

**Final Investigation Report on**  
**Accident to M/s Prabhatam Aviation Pvt.**  
**Ltd., AS 350 B3 Helicopter VT- PED on**  
**21-06-2013 at Rambara, Near Kedarnath**  
**Shrine, Uttarakhand**



**COMMITTEE OF INQUIRY VT-PED**

(Capt. S K S Panwar )  
FOI (H), DGCA

( Amit Gupta)  
Deputy Director (AED), DGCA Hqrs.  
Chairman- Committee of Inquiry VT-PED

## ***Foreword***

*In accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO) and Rule 3 of Aircraft (Investigation of Accidents and Incidents), Rules 2012, the sole objective of the investigation of an accident shall be the prevention of accidents and not apportion blame or liability.*

*This document has been prepared based upon the evidences collected during the investigation, opinion obtained from the experts and laboratory examination of various components. Consequently, the use of this report for any purpose other than for the prevention of future accidents could lead to erroneous interpretations.*

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## Glossary

AED	Aircraft Engineering Directorate
AIP	Aeronautical Information Publication
AME	Aircraft Maintenance Engineer
AMSL	Above Mean Sea Level
ARC	Airworthiness Review Certificate
ATC	Air Traffic Control
AUW	Allowable All Up Weight
BITE	Built In Test Equipment
CAR	Civil Aviation Requirements
C of A	Certificate of Airworthiness
CFIT	Controlled Flight Into Terrain
CG	Centre of Gravity
CPL(H)	Commercial Pilot License (Helicopter)
CRM	Crew Resource Management
CVR	Cockpit Voice Recorder
DGCA	Directorate General of Civil Aviation
DGR	Dangerous Goods Regulations
DFDR	Digital Flight Data Recorder
DME	Distance Measuring Equipment
ECU	Engine Control Unit
ETA	Estimated time of Arrival
FOI	Flight Operations Inspector
FADEC	Full Authority Digital Engine Control
FRTOL	Flight Radio Telephone Operator's License
Kms	Kilometers
MGB	Main Gear Box
MHz	Mega Hertz
MGT	Measured Gas Temperature
NDRF	National Disaster Response Force
NSOP	Non-scheduled Operating Permit
PIC	Pilot In command
rpm	Revolution per minute
RTR (C)	Radio Telephony Restricted
SOP	Standard Operating Procedures
SHP	Shaft Horse Power
VEMD	Vehicle and Engine Multifunction Display
VHF	Very High Frequency
UTC	Co-ordinated Universal Time

<b>Final Investigation Report on Accident to M/s Prabhatam Aviation Pvt. Ltd. (PAPL) AS 350 B3 Helicopter VT- PED on 21-06-2013 at Rambara, Near Kedarnath Shrine, Uttarakhand.</b>			
1.	Helicopter	Type	AS 350 B3
		Nationality	Indian
		Registration	VT-PED
2.	Owner		M/s Prabhatam Aviation Pvt. Ltd., New Delhi
3.	Operator		M/s Prabhatam Aviation Pvt. Ltd., New Delhi
4.	Pilot – in –Command		CPL (H) Holder
	Extent of injuries		NIL
5.	Date & Time of Incident		21-06-2013; 0915 UTC.
6.	Place of Accident		Rambara, Near Kedarnath Shrine, Uttarakhand.
7.	Last point of Departure		Phata Helipad , Rudraprayag, Uttarakhand
8.	Intended landing place		Rambara, Near Kedarnath Shrine, Uttarakhand.
9.	No. of Passengers on board		NIL
10.	Type of Operation		Rescue Flight
11.	Phase of Operation		Landing
12.	Type of Accident		Controlled Flight Into Terrain (CFIT)
13.	Co-ordinates of Accident Site		Lat 30° 41' 31" N, Long 79° 03' 05 " E AMSL 8500 feet

(All timings in the report is in UTC)

## **SYNOPSIS:**

On 21<sup>st</sup> June 2013, M/s Prabhatam Aviation Pvt Ltd. (PAPL) AS 350 B3 helicopter VT-PED was engaged in rescue of pilgrims after flash floods from Kedarnath Ji Shrine and Rambara Helipad to Phata Helipad. Helicopter took off from Sehestra Dhara Helipad, Dehradun under the command of single pilot having CPL (H) with relief material and landed at Phata Helipad. Thereafter, helicopter carried out three (03) sorties from Phata to Kedarnath Ji Shrine and two (02) sorties from Phata to Rambara. While carrying out third (03) sortie, as helicopter landed there was sudden rush of unruly pilgrims toward helicopter trying to board helicopter at the same time. Pilot tried to take-off without passengers to avoid unruly pilgrims and in this process, main rotor blade hit the mountain cliff resulting in damage to main rotors and tail boom. Helicopter impacted ground and substantially damaged. The accident occurred at around 0915 UTC.

The Ministry of Civil Aviation constituted a committee of inquiry to investigate the cause of the accident under Rule 11 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2012 comprising of Sh. Amit Gupta, Deputy Director (AED) as Chairman and Capt. S. K. S. Panwar, FOI, DGCA as member of committee.

The Committee of inquiry determines the probable cause of accident as "During takeoff from temporary helipad by pilot to avoid sudden rush of unruly pilgrims, helicopter main rotor blades hit the mountain cliff resulting substantial damage to helicopter.

Improper construction and location of temporary helipad along with improper crowd control was contributory factor to the accident."

## **1. FACTUAL INFORMATION:**

### **1.1 History of Flight:**

On 21<sup>st</sup> June 2013, M/s Prabhatam Aviation Pvt Ltd., AS 350 B3 helicopter VT-PED was engaged in relief and rescue operations at Uttarakhand after flash floods. At Shahasdara helipad, Dehradun first flight inspection was carried out by AME and helicopter was released for flights at 0015 UTC. Helicopter took off at 0100 UTC for Phata helipad with relief material under the command of pilot having CPL (H) but returned back at Shahasdara helipad due poor visibility after 10 minutes of flight. Helicopter took off again from Shahasdara helipad at 0700 UTC and landed at 0800 UTC at Phata helipad along with relief material. Relief material was unloaded at Phata helipad and helicopter took off for rescue flight without switching off the engine.

Helicopter successfully carried out three (03) sorties from Phata to Kedarnath ji Shrine left helipad carrying supplies on the way up and evacuated 15 pilgrims to Phata on return flights. The 03 sorties took approx. 50 minutes flying time i.e. from 0805 UTC to 0855 UTC.

After that, the helicopter again took off from Phata at 0856 UTC to Rambara helipad and carried out two (02) sortie rescuing 08 pilgrims. While carrying out third (03) sortie, as helicopter landed there was sudden rush of pilgrims toward helicopter trying to board helicopter at the same time. Pilot tried to take-off without passengers to avoid unruly pilgrims and in this process, main rotor blade hit the mountain cliff resulting in damage to main rotors and tail boom. Helicopter rotated 90° and tail rotor also hit the mountain. The tail rotor assembly broke from tail boom. Helicopter impacted ground and was substantially damaged. There was no fire or injury. The accident occurred at around 0915 UTC. The pilot was later rescued by Indian Air Force helicopter. The crowd control at Rambara was carried out by National Disaster Response Force (NDRF) persons

along with 02 volunteers who were positioned at Rambara helipad by Indian Air Force helicopter.

### **1.2 Injuries to Persons :**

Injuries	Crew	Passengers	Others
Fatal	NIL	NIL	NIL
Serious	NIL	NIL	NIL
Minor/None	01	NIL	NIL

### **1.3 Damage to Aircraft:**

The helicopter was substantially damaged. Following main damages were observed on the helicopter:-

1. All (03) Main rotor blades and Main Rotor hub were damaged.
2. Main rotor shaft & main gear box were damaged.
3. Skid, cockpit, main body structure damaged.
4. Tail boom sheared off from the aft stabilizer and damaged.
5. Vertical fin and tail gear box sheared off.
6. Tail rotor blades damaged.

### **1.4 Other Damages : Nil**

## **1.5 Personnel Information:**

### **1.5.1 Pilot- in- Command**

AGE	43 yrs
License	CPL (H)
Date of License Issue and Valid up to	15-09-2011 to 14-09-2016
Category	Helicopter
Class	Single Engine Land
Endorsements as PIC	Robinson R-44 and AS 350 B3
Date of Joining Company	10-04-2012
Date of Endorsement as PIC on AS 350 B3	02-08-2012
Instrument Rating	Nil
Date of RTR Issue and Valid up to	02-06-2009 to 01-06-2014
Date of FRTOL issue & validity	03-08-2010 to 02-08-2015
Date of Med. Exam & validity	11-03-2013 to 10-09-2013
Date of last line/Route Check	14-03-2013
Date of Last Proficiency Check	05-03-2013
Date of English language Proficiency &	17-04-2011, Level '6'
Valid up to	Lifetime Valid
Date of last CRM	19-06-2013
Date of last Monsoon training	18-06-2013
Dangerous Goods Awareness Training	13-07-2012

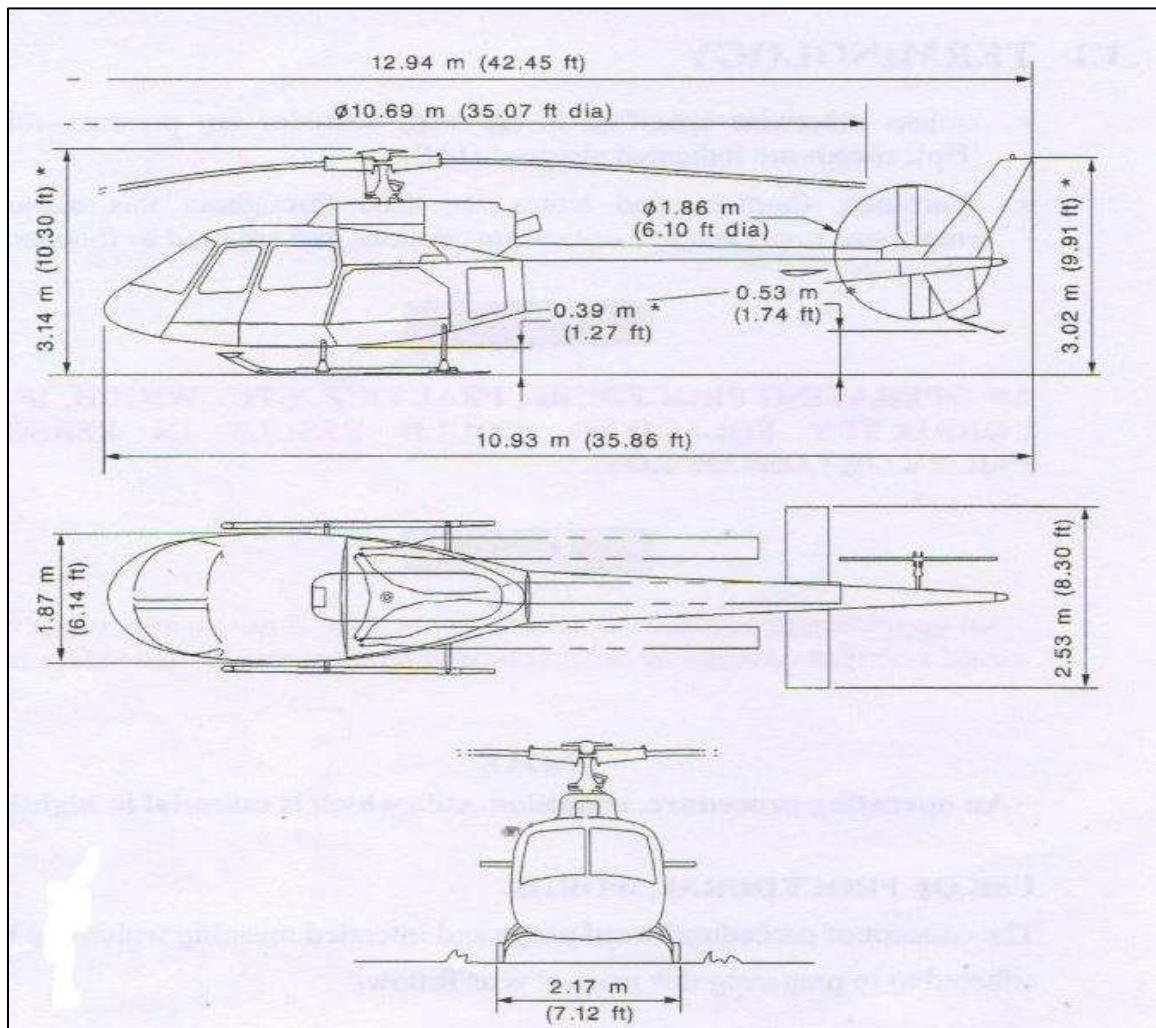
Date of last Refresher/Simulator	16-08-2012
Simulator Training for Critical Emergencies	Not carried out.
Familiarity with Route/ Airport flown for last 12 months and since joining the company.	Since September 2012
Total flying experience	2312:15 hrs
Total Experience on type	328:25 hrs
Total Experience as PIC on type	207:00 hrs
Last flown on type	AS 350 B3
Total flying experience during last 01 Year	344:55 hrs
Total flying experience during last 180 days	198:05 hrs
Total flying experience during last 90 days	124:55 hrs
Total flying experience during last 30 days	65:40 hrs
Total flying experience during last 07 Days	09:00 hrs
Total flying experience during last 24 Hours	02:47 hrs
Rest period before the flight	19 hrs

There was no Flight Duty Time Limitation violation in respect of operating crew. Also, he was not involved in any Accident/ Serious Incident previously.

## **1.6 Helicopter Information :**

### **1.6.1 General Description**

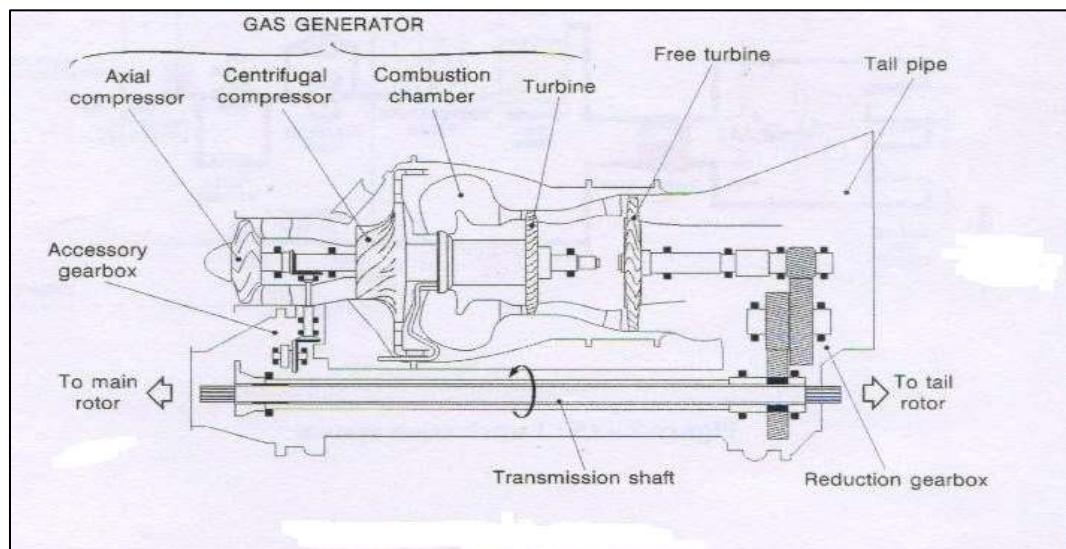
AS350 B3 helicopter VT-PED is a single engine helicopter manufactured by M/s Eurocopter, France. As per flight manual, maximum operating altitude is 23000 ft and Maximum takeoff weight is 2250 Kg. The standard helicopter seating configuration is 01 Pilot and 05 passengers. Helicopter was having three main rotor blades, two tail rotor blades with Vehicle and Engine Multifunction Display (VEMD), dual Channel Full Authority Digital Engine Control (FADEC) and Garmin Global Positioning System (GPS).



**Three- view drawing of AS 350 B3**

AS 350 B 3 Helicopter is powered by a single Turbomeca Arriel 2B1 turbo shaft engine having maximum take-off power of 650 kW (870 SHP). It is located in a separate fireproof compartment after Main Gear Box (MGB) and above the rear cargo compartment. It is connected to the MGB by a shaft mounted between two flexible couplings. The engine is modular free-wheel composed of five modules

1. Axial Compressor Module (single-stage with bleed valve)
2. Gas Generator Module
  - A centrifugal compressor
  - An annular combustion chamber
  - A single-stage gas generator turbine
3. Free Turbine Module
4. Reduction Gear Module (reduces the free turbine speed from 39158 down to 6000 rpm)
5. Output Shaft Module (Transmits power to the MGB and accessory drive couplings)



**View of Turbomeca Arriel 2B1 Engine**

### **1.6.2 Helicopter Information**

- a) Helicopter Type : AS 350 B3
- b) Helicopter Registration: VT-PED
- c) Helicopter S. No. : 7100
- d) Year of Manufacturer: 2010
- e) C of R : 4199 dated 15<sup>th</sup> March 2011
- f) C of A: 6308 valid from 15<sup>th</sup> March 2011 to 10<sup>th</sup> January 2016
- g) ARC Issued on : 09-01-2013
- h) ARC valid up to : 09-01-2014
- i) Engine Type : ARRIEL 2 B1
- j) Engine Sl. No. : 51067
- k) Helicopter Empty Weight: 1267.10 Kg
- l) Helicopter all up weight: 2250 Kg
- m) Date of Helicopter weighment: 11-02-2013
- n) Total Helicopter Hours: 1228: 58 hrs
- o) Total Engine Hours: 1228:58 hrs
- p) Total Landings: 7876
- q) Last major Inspection : 1200 hrs/48 Months on 17<sup>th</sup> May 2013 at Delhi

The Helicopter was registered in “Normal” category & Sub Division-“Passenger Aircraft”.

Helicopter was having Aeromobile License No. A-0074/002/RLO (NR) and valid up to 31-12-2016. Last 100 Hrs/ 12 Months Inspection schedule was carried out at 1218:35 Hrs on 19-06-2013 at Delhi. Daily inspection Schedule was carried out on 21-06-2013 at Sahastradhara, Dehradun and helicopter has carried out 02:47 hrs flying & 07 landings before the accident.

Scrutiny of the defect register reveled that there was no defect reported on the helicopter before the accident flight. Last defect reported was on 14-06-2013

regarding “Transponder BITE not working” and transponder was replaced with serviceable unit.

Load and trim sheet of accident flight was not prepared. However, it was computed after flight and center of gravity found within limit.

**1.7 Meteorological Information:**

There was no metrological office situated at Kedarnath or Phata. However, as per pilot statement the visibility at Rambara was 2-3 Kms with calm winds. Metrological office, Dehradun has issued weather predictions for Kedarnath area on 21-06-2013 at 0330 UTC in Hindi. As per report there was “Partly cloudy sky. Few area, there is possibility of thunder storm cloud development /very light rain. Fog may occur early in the morning.”

**1.8 Aids to Navigation:**

There was no Navigational aid available at Rambara (Jungle Chatti) Helipad. The flying from Phata to Kedarnath was carried out using ground references. Wind Director Indicator (windsock) and ‘H’ marking were available at Phata helipad, Rudraprayag.

**1.9 Communication:**

There was no communication between Phata & elsewhere due floods. Helicopter flying in the area were in contact with each other through the aircraft radio and Icom hand held sets on common valley frequency of 122.7 MHz.

**1.10 Aerodrome Information:**

The helipad at Rambara (Jungle Chatti) is temporary helipad situated at approx 8500 feet made at end of Road curve for rescue/evacuation of stranded pilgrims. The helipad surface contains loose soil and tiles with slope. There was no H marking at

Helipad surface and lots of obstructions were around the helipad. The approach to helipad was around 210°- 220° along the cliff side.

DGCA has issued Civil Aviation Requirement (CAR) Section-4, Series B Part II regarding “Minimum Safety Requirements for Temporary Helicopter Landing Areas” to be followed while constructing Temporary helipads. As per para 5.1 of the CAR “Before an area is used as take-off and landing area, operator shall take necessary measures to protect the site by cordoning ,fencing with fragile materials, etc to ensure that no un authorized persons, vehicles or stray animals enter into the perimeter of safety area.”

Civil Aviation Department, Uttarakhand vide letter No.114/Pr. Secy./ 2013 dated 18<sup>th</sup> June 2013 allowed all Non Schedule Helicopter operators to carry out rescue and evacuation at five (05) helipads including at Rambara.

Helipad at Phata, Rudraprag was situated at 5500 feet and the coordinates of helipad are 30° 35'N and 79° 03'E. The helipad was made of concrete with 'H' painted at center and have Wind Direction indicator.



**1.11 Flight Recorders :**

Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR) were not fitted on helicopter neither required as per existing Civil Aviation Requirements.

**1.12 Wreckage & Impact Information:**

During takeoff at Rambara Helipad, the main rotor blade hit mountain on right side resulting rotation of helicopter in anti-clockwise direction. As helicopter rotated, tail rotor hit mountain resulting breaking of Tail boom along with tail gear box. Helicopter impacted ground heavily and received substantial damages. The wreckage of the helicopter was confined to Rambara Helipad on the sloping surface in upright position.

**1.13 Medical & Pathological Information:**

After the accident, post flight medical check of pilot was carried out by Medical Officer, Guptakashi, District Rudraprayag on 21-06-2013 and was found physically and mentally fit.

**1.14 Fire:** There was no pre or post impact fire.

**1.15 Survival Aspects:** The accident was survivable.

**1.16 Test and Research:**

Following components were sent to BEA, France (French Accident Investigation Agency) for downloading and analysis.

1. Electronic Control Unit (ECU) part no. EMC-101, serial no. 10APM0445 manufactured Goodrich pump & Engine control systems, Turbomeca ,France.
2. Vehicle Engine Monitoring Display (VEMD) part no. B19030MD05 and serial no. 7359 manufactured by Thales, France.

VEMD was downloaded on 19/03/2014. As per report “the last flight recorded is the flight numbered 1633 with duration of 2 hr 36min 45s. Six failures have been recorded. ECU was downloaded on 27/03/2014 and six failures and two over limitations were recorded.

The event flight was identified in the recorded data of both computers. The data recorded were found to be consistent. According to BEA, Airbus Helicopters and Turbomeca, the failure of collective pitch anticipator potentiometer is one of the first failures recorded in the sequence of failures following an impact with the ground. The computers recorded a high number of failures related to various independent chains and occurring within a short period of time. Those failures were most probably the consequence of the impact of the blades. According to the BEA and manufacturers, the recorded parameters associated to that failure were consistent with blade contact with the mountain.

#### **1.17. Organizational & Management Information:**

M/s Prabhatam Aviation Pvt. Ltd. (PAPL) is a Non-Scheduled Operator situated at Delhi. The company is having Non- Scheduled Operating Permit (NSOP) No. 03/2005 and valid till 15-06-2015. Company has 04 helicopters registered in the permit.

The helicopter VT- PED was maintained by M/s Shaurya Aeronautics (P) Ltd., New Delhi which is a CAR 145 approved organisation.

#### **1.18 Additional Information:**

##### **1.18.1 Standard Operating Procedure**

PAPL was using an SOP issue 3 dated 23<sup>rd</sup> April 2012 for Phata- Kedarnathji Helicopter Operations. The SOP contains details of operations requirements including overdue actions. As per SOP “all operations will be carried out in VFR condition”. The minimum

visibility requirements for Day VFR flying is 05 Kms as per ENR 1.2 of AIP India. However, as per pilot statement visibility at time of accident was 02-03 kms with calm winds.

#### **1.18.2 Pilot training**

DGCA has issued CAR Section 7 Series B Part XIV dated 30<sup>th</sup> November 2006 on "Recurrent training requirements for Helicopter Pilots". As per CAR pilots have to undergo Recurrent checks consisting of Ground training, Simulator Training, Emergency and Survival Training, CRM training and Dangerous Goods Training. The Simulator Training for critical emergencies consists of at least 5 hours of mandatory practice of critical emergencies in simulator such as engine failure, system failure, tail rotor failure etc. which cannot be practiced or simulated in actual flying shall be carried out by a pilot on specific type of flight simulator once in two years.

As per records submitted , the involved pilot has not undergone Simulator Training for critical emergencies on AS 350 B3 Helicopter.

#### **1.18.3 Crowd Control at Temporary Helipad**

Due to sudden flash floods at Kedarnath on 15<sup>th</sup> June 2013, the road connection of Kedarnath Shrine and Rambara was cut from the rest of the world. Thousands of pilgrims were stuck at Kedarnath Shrine and Rambara awaiting rescue by Helicopter. The make shift helipad was made with the help of volunteers and by National Disaster Response Force (NDRF) persons. As per statement of volunteer "after third landing of helicopter at Rambara Helipad, there was sudden rush of pilgrims toward helicopter trying to board helicopter at the same time .In this process, main rotor blades hit the mountain cliff and helicopter crashed."

#### **1.19 Useful and Effective Techniques: NIL**

## **2. ANALYSIS:**

### **2.1 Serviceability of Helicopter**

The helicopter was manufactured by M/s Eurocopter, France in year 2010. The helicopter was issued with Indian Certificate of Registration (C of R) no. 4199 on 15-03-2011 under category 'A' in the name of M/s Prabhatam Aviation Pvt Ltd. It holds valid Indian certificate of Airworthiness no. 6308 issued on 15-03-2011 under category Normal, Sub-Division Passenger. The C of A was valid till 10-01-2016. Airworthiness Review Certificate was issued on 09-01-2013 and was valid till 09-01-2014. The helicopter and engine had done 1228:58 airframe hrs. Last major Inspection carried was 100 Hrs/12 Months at 1218:35 Hrs on 19-06-2013. Scrutiny of the defect register revealed that there was no defect reported on the helicopter before the accident flight.

On the day of accident, helicopter VT-PED had carried out a total of 02:47 hours of flying and 07 landings before accident. Examination of the wreckage revealed that it was confined around the place of impact indicating that there was no in-flight disintegration of any part of the Helicopter .

Load and trim sheet of accident flight was not prepared. However, it was computed after flight and center of gravity found within limit.

Data was down loaded from ECU and VEMD of Helicopter. Six failures were recorded and the recorded parameters associated to that failure were consistent with blade contact with the mountain.

In view of the foregoing, it can therefore be inferred that serviceability of the helicopter is not a factor to the accident.

## **2.2 Weather**

As per pilot statement visibility at time of accident was 02-03 kms with calm winds. However, as per SOP of M/s Prabhatam Aviation Pvt. Ltd. all operations at Phata and Kedarnath ji Shrine shall be carried out by Day VFR conditions i.e. visibility of 05 kms.

Though, helicopter flown in low visibility but weather was not a contributory factor for accident.

## **2.3 Temporary Helipad at Rambara**

The helipad at Rambara (Jungle Chatti) was a temporary helipad made at end of Road curve for rescue/evacuation of stranded pilgrims situated at approx 8500 feet. The helipad surface contains loose soil and tiles with slope. There was no H marking at Helipad surface and lots of obstructions were around the helipad. The approach to helipad was around 210°- 220° along the cliff side.

DGCA has issued Civil Aviation Requirement (CAR) Section-4, Series B Part II regarding "Minimum Safety Requirements for Temporary Helicopter Landing Areas" to be followed while constructing Temporary helipads.

Civil Aviation Department, Uttarakhand vide letter No.114/Pr. Secy./ 2013 dated 18<sup>th</sup> June 2013 allowed Non Schedule Helicopter operators to carry out rescue and evacuation at Rambara.

Improper construction and location of temporary helipad was contributory factor to the accident.

## **2.4 Pilot Factor**

The pilot was having valid license and medical. On day of accident he had carried out 02:47 hrs of flying with 07 landings. The pilot was flying in Kedarnathji –Phata since September 2012. He had total of 2312:15 hrs of flying with 328:25 hrs experiences on

type. Pilot has not carried out 5 hours of mandatory practice of critical emergencies in simulator as required in CAR Section 7 Series B Part XIV dated 30<sup>th</sup> November 2006.

## **2.5 Circumstances Leading to Accident.**

On 21<sup>st</sup> June 2013, M/s Prabhatam Aviation Pvt Ltd., AS 350 B3 helicopter VT-PED was engaged in rescue of pilgrims from Kedarnath Ji Shrine and Rambara to Phata. Helicopter took off from Sehestra Dhara Helipad, Dehradun and carried out three (03) sortie from Kedarnath Ji Shrine to Phata, two (02) sortie from Rambara to Phata under the command of single pilot having CPL (H). While carrying out third (03) sortie, as helicopter landed there was sudden rush of unruly pilgrims toward helicopter trying to board helicopter at the same time. Pilot tried to take off without passengers to avoid unruly pilgrims and in this process, main rotor blade hit the mountain cliff resulting in damage to main rotors and tail boom. Helicopter was substantially damaged. There was no fire or injury.

The accident occurred at around 0915 UTC. Visibility at the time of accident was 02-03 Kms. There was no fire or injury. The pilot was later rescued by Indian Air Force helicopter.

Data was down loaded from ECU and VEMD of Helicopter. Six failures were recorded and the recorded parameters associated to that failure were consistent with blade contact with the mountain.

## **3. CONCLUSION :**

### **3.1 Findings :**

1. On 21<sup>st</sup> June 2013, M/s Prabhatam Aviation Pvt. Ltd. AS 350 B 3 Helicopter VT-PED was engaged in rescue flights at Kedarnath and Rambara.
2. The Helicopter had valid C of A & was maintained in serviceable condition.

3. The pilot had valid license and his medical was current.
4. The Daily Inspection schedule of the Helicopter was carried out by the AME before the flight.
5. Helicopter VT- PED has carried out total 02:47 hrs flying and 07 landings on the day before the accident.
6. The involved pilot had total of 2312:15 hrs of flying with 328:25 hrs experiences on type.
7. Pilot took off from Sehestradhara, Dehradun and successfully carried out 03 rescue sorties from Phata- Kedarnath and 02 sorties from Phata- Rambara.
8. While carrying out third (03) sortie, as helicopter landed there was sudden rush of pilgrims toward helicopter trying to board helicopter at the same time. Pilot tried to take off without passengers to avoid unruly pilgrims and in this process, main rotor blade hit the mountain cliff resulting in damage to main rotors and tail boom.
9. There was no fire and injury to occupant.
10. The crowd control at Rambara was carried out by National Disaster Response Force (NDRF) and few volunteers.
11. Visibility at the time of accident was 02-03 kms whereas as SOP of PAPL Helicopter operations at Kedarnath shall be carried out in day VFR.
12. The temporary helipad at Rambara was situated at 8500 feet made at the end of Road with slope, loose surface tiles and there were lot of obstruction around it.
13. Pilot had not carried out simulator training for critical emergencies as required in CAR.

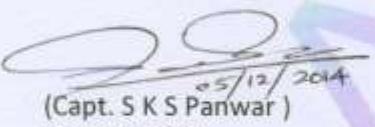
### **3.2 Probable Cause of Accident :**

During takeoff from temporary helipad by pilot to avoid sudden rush of unruly pilgrims, helicopter main rotor blades hit the mountain cliff resulting substantial damage to helicopter.

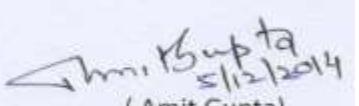
Improper construction and location of temporary helipad along with improper crowd control was contributory factor to the accident.

### **4. Safety Recommendations :**

1. Due to number of Helicopter crashes during rescue and relief work at Uttarakhand in year 2013, DGCA may issue safety guidelines on rescue and relief operations. There should be no violations of laid down regulations on the pretext of natural calamity.



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Place: New Delhi