FINAL REPORT ON SERIOUS INCIDENT TO M/S CHETAK AVIATION LIMITED CESSNA 421 AIRCRAFT VT-DEW AT SHIVPURI (M.P) AIRFIELD ON 21/3/2009.

1. Aircraft:	
Type	: Cessna 421
Nationality	: INDIAN
Registration	: VT - DEW
2. Owner/ Operator	: M/s. Chetak Aviation
3. Pilot – in –Command	: ALTP No. 1294
Extent of injuries	: Nil
4. Passengers on Board	: 01
Extent of injuries	: Nil
5. Place of incident	: Shivpuri Airfield 24' 30" N 08' 113" E
6. Last point of Departure	: Indore Airport
7. Intended place of Landing	: Shivpuri Airfield
8. Date & Time of incident	: 21th March, 2009; 0605 UTC (Approx.)

(ALL TIMINGS IN THE REPORT ARE IN UTC)

SUMMARY:

On 21/3/2009 M/s Chetak Aviation Cessna 421 B aircraft, VT-DEW, was operating a ferry flight from Indore to Shivpuri under the command of ALTP licence No.1294. There was also one person (M/s Chetak Aviation employee who was also a C.F.I in the company) on board. The aircraft took off from Indore at around 0447 UTC for Shivpuri airfield. Soon after take off the Radio Communication Failure occurred in the aircraft due to electrical failure. On pilot

instructions, the person on board the aircraft informed the Bhopal ATC on his mobile that they had Radio transmitter failure and were proceeding to Shivpuri for landing. There after there was no communication with Indore or Bhopal ATC. The aircraft landed late on the runway and during landing roll the aircraft swung toward the left of center line probably due to pilot inputs and exited the runway from the left of center line and went into kutcha and sustained damage. Both the occupants escaped unhurt. There was no fire and there was no injury to any person.

1. FACTUAL INFORMATION.

1.1 History of the flight

On 21/3/2009 Cessna 421 aircraft was engaged in ferry flight from Indore to Shivpuri. Prior to the flight from Indore, one of M/s Chetak Aviation company's employee who is also the Chief Flying Instructor (C.F.I) in the company's owned Flying Training School was also on board aircraft as a passenger on this ferry flight. After obtaining the ATC and MET briefing, the aircraft took off from Indore at 0447 UTC. The weather at Indore was reported to be fine with visibility 5000 meters with winds 050/04 knots with clear skies. Shivpuri is an uncontrolled and VFR airfield, it does not have any MET facility available. As per the pilot the weather estimates obtained from Indore ATC for Shivpuri were reported to be fine with no significant changes in visibility.

The Indore ATC cleared the aircraft to flight level 55. At 0456 UTC the aircraft had reported position at 20 DME out of IID (Indore Hold) and maintaining flight level 55. Indore ATC had instructed the aircraft, to report when in contact with Bhopal tower and the same was acknowledge by the pilot. At 0503 UTC ATC Indore asked for position report but there was no reply from the aircraft. The Indore ATC gave 6 to 8 times repeatedly calls but there was no response. The Indore ATC immediately informed the Bhopal tower and Mumbai FIC about Radio Communication failure with VT-DEW aircraft. The Bhopal ATC

also made number of call to aircraft but their was no reply. Indore ATC relayed calls to VT-DEW from the over flying aircraft but there was no reply. At 0532 UTC, the Chief Flying Instructor who was the passenger on board the aircraft was asked by the pilot to call ATC Bhopal from his mobile phone and informed that they were 30 Nm outbound Bhopal and due to electrical failure they had lost the RT communication. The ATC Bhopal advised the aircraft not to continue the flight to Shivpuri and land at Bhopal due Radio Communication failure, however there was no reply from the aircraft. The pilot continued the flight to Shivpuri. The pilot was carrying his personnel GPS with him which was used for the coordinates to reach overhead Shivpuri airfield. Shivpuri has a short airfield of 2800 feet.

On approaching Shivpuri airfield the pilot did not carry out the local circuit of this short airfield in order to have a better judgment as he initiated a flapless landing. During landing on runway 09 at Shivpuri, the aircraft floated a bit and landed about 800ft from the beginning of runway. He immediately applied the brakes in order to stop the aircraft. At around 150 ft remaining to the runway end the aircraft swung toward the left probably due pilot inputs and left the runway surface, the left wheel went into a small ditch and the left landing gear sheared off after which the right landing gear also sheared off and the nose landing gear collapsed. The aircraft skidded on it's belly and came to a halt in kutcha. Both the occupants escaped unhurt. There was no fire and no injury to any person on ground.

1.2 Injuries to persons.

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	Nil	Nil	Nil
SERIOUS	Nil	Nil	NIL
MINOR/None	1	1	

1.3 Damage to aircraft.

The aircraft sustained damage mainly to landing gears and engines.

1.4 Other damage : Nil.

1.5 Personnel information:

1.5.1 Pilot – in – Command:

AGE	:	66 years (07/3/1943)
Licence	:	ALTP No. 1294
Date of Issue	:	22/07/1986
Valid up to	:	08/01/2010
Category	:	Aeroplane
Class	:	Multi Engine- land
Endorsements as PIC	:	open rating below 5700Kg
Date of Med. Exam.	:	18/03/09
Med. Exam valid upto	:	17/09/09
FRTO Licence No.	:	3203
Date of issue	:	22/07/1986
Valid up to	:	08/01/2011

Total flying experience : 11601.9 hours

Experience on type : 230 hours approx.

Experience as PIC on type : 230 hours approx.

Last flown on type : 25/8/2007

Total flying experience during last 90 days	:	18.9Hrs.
Total flying experience during last 30 days	:	18.9Hrs
Total flying experience during last 07 Days	:	Nil
Total flying experience during last 24 Hours	:	Nil

1.6 Aircraft information:

1.6.1 The aircraft was manufactured by M/s Cessna Aircraft Company, Wichita USA in the year 1975. It is powered with two continental Turbocharged GTSIO-520H, 6 cylinder engine, rated 375 H.P horsepower at 2275 RPM. The engine drives, three blade constant-speed, full feathering 90-inch McCauley propellers. The landing gear on the model is tricycle-type, fully retractable and electrically powered. The trim tabs located on the right elevator, left aileron, and the rudder is provided to aid in flight adjustment. It also has split-type electrically-operated wing flaps to aid in landing. There is only one door in the aircraft for the passengers. The air stair entrance door is hinged at the bottom. It swings out and down when opened. A stairway built into the inboard side of the door facilitates entry to the airplane. The aircraft has a total endurance of about 4 hours. Scrutiny of the Airframe and Engine log books of the aircraft revealed that on the day of incident, the aircraft had done 7448:20 airframe hrs since new and 00:00 hrs since the renewal of last Certificate of Airworthiness (C of A). The port engine had logged 791:25 hrs since new and 409:35 hrs since last overhaul. The starboard engine had logged 740:30 hrs since last overhaul and 452:30 hrs since new.

The overhaul for both the engines was due on calendar basis on 27/8/2008 since the overhaul life for the engines is 1200 Hrs/12 years. The last C of A was done on 25/8/07 and was valid till 24/8/2008. The aircraft was registered under private category.

1.6.2 The aircraft however did not fly after the issue of C of A on 25/8/2007. However all the maintenance schedules were been carried out on the aircraft

regularly. After the expiry of C of A on 24/8/2008, the schedules were still been carried on the aircraft with engine preservations and the entries were made in the logbook.

Since the C of A was not valid, a quantum of work required to carry out on the aircraft to make it air worthy was approved by DAW, Mumbai and was carried out along with the highest inspection schedule (100 hrs schedule) on this aircraft on 19/3/2009 at Indore. Thereafter a special one time ferry flight permission was obtained from DAW, Mumbai on 20/3/2009 to ferry the aircraft from Indore to Shivpuri on 21/3/2009. Scrutiny of the snag register reveled that there was no snag on the aircraft since the aircraft had not flown since the issue of C of A on 25/8/2007.

1.6.3 Scrutiny of the aircraft records further revealed that all the mandatory modifications on the aircraft were found to be complied with during the renewal of Certificate of Airworthiness on 25/8/07.

1.6.4 Scrutiny of the aircraft technical log book revealed that the aircraft was holding valid Flight Release Certificate which was issued on 19/3/2009 after carrying out all inspection schedules. However prior to flight no Daily Inspection schedule was carried out on 21/3/2009 as no qualified AME was available and the pilot was also not approved to carry out the same.

1.7 Meteorological information:

The weather at departure from Indore was fine with visibility 5000 meters with winds 050/04 knots with clear skies. The enroute weather and the weather at Shivpuri were reported to be fine.

1.8 Aids to navigation:

Shivpuri is an uncontrolled airfield. Other than the windsock, there is no other Navigational aid available at the airfield.

1.9 Communications:

There is no ATC facility available at Shivpuri. The last communication (on mobile with passenger) was with Bhopal ATC 30 Nm outbound Bhopal and the aircraft was advised to land at Bhopal due Radio Communication Failure. However the aircraft did not respond to the ATC call and continued flight to Shivpuri.

1.10 Aerodrome information.

Shivpuri airfield is an uncontrolled airfield and has runway orientation of 09/27. It is 2800ft long and 50 ft wide. The airfield is owned by State Government. There is no MET and ATC facility available at Shivpuri. There are no shoulder markings on the runway and the threshold markings are available on both side. Safety Services like the fire fighting vehicle and medical Ambulance to handle any emergency during aircraft operation are not available at the airfield.

1.11 Flight recorders: Neither fitted nor required.

1.12 Wreckage and impact information.

During examination of the aircraft at site, it was observed that Aircraft was resting on the ground on its belly on Left side at the end of Runway 09. LH Main Landing Gear with wheel assembly sheared from both trunnion attach bolts and fallen about 110 ft below the location of the aircraft. The LH propeller, all 3 blades bent backward from about 12 inches from tip end. The Nose landing gear remains collapsed and folded inside Nose Wheel Well. The LH wing tip fuel tank dented on the bottom with a few rivets sheared. The RH propeller pulled out from its mounting bolts and lying near Centre wing with all 3 blades bent. The

RH Main Landing Gear with wheel assembly sheared from both tunnion attach bolts and resting on the top of RH Horizontal Stabilizer. The RH Horizontal Stabilizer and RH Elevator tip ends damaged. The LH Elevator tip end and LH Horizontal Stabilizer tip damaged. All four landing flaps are in 'UP' position. LH Aileron Tab, Rudder Tab and RH Elevator Tab are in 'Neutral' position. The undersurface of the fuselage and undersurface of both Main Wings damaged and dented with cracks.

In the cockpit, the throttle levers were found to be in the idle position, masters was found off and the cockpit was secured indicating that the engine were shut down. The circuit Breakers for both right and left alternator were found out. The electric failure occurred due to draining of the aircraft battery since the alternators could not charge the battery and the battery drained out and eventually lead to electrical failure. In case of any one of the alternator failures the Amber indication comes in the cockpit and the other alternator is capable to charge the aircraft battery during flight.

1.13 Medical and pathological Information:

There was no preflight medical carried out prior to the flight as the aircraft is registered under private category.

Both the cockpit crew evacuated the aircraft safely after the incident and there was no injury to both the occupants.

1.14 Fire:

There was no fire.

1.15 Survival aspects:

The incident was survivable.

1.16 Tests and research: NIL

1.17 Organizational and management information:

M/s Chetak Aviation is a Flying Training Academy at Aligarh and is approved by Director General Civil Aviation, New Delhi. Presently the academy owns four aircrafts, one Cessna 172 R and two Cessna 152 for imparting training to the students. Cessna 421 aircraft is the forth aircraft which was involved in the said incident and is registered under Private Category.

1.18 Additional information:

1.18.1 The pilot was above the age of 65 years and was operating flight under a ALTP license which is not as per the regulations. As per rule 28 A the ALTP is only renewed up till the age of 65. Above the age of 65 the pilot can only use the privileges of Pilot Private License.

1.18.2 Further it was also observed that the pilot was qualified on Cessna 412 aircraft, but had no recency on the aircraft as he had not flown this aircraft for about 18 months. As per DGCA Operation Circular 2 of 2004, recency requirements for Pilot-in-Command operating aircraft having all up weight not exceeding 5700kg states that if the pilot has not flown the aircraft for more than 12 months, he requires to under go Ground Refresher on Technical/performance with qualified AME covering aircraft systems, pilots Flight Manual, Emergency and Abnormal situations and shall make an endorsement to this effect in the pilot's log book. Thereafter, the pilot shall under go Familiarization Flying Training by day or night of duration of not less than 00:45 hours followed by skill test by day and by night with DGCA approved Examiner on type. The skill test shall also include 3 take off and landing each by day and by night. Prior to operating the flight, the involved pilot had not undergone the recency requirements as laid down in the said DGCA Operation Circular.

1.19 Useful or effective investigation techniques: NIL

2. ANALYSIS

2.1 Serviceability of the aircraft:

2.1.1 The aircraft was manufactured by M/s Cessna aircraft Company Wichita, USA in the year 1975. The aircraft was issued with Indian Certificate of Registration (C of R) no.2756 on 31/5/96 under category 'A' in the name of M/s Dew Point Air and Systems Engineering, Pune on 31/5/96. The aircraft was re-issued C of R no. 2756/3 under category 'A' in the name of M/s Hindustan Academy of Aircrafts, Lucknow. It also held valid Indian certificate of Airworthiness no. 2244, which was initially issued on 31/5/96 under category Normal, Sub-Division Private. The Certificate of Airworthiness (C of A) was revalidated on yearly basis. The last C of A renewal was done on 25/8/07 and was valid till 24/8/08.

The aircraft was brought to MP Flying Club, Indore in the month of Feb 2007 in dismantled condition by road from Lucknow for its assembly and carrying out its C of A. After completion of the work in August 2007 and successful completion of C of A test flight, C of A was renewed by CAW office –Bhopal for one year. The test flight for C of A was carried by the same pilot who was involved in the said incident. Thereafter even though the aircraft was not flying, the ground run and engine preservation on the aircraft was being carried out.

Since the Certificate of Airworthiness had expired QCM Indamer, who held valid AME license on the aircraft was called from Mumbai for deciding quantum of work to be carried out and certify the aircraft in order to make a one time ferry flight to Shivpuri for positioning the aircraft. He carried out the necessary highest inspections schedules in addition to allied quantum of work after obtaining approval from Director Airworthiness (DAW) Mumbai. On 19/3/2009 the AME gave three times engine ground run up in order to ensure serviceability of the engine and related systems, once satisfied that there was no evidence of any kind of problem from engine and airframe he issued Flight Release

Certificate to the aircraft. Thereafter the ferry flights permission was given by DAW Mumbai. The AME did not give any familiarization training to the pilot.

On 21st March 2009 morning the pilot came to the MPFC and carried out the engine ground run up for about 20mins. After ground run, he did not report any problem and after being satisfied informed the AME that he will carry out the ferry flight to Shivpuri. Prior to flight the aircraft was holding valid Certificate of Flight Release but there was no Daily Inspection carried out on that day since no qualified AME was available. Also the involved pilot was not approved to carry out Daily Inspection schedule.

2.1.2 Examination of the aircraft wreckage at the site revealed that it was confined around its final rest position. There was no in-flight disintegration of any part of the aircraft. Both the main landing gear had disintegrated from the aircraft and were lying next to the aircraft. The nose landing gear had folded up. Both the propellers had broken and were lying next to the aircraft engines. In the cockpit all the switches and levers were secured. However it was observed that both the circuit breakers for the alternators which charge the battery during the flight were out. Once the alternators are not charging the battery, the battery will drain early since the flap retraction and landing gear retraction on this aircraft is electrical which draws heavy current. Approximately 20 minutes after take off the battery drained out and electrical failure occurred on the aircraft. As checked from records a new battery was installed on the aircraft before the flight.

In view of the foregoing, it is inferred that the pilot accepted the aircraft for flight without the daily inspection having done by the appropriately licenced AME/approved person.

2.2 Weather:

Before departure from Indore the weather was fine with visibility 5000 meters and winds 050/04 knots. The enroute weather was reported to be fine with no significant changes. The weather at Shivpuri was fine and is not a contributory factor to the incident.

2.3 PILOT'S FAMILIARIZATION ON TYPE:

The pilot had a total flying experience of 11,600 hrs and approx. 250 hrs as PIC on type. He had last flown the aircraft on 25/8/2007 during the test flight for the renewal of C of A at Indore. Thereafter he had not flown this type of aircraft and the incident flight was his next flight after the gap of about 18 months. As per DGCA operation circular 2 of 2004, if the pilot had not flown the type rated aircraft for more then 12 months then he requires familiarization with the AME before operating the flight and entry for the same is to be endorsed in the pilot flight log book and also a familiarization training flight along with the DGCA approved type rated pilot for recency and an entry endorsed in pilot flight log book before operating the flight.

The involved pilot before operating the flight neither did any formal familiarization training along with the AME nor did he do any recency flight along with a type rated DGCA approved pilot before operating the incident flight. Since the pilot had no recency on the aircraft and was operating after a gap of around 18 months, in all probability did not push in the alternators CB during cockpit preparation and later did not notice the light on the panel as it does not have any aural warning, resulting into draining of the battery during the flight followed by electrical failure.

It is therefore opined that recency of the pilot on the type of aircraft is a factor to the incident.

2.4 Pilot handling of the aircraft:

The pilot after obtaining the ATC and MET briefing took off for Shivpuri. The weather at Indore was reported to be fine with visibility 5000 meters with winds 050/04 knots with clear skies. Since Shivpuri is an uncontrolled and VFR airfield, it does not have any MET facility therefore the weather estimates for Shivpuri was reported to be fine with no significant changes in visibility by Indore ATC.

As per ATC tape transcript, VT-DEW was cleared to Shivpuri VIA W10 BPL BILAN flight level 55 departure runway 07 turn right climb on track initially maintain 4000ft, which was acknowledge by the aircraft. At 0456 UTC the aircraft had reported position at 20 DME out of IID (Indore Hold) and maintaining flight level 55. Indore ATC had instructed the aircraft, to report when in contact with Bhopal tower and the same was acknowledge by the aircraft. At 0503 UTC the Indore ATC called the aircraft to report position but there was no reply. The aircraft was repeatedly given call for 6 to 8 times but there was no response. At 20Nm outbound Indore, the pilot had noticed low voltage light on the instrument panel. He immediately reduced the electrical load and continued the flying toward destination with the assistance of hand held GPS. On getting no response from the aircraft, the Indore ATC immediately informed the Bhopal tower and Mumbai FIC about Radio Communication failure of the aircraft. The Bhopal ATC also made number of calls to the aircraft but there was no reply from the aircraft. Indore ATC relayed calls to the aircraft from over flying aircraft but there was no reply. At 0532 UTC the pilot asked the passenger who was having a mobile to contact the ATC Bhopal and informed that they were 30 Nm outbound Bhopal and the radio transmitter of the aircraft had failed and they had lost the RT communication. The tape transcript of ATC Bhopal revealed that it

had advised the aircraft not to continue the flight to Shivpuri and land at Bhopal due Radio Communication failure. The aircraft did not reply to the ATC Bhopal and continued the fight to Shivpuri.

During approach and landing on runway 09 at Shivpuri, the aircraft floated a bit and landed about 800ft from the beginning of runway 09. As per the Flight manual with full landing flaps of 45 degrees the runway length required to stop the aircraft is around 2200ft. Though the manual does not mention about the flapless landing but the runway length required is more since the approach speed is 15-20 knots higher than the normal approach speed in case of flapless landing. As the total runway length available at Shivpuri is around 2800 ft and with 2000ft runway available after touch down it was below the minimum required runway length for the aircraft to stop on the runway. The pilot applied maximum braking immediately after touch down to stop the aircraft within the remaining runway length. At about 150 ft remaining from the runway end, the aircraft swung toward the left of center line probably due to pilot action and left the runway surface and entered into kutcha and got damaged.

The Indore ATC Tape Transcript revealed that at 0610 UTC the pilot reported through mobile that it had landed safely at Shivpuri nearly 07 minutes back and they were experiencing communication failure due battery problem. Even though the aircraft was involved in an incident at the time of landing and went off the runway into kutcha, the same was not communicated to the ATC by the pilot.

The pilot had last flown this aircraft on 25/8/2007 during C of A renewal and had not flown this type of aircraft till the date of incident. Even though he had not flown this aircraft for about 18 months, he did not undergo any technical refresher training from AME nor he did the flying training with DGCA

approved instructor/examiner as required by DGCA Operation Circular 2 of 2004 prior to under taking this flight. The pilot had no receny on the aircraft.

From the foregoing, it is evident that due to lack of recency the pilot left the alternators circuit breaker out during the cockpit preparation, with the result the alternators did not charge the battery during the flight and subsequently the electrical failure occurred. Further he failed to initiate Go Around even when he was aware that he had touchdown late on the runway and the remaining length was not adequate to make a safe landing. Hence pilot handling of the aircraft is a contributory factor to the Incident.

2.5 Circumstances leading to the incident :

The aircraft was engaged in Ferry flight from Indore to Shivpuri. There was also one passenger on board the aircraft. Since Shivpuri is an uncontrolled airfield, it does not have any MET facility therefore the weather estimates for Shivpuri was reported to be fine with no significant changes in visibility by Indore ATC. After the ATC and MET briefing, the aircraft took off from Indore for Shivpuri.

The pilot during the cockpit preparation forgot to ensure that both the alternator circuit breakers were not in. As a result during the course of flight the aircraft battery draining out. 20Nm outbound Indore the pilot noticed low voltage light on the instrument panel, he immediately reduced the electrical load and continued the flying toward destination not realizing that this was due to alternator circuit breaker left out.

Descending into Shivpuri, the pilot carried out the manual extension for landing gears but the speed was high since he was executing a flapless landing.

Further the pilot failed to carry out local circuit in order to have a better judgment of the airfield, as this was a short airfield.

During landing since the approach speed was high, the aircraft floated a bit on the runway and landed late on runway 09. The pilot applied maximum braking immediately after touch down but the remaining length of the runway was not sufficient to stop the aircraft on the runway. At about 150 ft remaining from the runway end the aircraft swung toward the left of centerline probable due to pilot action and exited the runway surface into kutcha and sustained damage.

3. CONCLUSIONS:

3.1 Findings:

a) The Certificate of Airworthiness of the aircraft was not valid on the date of incident.

b) Since the aircraft was to be positioned at Shivpuri. After carrying out the mandatory/ highest inspection schedule on the aircraft, one time ferry flight permission was obtained from DAW Mumbai to ferry the aircraft from Indore to Shivpuri, as it did not have valid Certificate of Airworthiness.

c) The Pilot was above the age of 65 and was operating the flight under a valid ALTP which is non conformance of aircraft rule 28A.

d) The pilot accepted the aircraft for flight even though no Daily Inspection schedule was carried out on the aircraft on that day.

e) The pilot did not have recency on the aircraft since he had not flown the aircraft for last 18 months which is non conformance of Operation Circular 2 of 2004.

f) The pilot, during cockpit preparation forgot to push 'IN' the alternator circuit breaker as a result the battery did not get charged during the flight and drained out, which resulted into electrical failure.

g) The pilot accepted one passenger in the cockpit, who was not required for the operation of this ferry flight.

h) Twenty minutes after take off, the aircraft encountered electrical failure but he did not return back to Indore and continued the flight.

i) The Bhopal ATC advised the aircraft not to continue the flight to Shivpuri and land at Bhopal, the pilot did not respond and continued the flight.

j) Shivpuri airfield is an uncontrolled airfield and other than the wind sock there is no other facility available at that airfield. The runway length available at Shivpuri is 2800 ft.

k) The pilot did manual extension of landing gear and initiated a flapless landing on the short airfield with high approach speed.

l) During landing, the aircraft floated and landed about 800ft from the threshold of runway 09 and the remaining length was not sufficient to stop the aircraft on the runway.

m) The pilot should have initiated go-around instead of landing.

n) About 150 ft remaining from the runway end, the aircraft swung toward the left of center line probably due to pilot actions and exited the runway from the left and went into the kutcha.

o) Weather was fine and is not a factor to the incident.

3.2 Probable cause of the Incident:

Flapless approach with high speed and late touchdown due floating on runway resulted in aircraft not stopping on the runway and going into kutcha.

The lack of recency of the pilot on the type and continuing flight after electrical failure were contributory factors.

4. SAFETY RECOMMENDATIONS:

1. Appropriate action against the pilot for the lapses brought out in the report.
2. Appropriate action against the operator as per the findings brought out in the report.
3. An Air Safety Circular may be issued to highlighting the importance of pilot to have recency before operating flight.

Sd/-
(A.X.Joseph)
Senior Air Safety Officer(E)
Inquiry Officer (VT-DEW)

Place: Mumbai
Date:29/10/2009