FINAL INVESTIGATION REPORT OF ACCIDENT TO M/S NORTH EAST SHUTTLES PRIVATE LIMITED CESSNA CARAVAN 208B AIRCRAFT VT-NES AT LENGPUI AIRPORT ON 04.05.2011.			
	Aircraft		
		Type	Cessna Caravan 208B
		Nationality	Indian
		Registration	VT-NES
2	Owner		Cessna Finance corporation 100N Broadway suite 600 Wichita Kansas-67202-2206.
3	Operator		North East Shuttles Private Limited Surjya Road, Agartala-799001, Tripura.
4	Pilot – in –Command		Foreign License Holder with valid FATA.
		Extent of injuries	Minor/None.
5	No. of Passengers on board		09
	Extent of Injuries		Minor/None.
6	Last point of Departure		Imphal Airport.
7	Intended landing place		Lengpui Airport.
8	Place of Accident		LengpuiAirport. N 23 50 16.88 E 092 37 36.38
9	Date & Time of Accident		04.05.2011; 1045 Hrs IST approx.
All Timings are in IST			

SYNOPSIS

Cessna caravan 208 B aircraft VT-NES operated by M/s North East Shuttles Private Limited was involved in a runway overrun accident at Lengpui airport while landing on 04.05.2011 at approx 1045 Hrs IST.

The aircraft was operating a non scheduled flight Imphal–Lengpui with ten persons on board including one crew member. The aircraft took off normally from Imphal at 1000 hrs and subsequently came in contact with ATC Lengpui at 1023hrs. ATC Lengpui conveyed the latest available weather with visibility as 4500m. The pilot requested special VFR and the same was approved by tower controller. Visibility further dropped to 2000m and the pilot preferred holding, in coordination with ATC at 10 miles maintaining visual separation with terrain at an altitude of 6500 feet. The Pilot thereafter without any communication with ATC reported downwind for RWY 17 and subsequently reported for final. When the aircraft reported final, the controller after sighting the aircraft gave the landing clearance with wind as calm and RWY surface wet.

The aircraft touched down well ahead of the landing threshold at a high speed with a remaining distance in which it was impossible to stop the aircraft. The aircraft could not stop within available length of runway and it climbed a 10 feet high platform constructed to install the Localizer antenna at the end of RWY 17. As the speed of the aircraft was high, it continued past the localizer platform and fell in a ravine approximately 60 feet deep.

The accident occurred during day time. The occurrence was classified as an accident. The Ministry of Civil aviation ordered the investigation by appointing Committee of Inquiry under rule 74 of the Aircraft Rule 1937

vide order no AV.15018/03/2011-DG dated 23rd June 2011 to determine the cause and contributory factors leading to the accident. The committee issued a public notification in the leading news papers of Mizoram for seeking related information from the public if any.

The aircraft suffered substantial damage. However, all the 9 passengers and the pilot on board the aircraft escaped unhurt. There was no sign of pre/post impact fire.

1. FACTUAL INFORMATION.

1.1 History of flight

Cessna Caravan 208 B aircraft VT-NES owned by Cessna Finance corporation 100N Broadway suite 600 Wichita Kansas-67202-2206 and operated by M/s North East Shuttles Private Limited, Surjya Road, Agartala-799001, Tripura is registered to operate under passenger category and endorsed on the operators permit bearing Non Scheduled Operators Permit (NSOP) No 28/2008.

The aircraft was planned to operate sector Lengpui – Imphal – Lengpui on 04.05.2011. A duly approved engineer carried out daily inspection at 0800 Hrs in accordance with approved Daily Inspection schedule and the aircraft was offered for day's operation with 408 Kgs of fuel on board. After satisfactory walk around inspection the pilot accepted the aircraft at 0830 Hrs. The first leg of the flight Lengpui to Imphal was uneventfully concluded at 0940 Hrs.

The pilot in command carried out the transit inspection at 0945 hrs for the next flight Imphal – Lengpui. The Pilot had valid transit inspection approval. Flight plan for the sector was filed to conduct the flight under VFR. ADC and FIC clearances were also obtained.

At 0958 hrs, the pilot asked engine start up clearance for Lengpui which was approved by ATC. At 0959hrs the aircraft was cleared to take off for Lengpui by route W83 maintaining maximum cruise level 8500 feet. At 1008 hrs the aircraft changed over to Silchar ATC and there was no abnormality reported by the pilot till then.

The aircraft reported to ATC Lengpui at 1023 hrs while 38 NM inbound and maintaining 8500 feet with estimated time of arrival as 1038 hrs. The tower cleared aircraft via 052 radial and transmitted the latest weather. The prevailing visibility reported was 4500m, however the pilot requested for special VFR and the same was approved by ATC advising the pilot to report 25 NM inbound. On subsequent reporting at 25 NM inbound at 1028 hrs, tower advised to descent visually and report at 15 NM. The visibility had dropped down to 2000m and the same was communicated to the pilot. Special met report issued at 1030 hrs was communicated to the pilot at 1031 Hrs while the aircraft was 17 NM inbound. ATC also reported CB overhead moving east. The pilot subsequently informed he would like to hold at 10 NM maintaining 6500 feet. As per the statement of the pilot, while in the hold the aircraft entered a CB and the pilot found it difficult to control the aircraft. The aircraft descended and came out of the CB at 3500 feet. The visibility towards Rwy 35 side was better and pilot requested for availability of the same for landing which was denied by ATC as R/W 35 is not approved for landing.

The pilot reported left hand downwind of Rwy 17 at 1043 hrs. The Pilot did not complete a standard visual circuit patterns as there was weather on downwind. He turned early on to the base leg and subsequently reported for final at 1044 hrs. Landing clearance was approved by tower at 1044 hrs with wind calm and runway surface wet. Aircraft approached with a higher speed than the normal and touched down well past the landing threshold.

The pilot was not able to stop the aircraft within left over length of runway and fell in a ravine approximately 60 feet deep at the end of runway breaking two Localizer antennas installed on approximately 10 feet high platform.

While plunging in the ravine the right wing strut hit a small tree which changed the direction of the aircraft and saved the aircraft from consequential damage and injuries to passengers and crew. The pilot shut down the engine by pulling out Fuel Shut Off lever and switched off the battery. He further assisted the rescue team in passenger evacuation.

The airport firefighting and rescue services waiting as a regular practice with one CFT at the road holding position of the runway reached the accident site and evacuated all the passengers.

All the nine passengers and the pilot escaped unhurt. However the aircraft sustained substantial damage. There was no sign of pre/post impact fire.

1.2 Injuries to persons.

INJURIES	**CREW**	**PASSENGERS**	**OTHERS**
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor/None	01	09	

1.3 Damage to aircraft:

The aircraft was substantially damaged.

1.4 Other damage:

Two of the Localizer antennas installed at the end of Runway 35 got damaged.

1.5 Personnel information

Pilot-in-Command:

Age	22 Yrs approx.
Licence	FATA 741/2010
Date of Issue	23.11.2010
Valid up to	31.07.2011
Category	Airplane Single Engine, Land
Endorsements as PIC	C208B Caravan
Date of last Med. Exam	FAA Medical on 04.02.2011
Med. Exam valid up to	03.02.2012
IR test done	01.08.2010
IR test due	31.07.2011
Total flying experience	1983:06 Hrs
Experience on type	316:20 Hrs
Total flying experience during last 90 days	143:00 Hrs
Total flying experience during last 30 days	44:15 Hrs

Total flying experience during last 07 Days	20:35 Hrs
Total flying experience during last 24 Hours	04:00 Hrs

Detailed scrutiny of license held by the pilot revealed that the Commercial Pilot License bearing Certificate No. 3504636 has been issued by FAA, USA on 22.02.2010.

The pilot has valid approval to carry out transit inspection

The pilot has not undergone Indian Class I medical examination as per provision laid down by Director General of Civil Aviation.

The Pilot also had commercial pilot license issued from Nepal Civil Aviation Authority bearing CPL (A) No 317 with endorsement as Co-Pilot on DO228. The License is valid up to 28.02.2012. IR is valid up to 31.08.2011. Pilots' medical as per Nepali regulation is valid up to 28.02.2012

Further scrutiny of documents revealed that his FATA was issued without meeting the requirements of 10 take offs and landings as laid down in prevailing CAR Section 7 Series G Part II dated 8th Oct 1999. Requirement laid down is

" *In case of aeroplanes below 5700 Kgs AUW and certified for single crew operations, the foreign pilot to be appointed as PIC is required to hold professional pilot license , with a total experience of 300 Hrs with recency on type and at least 10 take offs and landings after PIC endorsement within preceding 6 months of application."*

It was further observed that the PIC operating the aircraft which met with an accident did not meet the 100 Hrs PIC experience on type as per the requirements laid down for single pilot operation in CAR Section 8 Series A part I para 5; which states:

"No *operator may use any person nor shall any person serve as pilot in command for single pilot operation unless that person had at least 100 hours PIC experience on type and model of the aircraft to be flown and has met all other applicable requirements."*

It was also noticed that the Pilot was not cleared as per DGCA requirements laid down in Operations circular 6 of 2002, to operate in airports situated in hilly terrain**.** M/S NES did not ensure adherence to DGCA requirement before releasing pilots to operate commercial flights. The Ops circular 6 of 2002 requires that

"Route Qualification
In accordance with the above the PIC before operating the flight for the first time to hilly terrain should have flown minimum of two flights to and from the airfield as second pilot or on familiarization flights with other pilots who have experience of flying to that airport or area. There after he should have undergone one satisfactory route check with an Examiner or senior experienced pilot approved by the DGCA"

Scrutiny of the personal log book/aircraft records revealed that the pilot in command had not exceeded the flight duty time/flight time limitations laid down in the prevailing regulations.

1.6 **Aircraft information:**

1.6.1 Cessna 208B aircraft is an all-metal, high-wing, single-engine equipped with tricycle landing gear for general utility purposes. The airplane flight control system consists of conventional aileron, elevator and rudder control surfaces. Control surfaces are manually operated through mechanical linkage using a control wheel for the ailerons, elevators and rudder/brake pedal for the rudder. The airplane is equipped with dual controls for pilot and co-pilot. The airplane is powered by one Pratt & Whitney PT6A-114A power plant, a free turbine engine.

1.6.2 The Cessna 208B aircraft has been manufactured by Cessna Corporation, Post Box 7704, Wichita, Kansas-67277, USA in the year 2008. The aircraft bearing serial number MSN 2025 has been duly registered in India with effect from 10.10.2008 and allotted with registration VT-NES endorsed in the certificate of registration No. 3846. The aircraft is owned by Cessna Finance Corporation, 100N Broadway Suite 600 Wichita Kansas-67202-2206 and operated by North East Shuttles Limited, Surjya Road, Agartala-799001, Tripura, India.

The aircraft VT-NES has been issued with the Certificate of Airworthiness (C of A), bearing serial no. 5055 issued on 10.10.2008. C of A was issued on the strength of Export FAA C of A No. E233300 dated 19.08.2008 and valid up to 18.08.2013. Its C of A has the restriction of operation of the aircraft within Passenger category.

Minimum crew necessary allowed is ONE with maximum authorized all up weight 3970 Kg.

1.6.3 The Scrutiny of DGCA approved weight schedule revealed that the aircraft was last weighed on 13.10.2008 at New Delhi and certified by authorised AME. The Basic Weight of the aircraft is 2310.57 Kgs .Maximum all up weight allowed is 3970 Kgs and Maximum landing weight is 3856.62 Kgs.

The next weighing of the aircraft will be due after 5 years from the date of last weighment as per provision.

The Load and Trim sheet for the accident flight was filled in and CG was calculated. The TOW was 3829 Kgs and the CG was 195.3 inches which was within allowable take off weight and CG movement.

1.6.4 Scrutiny of Airframe logbook of the aircraft revealed that on the day of accident the aircraft had done 1079:46 Hrs and 1823 Landings.

The aircraft records further revealed that all the modifications on the aircraft were found to be complied with before undertaking the accident flight. The summary of maintenance carried out on the aircraft is as follows:-

13-10-2008 100 hrs inspection schedule

22-01-2009 400 hrs/6 months out of phase inspection schedule

09-05-2009 100 & 400 hrs. /6 months inspection schedule

28-08-2009 100,200,400 hrs & yearly inspection schedule

22-09-2009	Annual review of airworthiness
09-11-2009	100 hrs inspection schedule.
02-01-2010	100, 200 & 400 hrs. inspection schedule
13-03-2010	100 hrs inspection schedule
15-05-2010	100, 200 hrs inspection schedule
29-06-2010	100 hrs. inspection schedule
30-08-2010	200,100, 400 hrs, yearly & 2 yearly insp. schedule carried out along with compass swing and CPCP
22-09-2010	items and fuel sample test for MBT.
14-10- 2010	ARC/2010/09 issued by DAW valid till 13-10-2011
26-12-2010	100 hrs inspection schedule
18-02-2010	100 & 200 hrs inspection schedule
19-04-2010	100 hrs inspection schedule

1.6.5 Scrutiny of Radio logbook revealed that the aircraft has a valid aero mobile license valid till 31-12-2011. Aircraft is fitted with:-

Audio Panel (GMA-1347)

Duel integrated Avionics Unit GIA63W

ILS, Localizer glide path & marker receiver

VOR Receiver

GPS Receiver

ADF (KR-87)

DME (KN-63)

Radio Altimeter (KRA 405BJ)

ATC Transponder(GTX33)

Weather Radar(GWX68)

TAS Processor (KTA810)

ELT(Artex ME 406)

1.6.6 Scrutiny of engine logbooks revealed that the aircraft is powered by P&W PT 6A-114A Engine and has completed 1079:46 Hrs.

As per record no modifications were due to be carried out before the accident flight.

1.6.7 Scrutiny of engine propeller logbook revealed that the aircraft is fitted with three bladed Mc Cauley propeller and has completed 1079:46 Hrs; No modification was due to be carried out before the accident flight.

1.6.8 Scrutiny of the aircraft records further revealed that all the modifications/inspection on the aircraft were found to be complied with before undertaking the accident flight.

1.7 **Meteorological information:**

The aircraft departed from Imphal at 1000 IST. Weather report given by Met Department did not reveal any significant weather and VFR conditions prevailed. Weather report for 1000 Hrs was Wind Calm, Visibility 7Km, Cloud SCT 2000 Ft, SCT 10,000 Ft, QNH 1012HPA, Temp 27ºC, Dew Point 18ºC

ETA of the aircraft VTNES at Lengpui was 1040 IST .The Met report issued at 0930 IST revealed wind360/02Kts,Visibility 5000 Meters, Weather HZ, Cloud SCT 2000, BKN 10000 Feet, QNH 1009 HPA, Temp 24ºC, DP 20ºC

Met Report issued at 1000 Hrs revealed Wind 050/3 Kts, Visibility 4500M, Weather HZ, Cloud SCT 2000Ft, FEW 2500Ft, BKN 10000 Ft and CB to North, QNH 1009 HPA, Temp 27ºC, DP20ºC

Special Met report was issued at 1030 Hrs with Wind 020/3 Kts, Vis 2000 M, Weather FBL TS, Clouds Few 1000Ft, SCT 1600Ft, FEW 2500 Ft, BKN 10000 Ft, QNH 1009 HPA, Temp 27ºC DP 21ºC

Met Report at 1100 Hrs revealed Wind 360/2 Vis 2500M, Weather HZ, Clouds FEW 1000 Ft, SCT 1800 Ft, FEW 2500Ft, BKN 9000 Ft, QNH 1010 HPA, Temp 25ºC, DP 23ºC

Met observatory stationed at Lengpui airport provides current weather only. There is no facility available to give weather forecast.

1.8 Aids to navigation:

Aircraft was equipped with ILS, DME, NDB, VOR and GPS to aid in navigation.

Airport is equipped with NDB and DVOR and DME. It has a published VOR DME circle to land approach for RWY 17 with a minima of 3600m for this category of aircraft (refer Fig 2)

ILS for RWY 17 has been installed in 2008 however it has not been made operational as yet.

1.9 Communications:

The aircraft is equipped with VHF Transreceiver. The airport is equipped with VHF for pilot controller communication which was functioning at the time of accident flight.

1.10 Aerodrome information:

Airport at Lengpui is owned by State Govt of Mizoram and is licensed for public use by DGCA, Govt of India. Airport has been issued with license bearing number AL/PUB/1 dated 14th Jan 1999 and is valid up to 13th Jan 2013.

The General information recorded in the airport manual is as follows

Name	Lengpui Airport

Location Indicator	VELP
Aerodrome Reference Code	4C
UTC	+ 0530
Geographical Co-ordinates (WGS-84)	LAT 235016.88N LONG 923736.38E
Aerodrome Elevation	1398ft (425.92m)
Elevation of threshold RWY17	1374 ft (418.79m)
Elevation of threshold RWY35	1395 ft (429.19m)
RWY Slope	0.8% Longitudinal
Aerodrome Reference Temp	27º C
Magnetic Variation	0º 45' W (1985)
Aerodrome Beacon	Flashing green and red light is provided on top of Control tower.
Aerodrome Operator	Government of Mizoram
Address	The Airport Controller, GAD (Aviation Wing) Government of Mizoram Lengpui Airport - 796 410 Tel. No: 0389 - 2323582 Fax No. : 0389- 2322748
Airport Watch Hours	9:00 AM to 3:30 PM on week days

Aerodrome Dimensions and Related Information

Runways	
RWY	17 / 35 PCN 36/F/C/W/U
RWY Width	45 Metres
RWY Length	2500 Metres (8200 ft)

Runway End Safety Area (90Mts X 90Mts) is yet to be declared. RESA will be provided on RWY17 and RWY 35 side on completion of the proposed runway extension (Fig 1 shows no RESA).

Runways- Declared Distances

RWY BEARING TORA TODA ASDA LDA SLOPE

RWY	TORA (M)	TODA (M)	ASDA (M)	LDA (M)
17	NU	NU	NU	2500
35	2500	2500	2545	NU

Lighting

Approach Lighting System (High Intensity): Not provided

PAPI: Provided for RWY 17 with 2.98 degrees

Runway Lighting Aids (High Intensity): Provided

Taxiway Lights: Provided

Apron Flood Lights: Provided

Emergency Power Supply: Two DG Sets with a capacity of 250KVA each available.

The airport rescue and fire fighting category RFF Category CAT VII was maintained at the time of accident.

ILS equipment was installed in 2008 but not commissioned till date.

The present location of ATC does not permit full view of the runway17 towards the end because of high hillock between the ATC and runway.

Fig-1: View of the runway from RWY 35 with no RESA.

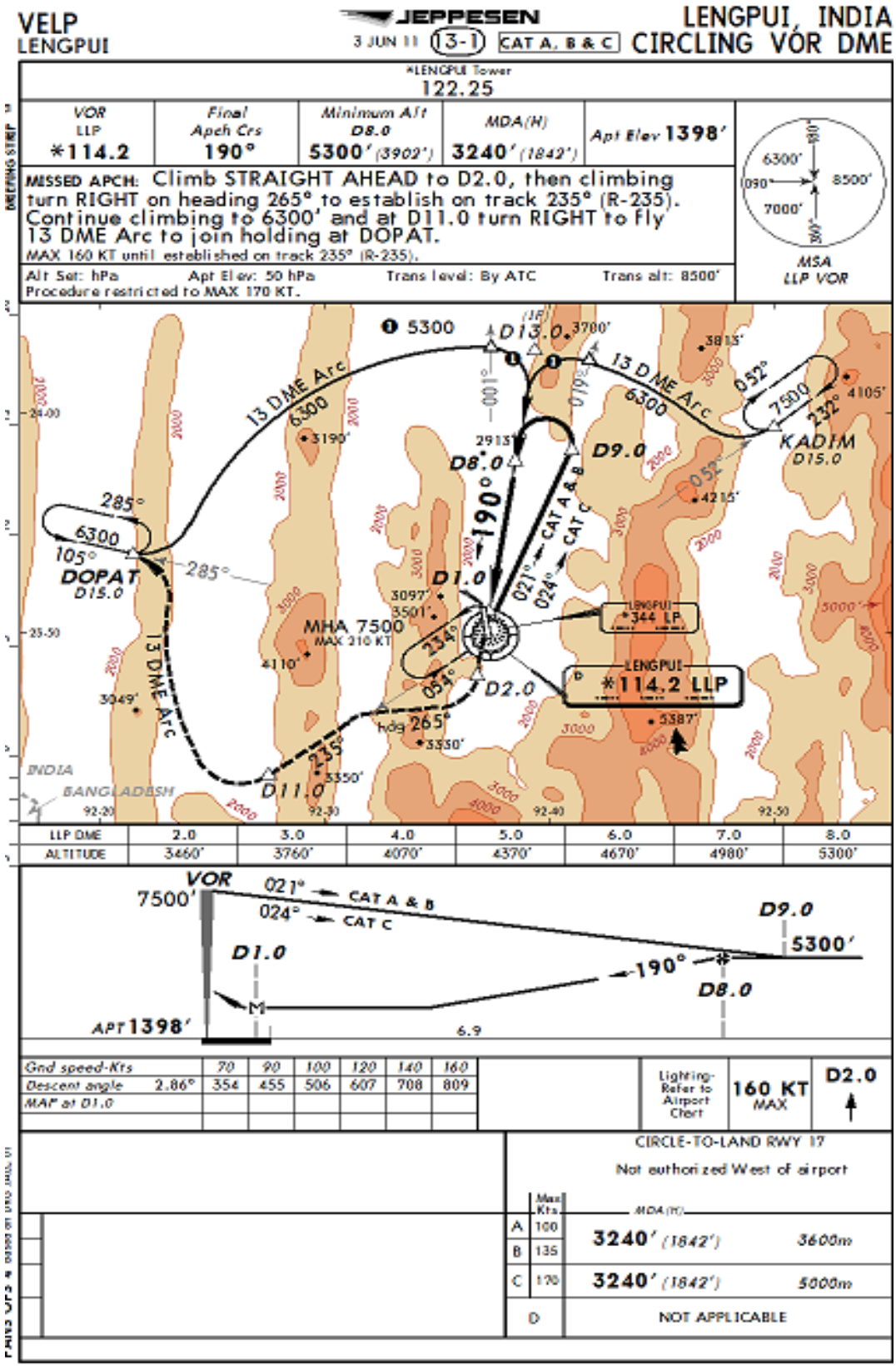


Fig-2: Published VOR DME circling approach.

1.11 **Flight recorders:**

Flight recorder was not installed as it is not required by regulation.

1.12 **Wreckage and impact information:**

The wreckage of the aircraft was found in the 60 feet ravine at the end of runway 17 (Ref Fig 3). No parts/component found disintegrated from the main wreckage of the aircraft, however the brief details of the damage sustained by the aircrafts are appended below:

RH Wing top attachment got distorted and wing strut damaged. RH Flap leading edge got damaged. LH wing attachment area aft side caved in the cabin (Ref Fig 4). LH wing was substantially damaged. LH wing strut totally damaged. LH aileron substantially damaged. All the three undercarriage were broken. Belly of the fuselage was ruptured Propeller blade totally damaged including spinner. Engine mounts were found broken and substantial damage found around exhaust and cowling area.

Recording in the analog type of airspeed indicator appear significant, the needle of which was stuck at approximately 92 Kts.

Fig-3: View of the wreckage seen from the top of ravine.

Fig-4: Broken undercarriage and caved in wing portion in the cabin.

1.13 **Medical and pathological Information:**

Pilot and the nine passengers onboard came out of the aircraft after the accident with minor/none injury. They were subjected to post medical examination and released after first aid. Post accident medical examination of the pilot revealed that he was not under influence of alcohol.

1.14 **Fire:**

There was no evidence of pre/post accident fire.

1.15 Survival aspects:

Due to delayed touchdown the pilot was not able to stop the aircraft within left over runway and fell in the ravine of approx 60 feet deep at the end of the runway 17 breaking two of the Localizer antennas installed on approx 10 feet high platform.

While plunging in the ravine, the right wing strut hit a small tree which changed the direction of the aircraft and saved the aircraft from consequential damage and injuries to passengers and crew. The pilot shut down the engine by pulling out Fuel Shut Off lever and switched off the battery. He further assisted the rescue team in passenger evacuation.

No search and rescue was required as the aircraft/wreckage was lying near the end of runway 17; however the airport firefighting and rescue services reached the site and evacuated all the passengers with the help of Pilot.

All the seats and seat belts were found in position and no damage to the seats were observed.

All the nine passengers and the pilot escaped unhurt.

1.16 **Tests and research:**

No test and research is required.

1.17 **Organizational and management information:**

The operator M/S North East Shuttles Private Limited has a valid permit to operate Non Scheduled Air Transport Services and is in possession of permit No 28/2008 .The operator has three aircrafts Cessna Caravan 208B VT-NES, Dornier 228-212 VT-NER and Dornier 228-201 VT-EIO endorsed on the permit.

The operator was issued with NSOP after the validation of their declared capabilities to operate within the laid down regulations in a duly constituted preparedness meeting.

The operator was found in possession of operations manual as per laid down norms.

It has been observed that the operator does not have emergency landing fields declared and the crew is not made aware of the same before undertaking the flight. The requirement for the same has been made in CAR Section 2 Series O part 1, para 5.1.2 which states;

"*For single engine aircraft operation there shall be emergency landing grounds at intervals of not more than 150 miles"*

The operator could not show any documents to substantiate that they have done necessary checks as required by DGCA for hilly terrain operations before clearing the involved pilot.

It has been observed that the operator had put up an application to DGCA for issuance of FATA without the pilot meeting the CAR requirement. It was further observed that the operator did not do release check as required by the CAR which states;

"*The foreign pilots whose license and ratings are validated under the provision of this CAR shall be released by the operator to function as a line pilot after being subjected to an assessment check for a minimum duration of two hours. Assessment check report to be submitted to DTL, DGCA"*

1.18 **Additional information:**

Nil

1.19 **Useful or effective investigation techniques**:

Nil

2. ANALYSIS

2.1 Serviceability/Maintainability of the aircraft:

2.1.1 Cessna Caravan 208B aircraft VT-NES was registered in India with effect from 10.10.2008 and allotted with registration VT-NES endorsed in the certificate of registration No. 3846. It has been issued with the Certificate of Airworthiness serial no. 5055 issued on

10.10.2008. The aircraft had valid C of A. The minimum cockpit crew required for operation is ONE with maximum authorized all up weight 3970 Kgs

The aircraft operation was well within the provision of valid C of A and C of R.

2.1.2 DGCA approved weight schedule revealed that the aircraft was last weighed on 13.10.2008 by Deccan Aviation Delhi. Weighing of the aircraft was not due as per DGCA regulation before the accident flight. The pilot in command had filled in load and trim (L&T) Performa before commencement of accident flight. The filled in performa in association with the passengers manifest has been analyzed and found that the aircraft was operating within the limit of maximum authorized takeoff and landing weight. The C.G for the accident flight was also calculated and found to be within authorised limit.

2.1.3 Airframe logbook, both engine logbooks, propeller logbooks and the radio logbook of the aircraft has been scrutinized and the records therein analyzed. The analysis of these documents revealed that no schedule inspections were due to be carried out before undertaking the accident flight. All the Mods/SBs were observed to be complied with. No snag was observed to be pending before the accident flight.

2.1.4 The Daily Inspection (DI) of the aircraft was carried out by appropriately approved engineer before undertaking the first flight of the day at Lengpui. Subsequent transit inspection at Imphal was carried out by the pilot having valid approval to carry out transit

inspection. Analysis of the records of aircraft journey logbook revealed that there was no snag recorded in the last sixty days which could be significant to the accident.

2.2 Airport Facilities

Airport at Lengpui is owned by State Govt of Mizoram and is licensed for public use by DGCA, Govt of India. The airport has been issued with license bearing number AL/PUB/1 dated 14th Jan 1999 and is valid up to 13th Jan 2013. The details as per the airport manual have been scrutinized and observed that it has a length of 2500 meters which meets the landing field length requirement of this category of aircraft. The Cessna Caravan 208 B LFL requirement at maximum landing weight is as follows

LFL Dry Runway (Factor 1.67) : 1553 Feet

LFL Wet Runway(Factor 1.92) : 1786 Feet

Runway does not have RESA which if available would increase the level of safety standard of the operations from the airport. As per DGCA CAR Section IV Series B part 1 RESA requirement is as follows

"Runway end safety areas- A runway end safety area shall be provided at each end of a runway strip.

Dimensions of runway end safety areas- A runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m. The width of a runway end safety area shall be at least twice that of the associated runway".

Runway 17 was equipped with ILS in 2008 but the same has not been commissioned till the date of accident. Also due to height of the control tower and the presence of a hillock in between, runway end is not visible from the tower. However non availability of ILS and runway end being not visible from the tower was not the contributory factor to this accident but this would increase safety standards of the airport.

2.3 Operational Aspect

The operating crew, the pilot in command had valid FATA in possession which was issued based on FAA license to operate Cessna Caravan aircraft. On scrutiny of the documents it was revealed that he did not meet the prevailing CAR requirement on issue of FATA. It was observed from his log book records that he did not have 10 takeoffs and landings as required by the CAR after his PIC endorsement in preceding 6 months before the issue of FATA.

M/S NES did not ensure that the applicant met the minimum CAR requirements at the time of submitting application for issue of FATA.

DGCA should have scrutinized the papers submitted by the operator in respect of involved pilot before issue of FATA. However it has been observed that DGCA failed to detect the flaws in the application form submitted by the operator and issued FATA without meeting the prevailing requirement. Neither did DGCA endorse any condition on the privileges of FATA to be exercised after meeting those requirements.

DGCA failed to detect the flaws in the application form submitted by the operator in respect of involved pilot for the purpose of issue of FATA.

After issuance of FATA by DGCA the operator was supposed to subject the pilot through an assessment check of two hours and send a report to DGCA. The operator failed to meet this requirement and did not send any such report to DGCA

The pilot was cleared by M/S NES to operate as PIC with single pilot operation without meeting the laid down requirement of having flown for 100 Hrs on type of aircraft.

The pilot was not adequately experienced before undertaking single pilot operation. The operator failed to ensure compliance to this requirement.

The pilot had the necessary approval to carry out transit inspection and the same was carried out before takeoff from Imphal.

The pilot in command did not undergo pre-flight medical examination as M/S NES has no facility for the same at Lengpui; however Post flight medical examination report revealed that he was not under the influence of alcohol.

The Pilot was not cleared as per DGCA requirement to operate in airports situated in hilly terrain. M/S NES did not ensure adherence to DGCA requirement before releasing pilots to operate commercial flights.

There was no dispatch procedure found to exist in M/S NES operations for ensuring that airports being operated meet landing field length requirement. It was also found that the Pilot of the accidental aircraft was not aware of the requirement of LFL**.** He had done no calculations to determine the LFL required for landing at Lengpui on a wet runway.

The pilot has not undergone Indian Class I medical examination as per provision laid down by Director General of Civil Aviation; however no evidence indicated any medical or behavioral conditions that might have adversely affected the pilot performance during the accident flight. There was also no evidence of flight crew fatigue. The accident airplane was duly certificated and was equipped, maintained and dispatched in accordance with industry practices. No evidence indicated any failure of the airplane's power plant, structures, or systems that would have affected the airplane's performance during the accident landing.

The pilot received weather information for Imphal, Lengpui and alternate airport from ATC. Pilot obtained numerous weather updates while en route. Therefore, it is evident that the pilots had adequate initial and updated weather information throughout the flight.

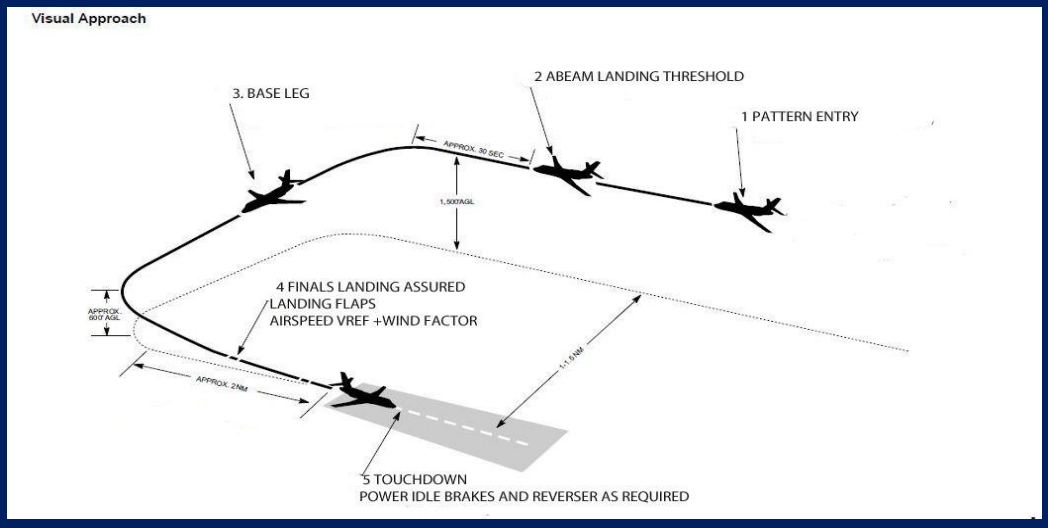
On the basis of ATC transcript it is evident that Lengpui tower personnel monitored weather conditions and passed timely information to the Pilot.

. As previously noted the pilot was aware of the inclement weather in the Lengpui area before and obtained updated weather information throughout. At no stage did the pilot decide to divert nor did he calculate his landing distance requirement for wet runway.

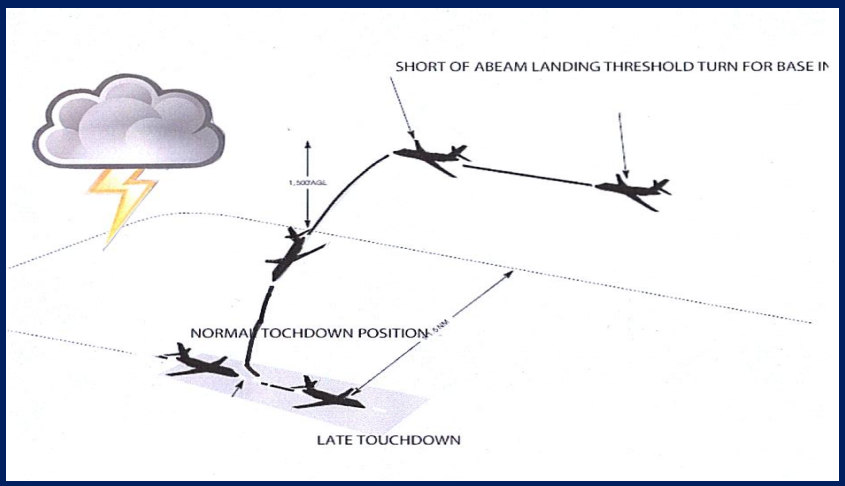
The pilot in his report admitted to entering a CB while holding 10 miles from the airport and the uncontrolled descend to 3500 feet. This descend was well below the MSA which is 8500 feet in IMC conditions with no visual reference to terrain. At no stage did he advice ATC and without reporting to ATC about setting course to Lengpui reported left hand downwind to the tower. It was also revealed during investigation that the Pilot while flying in areas reported with CB had his weather radar put on standby. On discussions with the pilot it was revealed that the Pilot had poor understanding on the use of weather radar and further jeopardized the safety of flight by his actions of flying in weather with weather radar on standby.

It is clear that seeing weather on downwind the pilot turned for base leg before reaching the end of the downwind leg, with this early turn by the time the pilot rolled out for finals he had crossed the landing threshold for runway 17. This non standard visual pattern resulted in the aircraft crossing the landing threshold high and fast. The aircraft touchdown took place well beyond the touchdown point of the runway at a higher than normal speed with a remaining distance in which it was not possible to stop the aircraft from overshooting.

STANDARD VISUAL PATTERN



NON STANDARD PATTERN FOLLOWED BY THE AIRCRAFT



The pilot did not adhere to a visual circuit pattern the airplane was not stabilized but the pilot at no stage considered a go-around and continued to land in an unsafe condition. The Pilot was also not aware of his landing distance requirement. M/s NES as an operator did not provide it's Pilot with clear and consistent guidance and training regarding company and DGCA policies and procedures in several areas, including calculation of Landing Field Length. Mandatory Go Around policies, weather Radar usage.

3. CONCLUSIONS:

3.1 Findings:

3.1.1 The pilot of VT-NES was unable to position correctly for a stabilized approach. As a consequence landed well ahead of the threshold with higher speed and overshot the runway length and fell into a ravine approximately 60 feet in depth. This happened due to poor skill level of the pilot.

3.1.2 The weather conditions were marginal but within permitted minima. However the pilot's inadequate experience on type and inadequate training affected his judgment and decision making ability. He chose to continue with the approach, which was grossly overshooting, rather than going around and following a missed approach procedure to divert or make another approach.

Pilot displayed poor airmanship. There was only one CB cell reported within aerodrome vicinity. He was however unable to negotiate the same and entered a dangerous weather phenomenon.

The aircraft had fully serviceable weather radar on board however the pilot did not utilize the same. He did not switch it on due to perhaps ignorance or incompetency to use the same.

The pilot was informed regularly about the weather at destination before and during the flight. He did not effectively utilize the weather information to plan the flight.

3.1.3 The Operator North East Shuttles displayed organizational deficiencies, in that;

a) The operator did not ensure that the applicant met the minimum regulatory requirements of having undergone ten take offs and landings after PIC endorsement in the last six months at the time of submitting application for issue of FATA. DGCA also failed to detect the flaws in the application form submitted by the operator in respect of involved pilot for the purpose of issue of FATA

b) After issuance of the FATA by DGCA the operator was required to subject the pilot through an assessment check of two hours and send a report to DGCA. The operator failed to meet this requirement and did not send any such report to DGCA.

c) The pilot was not meeting the regulatory requirement of having flying experience of 100 hours before undertaking single pilot operation. The operator failed to ensure compliance to this requirement.

d) The Pilot was not cleared as per DGCA regulation to operate in airports situated in hilly terrain. M/S NES did not ensure adherence to DGCA requirement before releasing pilots to operate commercial flights.

e) The pilot had not undergone Indian Class I medical as required by DGCA.

f) The operator does not have emergency landing fields declared and the crew is not made aware of the same before undertaking the flight as required by DGCA.

3.1.4 The availability of RESA would increase the safety margin in case of runway overrun.

Runway 17 end was not visible from the tower. Visibility of full length of runway from ATC tower would increase the level of safety standard for immediate action in case of emergency.

Equipment for Instrument Landing System has been installed but not made operational for the last few years. Availability of ILS would increase the level of safety standard.

3.2 C**ause of the Accident**:

The cause of the accident was inadequate skill level of the pilot to execute a safe landing during marginal weather condition.

4. **SAFETY RECOMMENDATIONS**:

4.1 The operator did not ensure that the applicant met the minimum regulatory requirements for the issuance of FATA. DGCA also failed to detect the shortcomings. DGCA may wish to review the process of issuance of FATA.

4.2 As per DGCA rules there is no requirement to conduct oral examination for pilots applying for FATA to fly aircraft below 5700 Kg. It may be prudent to include these pilots for oral examination as well.

4.3 VT-NES was being operated by single pilot. Considering that there are many areas in India where the terrain is difficult, the weather conditions unpredictable and facilities at airfields limited, single pilot requirement in these areas may be re-evaluated for commercial flights.

4.4 As commercial aviation expands into restricted and remote areas, smaller NSOP with limited resources and expertise are likely to emerge in greater numbers and rapidly. Therefore it may be necessary for DGCA to be more stringent and thorough during the initial issuance of operating permit to ensure that safety standards are not compromised.

4.5 The ILS installed at Lengpui has not been operationalised till the date of accident. This is not in the interest of flight safety and certainly requires such delays to be reviewed.

4.6 Met department at Lengpui may be upgraded to provide weather forecast also.

4.7 Presently the strength of Flight Operations Inspectors at DGCA is mainly manned by the representatives of scheduled operators. Increased participation of general aviation pilots as FOI for surveillance of NSOP operators needs consideration.

4.8 In view of various violations as listed at para no 3.1.3 of findings, DGCA may conduct a safety audit of M/s NES and monitor their performance regularly in the future.

4.9 Involved Captain of VT-NES may be put through corrective ground and flying training. Before validation of FATA it should be considered to put him through a DGCA oral examination.

4.10 It is recommended that "A Civil Aviation Authority" be commissioned which would have the following mandate.

a. Independent examining boards for Air Crew, Ground Crew and Cabin Crew.
b. Independent financial powers including powers to hire staff at prevailing commercial rates.
c. Independent functional control with the administrative control and under the Ministry of Civil Aviation.

4.11 Central government should setup an independent "Accident Investigation Bureau" in accordance with International Standards for investigations of accidents and serious incidents. Further the Accident Investigation Bureau should have financial and administrative independence.

4.12 DGCA may consider increasing manpower posted in the NE region for effective monitoring and control of operations in the region.

4.13 Defence procurement policy of year 2010 has been modified to include Commercial Aviation in the offset clause. This implies that defence offset investment could also be utilised to the optimal level in the Civil Aviation Sphere.

Capt Sanjay Verma
Member

Sh KB Batra
Member

Air Marshal (retd.) P.S. Ahluwalia
PVSM, AVSM & Bar, VM, VSM
Chairman