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FINAL INVESTIGATION REPORT ON
ACCIDENT TO M/s PRABHATAM
AVIATION PVT. LTD. ALOUETTE III
CHETAK HELICOPTER VT-EGK AT SHRI
KEDARNATHJI ON 22nd MAY, 2007

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**REPORT ON ACCIDENT TO M/S PRABHATAM AVIATION PVT.
LTD. ALOUETTE III CHETAK HELICOPTER VT-EGK AT SHRI
KEDARNATHJI ON 22TH MAY, 2007**

General Information:

- a. Aircraft : Type Chetak Helicopter
Model SA 316 B Alouette III
Nationality Indian
Registration VT-EGK
- b. Owner : Prabhatam Aviation Pvt. Ltd., Delhi
- c. Operator or Hirer : -do-
- d. Pilot in Command : CHPL No. 620
Extent of Injuries : Nil
- e. Ground crew : Traffic Hand
Extent of Injuries : Fatal
- e. No. of Passengers : Six
Extent of Injuries : Nil
- f. Location of Accident : Shri Kedarnathji Helipad,
Latitude : 30 ° 45' N
Longitude : 79 ° 04' E
Elevation : 11500 feet AMSL
- g. Date & Time of Accident : 22.05.07, 0400 UTC Approx.

(All timings in the report are in UTC)

Summary:

On 22.5.2007, SA 316B Alouette III Chetak Helicopter VT-EGK belonging to M/s Prabhatam Aviation Pvt. Ltd., Delhi was engaged in non-scheduled operation from Phata to Shri Kedarnathaji and took off from Phata helipad at around 0350 UTC with seven persons on board including the pilot. After making normal approach for landing the helicopter landed on right hand side of Shri Kedarnathji Eastern helipad on unpaved area. One of the ground staff approached towards the front right side of the helicopter without waiting

for the signal from the pilot for assisting the passengers in disembarking. In the process he was hit by one of the main rotor blades which were rotating at full RPM and succumbed to his injuries. The accident took place in daylight conditions. The Weather was bright & sunny with about 1 to 2 knots of tailwind.

1. FACTUAL INFORMATION:

1.1 *History of the flight:*

On 22.5.2007 SA 316B Alouette Chetak Helicopter VT-EGK belonging to M/s Prabhatam Aviation Pvt. Ltd., Delhi was engaged in non-scheduled operation flight from Phata to Shri Kedarnathaji under the command of pilot holding CHPL No. 620. There were six passengers on board.

Earlier on same day helicopter had operated five sectors (Phata – Shri Kedarnathaji – Phata) with the same flight crew. All these sectors were uneventful and pilot has not reported any abnormality about the helicopter controls.

After refueling 180 liters of Jet A-1/Aviation Turbine Fuel at Phata, helicopter took off from Phata helipad at around 0350 UTC. The take off and the flight till touchdown was normal. As per pilot statement the weather was bright & sunny with about 1 to 2 knots of tailwind. The helicopter made normal approach on right side of touchdown and lift-off area (TLOF) on un paved surface which is a Kutcha hard grassy surface, of Shri Kedarnathaji Eastern helipad with nose facing in North direction. The helipad has however got paved surface marked 'H'.

As per pilot statement when helicopter came to hover over the helipad where the landings were made usually, the marshaller signalled the pilot to commence a sit-down. After landing, when the main blades were rotating at full RPM with passengers on board, one of the ground staff approached towards the front right side of the helicopter and during this process the main rotor blade hit him and he succumbed to his injuries. Ground staff had not lowered his body or head, as were the instructions given while approaching the helicopter. The weather was fine at the time of accident. Tip of the main rotor red blade was found damaged. After the accident local people became violent and injured the

pilot and other staff and caused more damages to the helicopter. The final position of the helicopter's Nose landing gear tyre was found in the 3 inch deep soil pit.

Pilot has mentioned in his statement that as per the procedure, after touchdown, the collective is fully lowered and then the controls are neutralized. This is a very gradual process done very smoothly. Before the controls are neutralized the main rotor disc could be tilted in any direction depending upon number of factors. It could have been on any side. It may have even been in the forward position also.

Once the controls are neutralised then pilot could have been comfortable he would have signalled the ground crew to approach. Unfortunately ground crew approached without waiting for signal from him to approach the helicopter.

Accident took place during day time at 0400 UTC & weather at that time was fine. There was no injury to any person on board the helicopter. However, the ground crew received fatal injury due hit with main rotor blade. Helicopter received minor damage to the main rotor (Red) blade tip.

The flight plan was submitted/ booked on phone every day. The FIC & ADC Nos. of the day of accident were 0011 & Y48 respectively.

1.2 ***Injuries to persons:***

Injuries	Crew	Passengers	Others
Fatal	-	-	1*
Serious	-	-	-
Minor/ None	1	6	-

* Ground crew

1.3 ***Damage to aircraft:***

- Following damages were observed
- Tip of the Main Rotor blade found substantially damaged and the attachment screws of the tip to the blade were intact.

- The upper side of the skin behind spar and near blade tip rib found bulged and cracked in the area around nine square inches.

1.4 Other Damage:

Nil

1.5 Personnnel information:

After the accident, as per the operator, local people became violent and injured the pilot & other staff. Helicopter was also further damaged. Operator has also informed that their office at Phata and Shri Kedarnath Ji were ransacked by infuriated mob, resulting in loss of documents like Pilot Personal Log Book, Reservation register, Boarding Pass, Visitors Book etc. Operator has lodged a complaint to Police Station Ukhimath Distt. Rudraprayag (Utrakhand).

Operator has therefore not submitted the pilot personnel logbook for investigation. Operator was asked to provide the information including the training data in the absence of the records. Following information is as supplied by the operator.

The helicopter was operated by single pilot at the time of accident. Concerned pilot served the IAF for 11 years. He joined Prabhatam Aviation Pvt. Ltd. in Feb. 2004 and has about 3 years of flying experience in civil aviation. The flying hours given below are an approximation, which is supplied by operator as operator has informed that the personal flying logbook of pilot has been lost in the post accident violence at the site by the local people. Relevant details of the pilot are as below:-

1.5.1. Pilot- in- Command

The pilot holding	:	CHPL
Date of Birth	:	29 th March, 1971
Age	:	36 years 1 month
Details of license		
Commercial Pilot's License No.:		620
(Helicopter)		
Issued on	:	16 th January, 2004
Valid upto	:	15.01.2009
FRTO licence No.	:	8876

Issued on	:	15 th October, 2003
Valid upto	:	14.10.2008
RTR License No.	:	304/2003
Issued on	:	17 th September, 2003
Last Med. Exam.	:	13.07.2006
Helicopter endorsed	:	Chetak
Total Flying experience	:	2250 hrs.
Total flying experience as PIC	:	1450 hrs.
Total flying experience on Chetak/Cheetah helicopter	:	2000 hrs.
Total hill flying experience as PIC	:	2000 hrs.
Total hill flying experience On Chetak/Cheetah helicopter	:	700 hrs.
During last 90 days	:	116:35 hrs.
During last 30 days	:	81:50 hrs.
During last 7 days	:	24:20 hrs.
During last 24 hours	:	01:40hrs.

There was no skill test carried out or any assessment of high altitude landings and take offs was made for the involved pilot. Proficiency checks records were lost in post accident violence.

1.5.2 Ground Crew:

As per pilot statement, the involved ground staff had been working for the past two years with Prabhatam Aviation Pvt. Ltd. The ground crew age was about 22 years & height was 5 feet 6 inches approx.

As per SOP the ground crew should take following precautions at Shri Kedarnathji helipad:

- Upon landing after receiving the pilot's signal the ground crew will come and disembark the passengers with rotors turning.

As the embarking and disembarking of the passengers is taking place with the rotors turning the ground crew is to take special precautions while escorting the passengers to & fro from the helicopter.

1.6 *Aircraft information:*

- 1.6.1 Alouette III SA 316 B helicopter bearing Sl. No. AH-240 has a three-bladed lifting rotor and an anti-torque tail rotor. It is powered by a Turbomeca "Artouste III B" turbine engine and is capable of carrying six passengers plus one pilot. It was manufactured by M/s Hindustan Aeronautics Ltd., Helicopter Division, Bangalore in the year 1979. The helicopter is fitted with a tricycle landing gear consisting of a main gear unit and a nose gear unit provided with a centering cam, which acts for angles up to $\pm 45^\circ$ relative to the centre line of the helicopter. The maximum height of helicopter to top of main rotor lifting eye, at empty weight is 3.090 m (10 feet 1.6 inch).

The helicopter is registered in India and was issued with Certificate of Registration No. 2185/3 in Cat. 'A' on 29.11.2006 with owner and operator as M/s Prabhatam Aviation Pvt. Ltd. Certificate of Airworthiness No. 1717 was issued in NORMAL Category having subdivision 'PASSENGER'. The last revalidation of C of A was done on 16.03.07 & the certificate was valid till 15.03.2008. Aero-mobile license no. A-429 was valid till 31.12.2007.

M/s Shaurya Aeronautics Pvt. Ltd., Delhi is presently maintaining the helicopter. The certificate of release to service in respect of the helicopter and engine was last issued on 21.05.07, after carrying out 25hrs/15days inspection maintenance schedule on the helicopter.

As per last approved weight schedule, empty weight of the helicopter is 1290 Kgs. and its authorized Max. all up weight is 2200 Kgs.

- 1.6.2 Operator carried out 100hrs/180 day's inspection on 24.04.2007. Prior to the accident flight helicopter flew with same pilot on five sectors (Phata

- Shri Kedarnathaji - Phata) on the day of accident (Total flying hours 01:40 hrs.) and the pilot reported no snag.

- 1.6.3 Flying details of the aircraft and its engine are documented in different log books and the brief is as below:

AIRFRAME HOURS:

I	Total Hours since new	5165:45
II	Hours since last C of A renewal	115:05
III	Hours since last 100hrs/180 days Inspection.	81:40
IV	Hours since last 25 hrs./15 days)	06:40

1.6.4 **ENGINE HOURS:**

I	Engine type	ARTOUSTE IIIB
II	Engine Serial No.	H55117
III	Hours since new	3391:50
IV	Hours since last Complete overhaul	530:20

- 1.6.5 There was no snag reported after the last inspection performed on the helicopter.

- 1.6.6 The helicopter was refueled 180 liters of Jet A-1/Aviation Turbine fuel at Phata.

- 1.6.7 At the time of take off from Phata helipad the helicopter had all up wt. of 1965:400 kgs. against authorized maximum take off wt. of 2200 kgs. as per weight schedule and during landing at Shri Kedarnathji the helicopter all up weight was 1942 Kgs. The mass and centre of gravity was within the prescribed limits during takeoff and landing.

1.7 **Meteorological information:**

As per operator SOP all flying has to be done in day VFR conditions only. Due to the absence of Met station in the area, the specific local conditions and short duration of the flight the following procedure was being adopted:

- PIC will check the weather before start of a flight.

- From Phata helipad look in the direction of Sh. Kedarnathji Shrine, ascertain prevailing weather conditions like visibility, clouds etc.
- If weather conditions are within minima for VFR flying then flying will be under taken.
- If required weather at Kedarnathji Shrine shall be ascertained by telephone.
- If the weather at any stage is found to be unsuitable for continuing flight the pilot will promptly return to Phata after giving a RT call.
- General weather can be obtained from either Delhi Met/Deharadun ATCs.

As per the pilot statement the weather was bright & sunny with about 1 to 2 knots of tailwind at the time of accident.

1.8 *Aids to navigation:*

The flight was conducted under VFR rules. PPHL also operates in the same area, and therefore an SOP was made for flying in the valley to be followed by both the operators. As per company SOP, PAPL helicopter will give call prior to take off and landing. PAPL helicopter will fly to the right side of valley and give all the mandatory RT calls. The route to be followed will be Phata-Rampur-Gaurikund-Garud Chatti-Kedarnath. Descend on the way back will again be similar by maintaining right side of the valley and following the reciprocal of the above mentioned route. In addition PAPL helicopter will give position report RT call at following places: Rampur, Gaurikund & Garud Chatti.

1.9 *Communications:*

The helicopter was fitted with VHF COMM Transceiver equipments for two-way RT communication. As per company SOP frequency 122.7 MHz used in the hills. All mandatory RT calls like take off, landing, finals will be given. R/T call will also specify the destination that the helicopter is proceeding to.

1.10 *Helipad information:*

Kedarnath ji right Eastern Helipad is a State Government helipad. It is owned by Government of Uttaranchal. Elevation of helipad is 11500 feet, Co-ordinates are Latitude 30°45'N, Longitude 79°04'E and its

dimensions are 30MX30M. Recently on 02/05/2007 helipad joint inspection was carried by the DGCA. The surface of the site is hard grassy & plain and approx area of 16ft X 16ft the aiming point of the helipads is made with cement & stones apparently which can withstand the load & downwash of the proposed helicopter. Inspection team have made some deficiencies out of them one deficiency was that "H" marked area is not very smooth and some work will be required to smoothen the surface by District Administration. The action taken report forwarded to DGCA has not mentioned the action on said deficiency and same deficiency was still persisting at the time of accident.

As per pilot statement which was corroborated by ground staff he used to land the helicopter at the same place i.e. on unpaved surface (Kutchha i.e. hard grassy surface) as it landed on 22.05.2007.

1.11 Flight Recorders:

Helicopter was neither required nor fitted with any of the recorders.

1.12 Wreckage and impact information:

The accident occurred when the helicopter had touched down for landing and the rotors were rotating.

1.13 Medical & pathological information:

The ground staff was hit by the main rotor-rotating blade and he succumbed to injuries. No injury received to any of the occupants including pilot onboard the helicopter during the accident

1.14 Fire:

There was no fire at any stage of the accident.

1.15 Survival Aspects:

One of the ground staff had received fatal head injury by rotating main rotor blade, after the helicopter has touched down. The accident was non survivable.

1.16 Tests & Research:

The sample of fuel was drawn from the helicopter and sent to R&D Lab of DGCA and sample was found meeting the requirements.

1.17 **Organizational & Management Information:**

- The company operations manual issue No.1 dated 30/04/2005 was not as per the latest Format and requirements. The company operations manual states that helicopter to be used for carrying passengers and offshore operations. However, hill operations are not mentioned in the company operations manual.
- CAR Section 7 Series B Part XIV requires that - The operator shall be responsible for training of the pilots of his company. Records of all training, checks and test carried out by each pilot shall be maintained, updated and retained for a period of at least 3 years.
- The Operator could not depute the involved Marshaller for investigation and informed that he has left the company/not reported for duty after the accident.
- DGCA has approved the Standard Operating Procedures (SOP) for Phata-Kedarnath-Phata on 19/05/2006. The subject SOP has mentioned following regarding Kedarnathji Helipad: -

“PCPL i.e. new name PAPL will be using the upper left (Western) helipad. When any other helicopter is using or likely to use the upper left (Western) helipad then PAPL helicopter will use the lower right (Eastern) helipad.”

However, copy of the SOP provided by operator indicates that PAPL will be using the Southern helipad and when any other helicopter is using or likely to use the Southern helipad then PAPL helicopter will use the Northern helipad.

- The approved SOP also states that “If for some reason like non-availability of passengers etc. the helicopter is required to be switched off then the total duration of halt will not exceed 15 minutes (keeping in view the limitation imposed by the SC of oxygen for crew)”. This para was not mentioned in the SOP that was provided by the operator.

- Recently on 02/05/2007 helipad joint inspection was carried by the DGCA. They have made some deficiencies out of them one deficiency was that "H" marked area is not very smooth and some work will be required to smoothen the surface by District Administration. The action taken report forwarded to DGCA does not mention the action on said deficiency.

1.18 Additional Information:

Nil

1.19 Useful or effective investigation techniques:

Nil.

After landing & touchdown, helicopter main rotor blades were rotating at full RPM with passengers on board.

In view of the above, the maintenance and serviceability of the helicopter is not considered as a contributory factor to the accident.

WEATHER:

The weather condition at Shri Kedarnathji helipad was bright & sunny with about 1 to 2 knots of tailwind at the time of accident. The time of accident was 0400 UTC i.e. in-day time.

The weather has not contributed to the accident.

Pilot Factor:

SA 316B Alouette III Chetak Helicopter is certified for single crew operation as per Certificate of Airworthiness /Flight manual. The pilot was having valid license for undertaking the flight & was declared medically fit. The approved SOP for the operation does not require oxygen provided the helicopter is not being switched off at Shri Kedarnathji under normal circumstances.

2. ANALYSIS

2.1 **HELICOPTER:**

The helicopter had valid Certificate of Airworthiness and was maintained as per the approved Maintenance Schedules. The certificate of release to service in respect of the aircraft and engine was valid. There was sufficient fuel to complete the flight. The All Up Weight and Centre of Gravity of the aircraft were within the specified and approved limits at the time of commencement of flight. The helicopter had earlier flown for five sectors (Phata – Shri Kedarnathaji – Phata) on the same day (Total flying hours 01:40hrs) without any abnormality or snag. The involved flight crew had operated all the five sectors and there was no snag reported before and after the accident. This indicates that the helicopter was serviceable at the time of accident.

After landing & touchdown, helicopter main rotor blades were rotating at full RPM with passengers on board.

In view of the above, the maintenance and serviceability of the helicopter is not considered as a contributory factor to the accident.

2.2 WEATHER:

The weather condition at Shri Kedarnathji helipad was bright & sunny with about 1 to 2 knots of tailwind at the time of accident. The time of accident was 0400 UTC i.e in day time.

The weather has not contributed to the accident.

2.3 Pilot Factor :

SA 316B Alouette III Chetak Helicopter is certified for single crew operation as per Certificate of Airworthiness /Flight manual. The pilot was having valid licence for undertaking the flight & was declared medically fit. The approved SOP for the operation does not require oxygen provided the helicopter is not being switched off at Shri Kedarnath ji under normal circumstances.

He served the IAF for 11 years. Thereafter, he joined Prabhatam Aviation Pvt. Ltd. in Feb. 2004 and has about 3 years of flying experience in civil aviation. There was neither skill test carried out nor any assessment of high altitude landings and take offs was made for the involved pilot. Proficiency checks records were lost in post accident violence. (The personal flying log book of pilot has been lost in the post accident violence at the site by the local people).

He has approx. 2250 hrs. flying experience on Chetak which includes 1450 hrs. as PIC. He has got total hill flying experience of 2000 hrs. as PIC. In the last 30 days he has flown on Phata-Shri Kedarnathji-Phata as PIC for about 82 hrs. The involved accident was caused due to breakdown of human factors and not due to deficiency in the professional or flying competency of the pilot.

2.4 Standard Operating Procedures:

It is a common practice for helicopter pilot's to embark and disembark passengers with the rotor running after the pilot or ground crew has given an appropriate briefing. The practice is widespread in the industry and is accepted by both companies and passengers even though it involves some risk.

2.5 ORGANISATION & MANAGEMENT:

Based on the factual information as brought out in para 1.17 Organizational & Management Information, some deficiencies, though not contributory to the accident were observed. The operator need to amend and resubmit Operations Manual and resubmit the Operations Manual and SOP.

2.6 CIRCUMSTANCES LEADING TO THE ACCIDENT:

During accident sortie helicopter made normal approach for landing. When helicopter came to hover over the helipad where the landings were made usually, the marshaller signaled the pilot to commence a sit down. When the helicopter after touchdown was in the process of stabilising, pilot noticed that suddenly without waiting for signal from him to approach the helicopter, a ground staff rushed towards the helicopter. Ground staff had not lowered his body or head, as were the instructions given while approaching the helicopter. Though the

statement of marshaller could not be obtained as he had left the company/not reported for duty after the accident, the other eyewitnesses corroborated the sequence of events.

Helicopter made landing on right side of touch down and lift-off area (TLOF) on unpaved surface (completely on Kutcha hard grassy surface) of Shri Kedarnathji Eastern helipad with nose facing in North direction at 11,500 feet above mean sea level instead of paved surface made for landing/touchdown, which is marked for 'H'. The pilot used to land at the same place earlier also.

As per the procedure explained for landing, after touchdown, the collective is fully lowered and controls are neutralized. This is a very gradual process to be carried out very smoothly. Before the controls are neutralized the disc acts as a plate and depending upon the direction / speed of winds, attitude of the helicopter, etc. could be tilted in any direction including the forward direction. In addition the reduction in distance between the ground and the main rotor blade tip due droop also depends upon the condition of nose wheel position and the cyclic pitch control position. Once the controls are neutralised, the main rotor disc also becomes horizontal and the pilot gives signal to the ground crew to approach. Though in normal circumstances the height of main rotor blades (disc) is quite high and is far above the height of the involved ground staff. Unfortunately ground crew approached without waiting for pilot signal to approach.

The rotor disk after touchdown may have been tilted in the forward direction, causing fatal injury to the ground crew. The surface of the landing area and non following of the safety instructions by the Ground staff contributed to the accident. From the above it is evident that the accident had happened due to combination of above events.

3. CONCLUSIONS:

3.1 Findings:

- 3.1.1 The helicopter had valid Certificate of Airworthiness and it was being maintained airworthy as per the approved maintenance schedules.
- 3.1.2 The certificate of release to service in respect of the helicopter and engine issued by appropriately licensed helicopter maintenance engineer was valid on the day of accident.

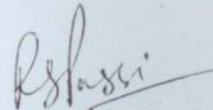
- 3.1.3 The All-up-weight and Centre of Gravity of the helicopter were within the specified and approved limits.
- 3.1.4 The helicopter was fully serviceable and had flown five sectors earlier without any abnormality/snag.
- 3.1.5 The crew operating the flight was appropriately licensed to undertake the flight.
- 3.1.6 The organisation has not provided training/checks records like clearance for hill operation as PIC by an examiner, special training specific to hill operation, periodical recurrent checks, proficiency checks & special VFR training for investigation.
- 3.1.7 There was neither skill test carried out nor any assessment of high altitude landings and take offs made for the involved pilot.
- 3.1.8 Operator has not deputed Marshaller for investigation, and informed that he has left the company/not reported for duty after the accident.
- 3.1.9 The flight plan was submitted/ booked on phone everyday by the crew, instead of filing the flight plan and submitting on fax to ATC.
- 3.1.10 After landing, when the main blades were rotating at full RPM with passengers on board, one of the ground staff approached towards the front right side of the helicopter and during this process the main rotor blade hit him and he succumbed to his injuries.
- 3.1.11 Helicopter main rotor (red) blade tip was damaged, due to hitting the ground crew.
- 3.1.12 After the accident local people became violent and injured the pilot and other staff and caused more damages to the helicopter.
- 3.1.13 The final position of the helicopter's Nose landing gear tyre was found in the 3 inch deep soil pit.
- 3.1.14 As the pilot log book has been lost in the post accident violence at the site by the local people, the pilot flying hours are an approximation.
- 3.1.15 Company operations manual has not been updated as per DGCA requirements.
- 3.1.16 The SOP submitted by the operator used different nomenclature for identifying the helipads.
- 3.1.17 Complete action taken report on the deficiencies of the helipad joint inspection by the DGCA was not submitted.

3.2 ***Probable Cause:***

After landing, when the main blades were rotating at full RPM with passengers on board, one of the ground staff approached towards the front right side of the helicopter and during this process the main rotor blade hit him and he succumbed to his injuries.

4 **SAFETY RECOMMENDATIONS:**

- (i) Appropriate training specific to hill operations may be imparted to pilot.
- (ii) Refresher training may be given to all ground crew.
- (iii) In view of the deficiencies regarding operational control exercised by the company, a detailed one time safety oversight inspection of operator may be carried out.
- (iv) Non scheduled operators be advised to maintain operational/training records of crew members as required in the regulations.



(R.S. Passi)

Inspector of Accidents
22.1.2010