not be complied with lack of expertise with ATC, Indore. Thereafter the matter was taken up with GM (Aero), Western Region, ATS expressing the concern that no coordination procedure has been established for the M/s Yash Air operating in the Indore ATC control zone. No progress was achieved and the flying continued.

Because of no SOP made by AAI, the operations continued and no proper reporting procedure was made and the flying in Ujjain could be monitored.

Pilots Records:

The pilot had India Commercial Pilot License issued on 18/09/2009. He had a PIC endorsement of Cessna 152A. The license was valid up to 18/09/2014.

The Flying Trainees Progress Record was scrutinized and it was observed that the entries are not made. Only name and Date of birth is

written on the dossier. The signature of the pilot on dossier is not matching with that appended on the CPL. The entries in the dossier available with YashAir is from 03/05/2010 till 18/05/2010 and the flying hrs accumulated is exactly 10 hrs.

The copilot was issued with Student Pilot License No YAL – 282 issued by Yashair on 20/09/2008. The date of Medical was 24/07/2008 and was valid upto 23/07/2009.

The scrutiny of the Dossier reveled that student pilot had a break in flying training from 26/12/2008 to 20/03/2009. The total flying hours completed by him were 162:45 hrs as on 18/05/2009.

Authorisation Book/Personal Logbook:

As per the authorization book for VT-MMM, the PIC had done flying on 27/03/2010. He had again done a flying with CFI for AFIR pattern from 02/05/2010 till 18/05/2010. On the day of accident CFI authorized only PIC for circuit and landing and does not have the entry of trainee pilot on authorization book.

As per the Personal logbook the PIC had not carried out flying after 03/08/2009. He received his CPL on 18.09.2009. Thereafter he resumed flying at Yashair on 01/03/2010 till the date of accident. The entries made from 02/05/2010 till the date of accident were with the remark as AFIR pattern. This clearly indicates that he was accumulating the hours for his AFIR rating at Yashair.

2. ANALYSIS

2.1 Serviceability/Maintainability of the aircraft

The M/s Yashair maintenance is approved under CAR Section 2 Series E. Aircraft Cessna 152; registration VT-MMM had done total 12443:00 hrs since new. The last Certificate of Airworthiness inspection was carried out on 30/05/2009 and since then it has done 515:40 hrs. The aircraft is fitted with Lycoming engine type Lyco-O-235-N2C and serial No is L-14087-15. The last engine overhaul was carried out on 17/06/2008 since then engine has done 1768:25 hrs. The propeller type fitted is of Senseinch make and the serial No is K-9756. The date of

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The component status was checked instruments, undercarriage and hydraulics system, brake hoses, air filters, aircraft components, engine components, engine controls and propeller and all were found valid. The lifed components were replaced on completion of calendar/TBO.

The propeller was changed on 12/02/2009 at 11620:30 hrs and the TBO for the same is 2000 hrs/12 years. Though the life in terms of hrs was left the reason for the removal is not documented. It was a premature withdrawal hence the reason should have been properly documented.

This aircraft has done approximately 12:25 hrs of flying in last one month and approx 02:40 hrs in last 24 hours. This indicates that the aircraft was serviceable however it was used sparingly.

The aircraft VT-MMM has been maintained by AME with approval No 49/2009. He has DI approval and had been carrying out the ground run since 15/07/2009. The aircraft had 45 liters of fuel on left and 45 litres of fuel in right wing tank respectively. On 19/05/2009 the DI was carried out by the said AME at 06:15 hrs.

The Deputy QCM approval of the AME has lapsed on 30/04/2010 it was revalidated for the period of 1(ONE) month till 31/05/2010 due to unavailability of the QCM. However the letter of approval had not come till date when the documents were sealed.

On scrutiny of documents it was found that the magnetos were sent for inspection to the DGCA approved M/s VINI Aviation, Bhopal however there was no record to show that the QCM has carried out inspection of the vendor from time to time to ascertain acceptable level of quality control.

The Dy. QCM/CFI did not send the required immediate intimation to DGCA about the occurrence of accident.

2.2 Operational Aspect

The CFI stated that on afternoon of 19/05/2010 he authorized PIC, CPL holder to carry out his PIC flying. He was directed to carryout circuit and landing on Cessna-152, VT-MMM for the duration of 01 hr. The PIC had approx 260 hrs of flying experience. The PIC requested his friend Student Trainee pilot on board with him. CFI, after giving necessary instruction authorized and cleared to undertake the flight.

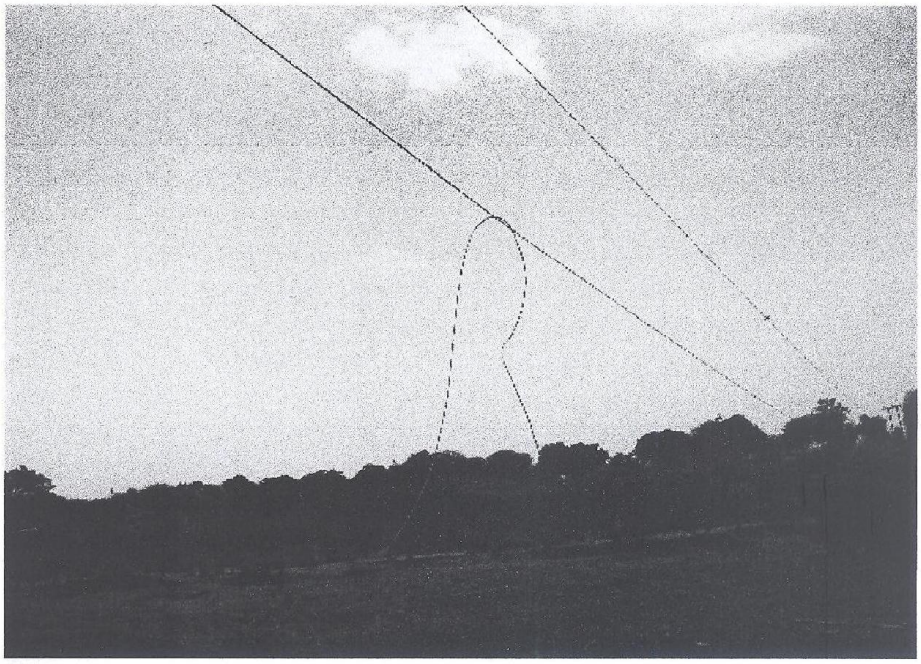
The first takeoff was at 15:40 IST for series of circuit and landing for duration of 01 hr. The runway in use was 31; weather was fine with westerly winds. Capt Shashank Ajnadkar was doing ground R/T duty on aircraft VT-EEE.

He carried out 5 circuits and landing in course of 00:50 hrs on sixth circuit, he reported turning left and thereafter he was advised to report left downwind. There was no call from the aircraft after previous call of turning left. Capt Shashank tried on R/T to know his position around 16:40 IST and he reported to CFI. He in mean time received a call that the aircraft had crashed and was burning with both occupants on board.

On being queried as on what capacity PIC was authorized by CFI to carry his friend he stated that he under the privileges of his license authorized him to carry his friend. CFI further stated that the student trainee pilot had gone on board in the capacity of passenger for joyride.

The PIC was issued license on 18/09/2009 with validity of 5 years. The medical was valid till 15/06/2010. As per personal flying logbook the entry made was on 03/08/2009 was of completion of 200 hrs making him eligible to appy for CPL. Subsequently, the entries made are from 1/3/2010 in dossier. This indicates that no flying was done by PIC for approx 7 months. The entries made from 02/05/2010 till 17/05/2010 are with the remark of AFIR pattern and he had accumulated 09 hrs of AFIR training. This indicates that the PIC was accumulating hours for his AFIR rating. He had flown total 71:25 hrs at Yashair after his CPL. On the day of accident he was authorized by CFI to carryout circuits and landings. The carriage of Trainee Pilot entry is not on authorization book hence carrying out circuit and landing with student pilot seem more than coincidental. The joyrides are normally given to non-flyers and not to the trainee pilots.

Capt Shashank Ajnadkar, Assistant Pilot Instructor stated he was performing R/T duty and the same concurred with the stated position of CFI.



The broken cable of 33KV electric line across Shipra river

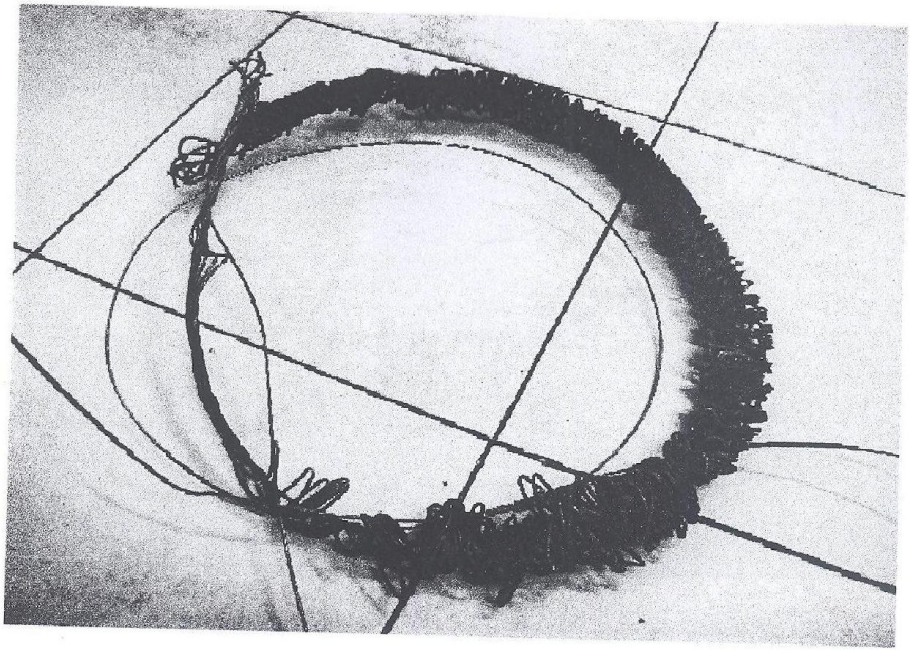
The eyewitness from the village Kalyanpura stated that every day the M/s Yashair aircraft fly from the airstrip with trainee pilot. These aircraft fly over the village. On 19/05/2010 he was in his field adjacent to Shipra river, at about 16:45 hrs he saw YashAir aircraft coming very slow. He was unable to hear any engine sound. The aircraft first went into 33KV electric cable and broke one cable that was approximately 300 to 400 ft away from him. After breaking one cable it went into 11KV electric cable and broke all three and fell down. The aircraft's one wheel broke and other wheel got entangled into the cables. Before he could reach the spot there, wreckage started emanating smoke and was in fire. The fire suddenly spread, when villagers attempted to save the pilots few blasts kept them away. The eyewitness ran away due to blast when he felt nothing could be done he informed the Narwar Police

Station. He also stated that may times the pilot get the aircraft very low. At times they go up and down over the river.

The aerial view at the beginning of downwind left hand circuit

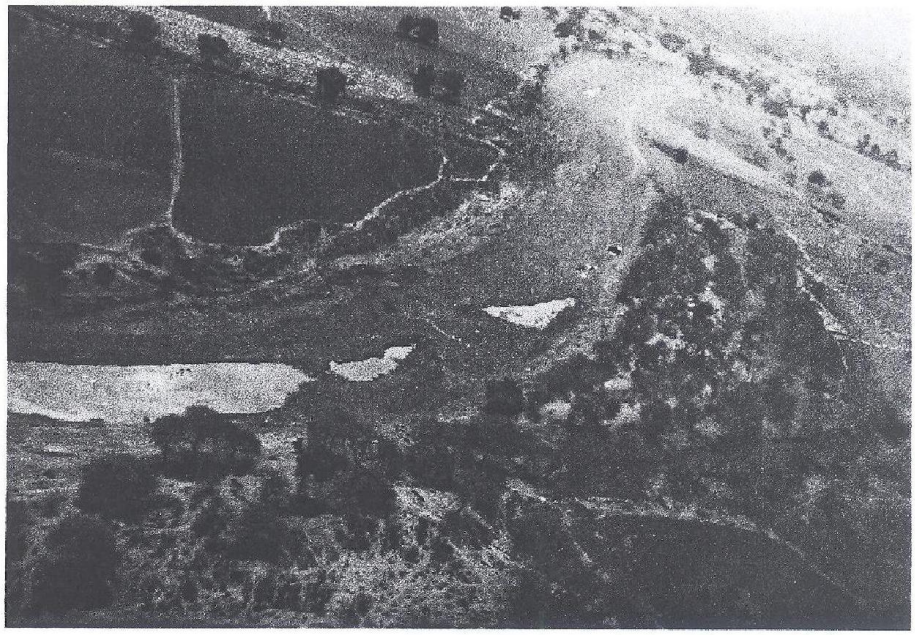
This statement was also corroborated with other witnesses and one of them stated that the pilots fly at times so low that we are under fear of any possible mishap.

The Assistant Engineer, State Electricity Board stated that the 33KV electric line had three cables. It is 750 ft long from pole to pole across the river. One of the cable of 33KV admeasuring 300 ft broke and wherever it has broken it has formed a lump of rings. Thereafter the aircraft went into 3 electric cable of 11KV, which was 1050 ft long from pole to pole across the river. The aircraft broke this cable into 3 pieces of 450 ft and the aircraft was enmeshed into it. However there was no electric power in these cables during the accident.



Condition of the 33 KV cable found with wreckage

In view of the above statement and facts it could be stated that the aircraft was low when it was on crosswind. Further it came low by reducing the power to fly low over the river. Just before the crash site two water bodies could be seen and attempt was made by the pilots to have a closer look of water bodies (Photo).



The crash site just ahead of water bodies in shipra river

The PIC could not see the electric cables as it is difficult to sight the same in the background and went into it. The aircraft broke first cable, however since the power was low could not lift the aircraft as the distance between the two cables was approximately 200 ft. Hence after impacting with the first cable considerable speed had washed and it after hitting the second group of cable aircraft just fell down.

The issue is why the PIC was unable to see the cable ahead. The reason could be in the backdrop of available fact, is that the aircraft was to climb to 400 ft AGL upwind. Thereafter take a left turn and climb to 1500 ft on crosswind leg. The PIC in all probability did not climb to 1500 ft but started a descend on the Shipra river which was not in the circuit pattern. The crash spot is immediately after the water bodies. The electricity cables were almost at the beginning of the water bodies. The PIC must have lost the cable in the background due to attitude and flight path he followed during his descend over the river as corroborated by eyewitness statement. Also the cable were not visible from 1000 ft longitudinally which can be seen from the photograph

taken from ground on 20/04/2011 at approximately same time and similar weather condition.

Further, the propeller blades do not exhibit the normally expected tell-tale marking due to impact under power. However it may be noted in this case the impact is in air with the elctricity cable of aluminium. The propeller blade rotating plane was parallel to the electric cable. Hence to expect a hit mark on the leading edge of the propeller is unlikely. But the spinner has exhibited the abrasion due to rubbing of the electric cable. The aircraft first impacted with the thicker 33 KV cable and broke approx 300ft causing winding of it on the spinner. Thereafter the angular momentum left in the blade was further reduced to insignificant value due to impact with another 3 lines of electric cable of 11KV. Hence when the aircraft impacted ground it was a vertical fall as the forward momentum was completely absorbed by the stretching and breaking of the cable simultaneously. However the six bolts on the flange end of crankshaft had exhibited bent on the direction opposite to the rotation of the propeller.

The reason as to why the propeller blade did not show the impact is also because the rotational energy absorption must have been gradual due to winding over spinner and breaking of the electric cable. This also led to few cable strands breaking and forming a ring over the unbroken strand. Thus the propeller must have almost stopped rotating before impact on the ground. The river bed ground was also sandy hence must have further aided in minimizing the impact on propeller blades.

Finally, even if it assumed that the engine had failed in air, during the turning of downwind. Then the easy course would have been to trade the 1500 ft or less height and fly back in the premises of the airfield as the aircraft had full fuel and the firefighting services were available in case of emergency. However he also did not give any distress call. If the option of making a force landing in the river bed was felt better option then turning and coming back to airfield, even then at end of left hand crosswind he must have been around 1500 ft then he should attempted to land on the straight stretch of dry river bed which was available immediately. He flew and turned first right aligned with the river and then chose a spot which was just after left bend of the river bed. Further, the 60 deg cut on the RH wing due to cable indicate the attempt of maneuver to avoid the cable was made. However it was too

late to retrieve aircraft as the MLG struts and NLG oleo exhibits the rubbing marks of cable thereby indicating that it was entangled completely.

The aircraft immediately caught fire after crash and engulfed it. When the fuel tanks started bursting it scared the villager further who could not give timely help to extinguish fire. The aircraft burnt with both the occupant on board. Even the district administration could not do much due to inaccessibility of the site by proper road.

3. CONCLUSIONS:

3.1 Findings:

3.1.1 The last Certificate of Airworthiness inspection was carried out on 30/05/2009 and C of A was valid till 29/05/2010.

3.1.2 The Aeromobile license of VT-MMM submitted was valid upto 31/12/2008. It indicates that the same was lapsed.

3.1.3 The aircraft had 45 liters of fuel each in right and left wing tank respectively. The total fuel on board was 90 litres.

3.1.4 The DI was carried out on 19/05/2009 by the AME at 06:15 IST.

3.1.5 The CFI on 19/05/2010 authorised PIC, CPL holder to carry out his PIC flying. However as per the pilots logbook and authorization book, the PIC was accumulation hours for his AFIR rating.

3.1.6 CFI after giving necessary instruction authorized and cleared PIC to undertake the flight along with his friend Student Trainee pilot on board for joyride seems unlikely. As the PIC was getting trained to be Assistant Flight Instructor, hence the sortie being instructional flight could not be ruled out.

3.1.7 The Deputy QCM approval of the AME has lapsed on 30/04/2010 it was revalidated for the period of 1(ONE) month till 31/05/2010 due to unavailability of the QCM. However the letter of approval was not available on 20/05/2010 when the documents were sealed.

3.1.8 The PIC kept aircraft low when it turned left for crosswind. It further came low by reducing the power after aligning with river to fly low over it.

3.1.9 The aircraft first went into 33KV electric cable and broke one cable that was approximately 300 to 400 ft away from the eyewitness. After breaking one cable it went into 11KV electric cable and broke all three and fell down.

3.1.10 The CPL holder is authorized to carry passenger however neither the operator nor the aircraft had a valid permit/approval to do so. The academy had the approval for flying training.

3.1.11 The airstrip do not have standard ICAO marking required for visual operation.

3.1.12 The standard operating procedure to operate in the control zone is not establish thereby causing hazard to the air traffic in control zone.

3.2 Probable cause of the accident:

The cause of accident was low flying and the contributory factors were no monitoring of flying activity and ineffective supervision.

4. SAFETY RECOMMENDATIONS:

4.1 Action deemed fit against CFI as per finding 3.1.5 & 3.1.6

4.2 Action deemed fit against the DY QCM as per finding 3.1.7

4.3 Action deemed fit against M/s Yash Air 3.1.10 & 3.1.12

4.4 The Standard Operating Procedure for coordination should be established between ATC, Indore and Ujjain airfield operations.

4.5 The Runway should have the standard ICAO marking for visual/night operation.

Place: Mumbai
Date: 17.12.2010

(Sanjay K Bramhane)
Deputy Director Air Safety
Inspector of Accident (VT-MMM)