



**AIRCRAFT ACCIDENT INVESTIGATION BUREAU**

**FINAL INVESTIGATION REPORT ON ACCIDENT  
TO M/s TRANSBHARAT AVIATION PVT. LTD.  
BELL 407 HELICOPTER VT-TBE  
AT SHRI KEDARNATH JI  
ON 24/07/2013**

**AIRCRAFT ACCIDENT INVESTIGATION BUREAU  
MINISTRY OF CIVIL AVIATION  
NEW DELHI INDIA**

AAIB (India) Report No. : 2013-ACC-0

File No. AV.15013/ /2013-AAIB

Published on:

**In accordance with Annex 13 to the International Civil Aviation Organisation Convention and the Aircraft (Investigation of Accidents & incidents) Rules 2012, the sole purpose of this investigation is to prevent aviation accidents. It is not the purpose of the investigation and the associated investigation report to apportion blame or liability.**

**Safety recommendation shall in no case create a presumption of blame or liability for an occurrence**

**FINAL REPORT ON ACCIDENT TO M/S. TRANSBHARAT BELL 407**

**HELICOPTER VT-TBE ON 24.07.2013**

**AT GARUD CHETTI, NEAR KEDARNATH HELIPAD**

1. Aircraft Type : Bell 407 helicopter
- Nationality : Indian
- Registration : VT-TBE
2. Owner/ Operator : Trans Bharat Aviation
3. Pilot – in –Command: CHPL holder
4. Extent of injuries : Fatal
5. Passengers on Board : 01 (Technician)
6. Extent of injuries : Fatal
7. Place of accident : Garud Chetti (Kedarnath)
8. Date of accident : 24.07.2013
9. Time of accident : 1005 UTC
10. Last point of Departure : Kedarnath Shrine Helipad
11. Point of intended landing : Guptkashi
12. Type of operation : Relief / Rehabilitation
13. Phase of operation : Landing (returning due weather)
14. Type of Accident: Cable Hit in poor visibility/weather
15. Damage to helicopter : Destroyed

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## **SYNOPSIS:**

Government of India vide notification no. AV.15013/1/2013-DG ordered investigation of the accident to Bell 407 helicopter VT-TBE belonging to M/s Trans Bharat Aviation Pvt. Ltd. on 24/07/2013 by a Committee of Inquiry. The intimation of the accident was provided to ICAO and other State investigating authorities as per the requirements of ICAO Annexure 13.

During disaster relief operation in Uttarakhand, helicopters were deployed by the State initially for rescue and then for the relief operation. During relief operation, the helicopter VT-TBE took off from Shri Kedarnath ji for Gupt kashi on 24<sup>th</sup> July, 2013. As the helicopter crossed Garud Chetti, it was observed that the weather ahead was packed and beyond Rambada, the valley was totally closed. While returning back drifting clouds were observed and the helicopter went to the left of valley where it hit the dead cable running on the hill. Both the occupants of the helicopter had received fatal injuries. There was no fire.

The accident occurred in poor visibility conditions. All the timings in the report are in IST (UTC + 5.30 hrs.) unless otherwise mentioned.

## **1.1 FACTUAL INFORMATION**

### **1.2 History of the flight**

During the disaster relief operation in Uttarakhand, the helicopter VT-TBE took off on 23<sup>rd</sup> July, 2013 from sehastradhara Helipad, Dehradun for Guptkashi. Helicopter was carrying out shuttle between Gupt kashi and Kedarnath for relief operations. The helicopter was tasked to induct Police Team at Kedarnath along with another helicopter. During the last shuttle, helicopter took off from Kedarnath for Guptkashi, but had to return back to Kedarnath due bad weather. The second helicopter had also returned back to Kedarnath due bad weather alongwith VT-TBE. Since the weather at Kedarnath did not improve, both the helicopter made a night halt at Kedarnath. The crew of the both the helicopters stayed in the camp established by the Police personnel.

The weather next day morning, i.e. 24<sup>th</sup> July, 2013 was bad and the crew of both the helicopters waited for the weather to improve. Since there was no communication facility with other places available at Kedarnath on 24<sup>th</sup> July, 2013, on the slight improvement of weather at around 1000 hours UTC, both the helicopters made an attempt to exit from Kedarnath. It was decided amongst the crew members of both the helicopters that in the event of bad weather, the helicopters will land back at Kedar nath ji Camp helipad. Both the helicopters took off but as they crossed Garud Chetti, it was observed that the weather ahead was packed and beyond Rambada, the valley was totally closed with clouds.

The other helicopter announced on R/T that he was turning back due to bad weather which was acknowledged by the following helicopter VT-TBE. On turning back, the crew of other helicopter saw that weather behind had also almost packed (covered with clouds) and the two helicopters had lost visual contact with each other. As per the crew of this helicopter, he encountered some drifting clouds but could land back at camp helipad. He tried to contact the crew of VT-TBE but there was no response. Later, it was found that the helicopter had crashed by the side of the river across drifting clouds. The helicopter VT-TBE went to the left of valley and hit the dead cable running on

the hill. Both the occupants of the helicopter had received fatal injuries. There was no fire.



**FINAL POSITION OF THE HELICOPTER  
(SELF CONTAINED WRECKAGE)**



**CABLE (WHICH WAS HIT BY HELICOPTER)  
RUNNING ACROSS THE ABANDONED POLE**



**CABLES ALONGWITH VERY SMALL BITS OF HELICOPTER TERTIARY STRUCTURE & MANUAL**



**CLOSE UP OF THE WRECKAGE**



### 1.3 Injuries to persons

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	1	1	NIL
SERIOUS	NIL	NIL	NIL
NONE	NIL	NIL	

### 1.4 Damage to helicopter:

The following points were observed at the site during inspection visit in Kedarnath:

- The major salvage of the helicopter was found lying in the valley below the track path to Kedarnath.
- The abandoned dead cable in the area, above the track path in the valley, on the sloping hill, was found damaged/broken and was lying on the ground between the two poles along with pieces of cabin shell door and torn flight manual.
- Part of one main rotor blade was found on the track.
- Cross-tube assembly with flight steps was found separated with the main fuselage and impacting ground (tow portion dipping ground)
- Seats including that of pilot and co-pilot were found lying nearby to the impact landing place and squeezed up.
- Near to the cross tube assembly, vertical fin (with tail guard) and aft tail portion (tail gear box along with tail rotor blade assembly was found attached along with rear two driveshaft segments) found secured.
- Tail boom section was found in two sections i.e one section attached with vertical fin and gearbox and the other major section attached with the fuselage. Detachment of the horizontal stabilizer observed.
- Tailboom section found attached to fuselage and comprised of oil tank, oil cooler, oil cooler shaft and two segmented driveshaft along with couplings.
- Cabin was observed shifted to left of the main frame of fuselage with both pilot and co pilot seat not present.

- The cockpit was found damaged and the glass frames were broken. The doors at all ends were not attached to their points and were found lying at different places.
- Instrument console was observed detached to the center console with both cyclic and collective control stick not at proper position due impact at landing.
- Passenger cabin was crushed due impact.
- The Three servo actuators along with cyclic and collective input controls at the rooftop were found attached with split pin in place.
- The transmission case was found secured with the pylon beam and corner mounts to the base of the roof.
- All four main rotor blades were found attached and split pin in place to the grip but the portions after half the root section were observed torn, peeled off and deformed.
- Hydraulic tank was found attached. ECU was mounted to the base securely.
- Due to impact, Particle separator was found in bad shape and inclining to forward end of the fuselage.
- On the left side of the main frame the cabin shell at the baggage end was found crushed and peeled off.
- The engine panels were found jammed from both ends as it curved into the engine side. However from outer look through panels, no major damage was observed.

### **1.5 Other damage:**

NIL

### **1.6 Personnel information:**

#### **1.5.1 Pilot – in – Command:**

AGE	:	49 years
Licence	:	CHPL
Date of Issue	:	14 <sup>th</sup> Jan 2010

Valid up to	:	13 Jan 2015
Category	:	Single Engine
Class	:	Land
Endorsements as PIC	:	Bell 407, Alouette-III
Date of Med. Exam.	:	20.02.2013
Med. Exam valid upto	:	19.08.2013
FRTTO Licence No.	:	14006
Validity	:	Valid
Experience on type	:	2332:45 hrs.
Experience as PIC on type	:	1207:40 hrs.
Last flown on type	:	23.07.2013
Total flying experience during last 180 days	:	172:25 hrs.
Total flying experience during last 90 days	:	137:15 hrs.
Total flying experience during last 30 days	:	24:30 hrs.
Total flying experience during last 07 Days	:	10:25 hrs.
Total flying experience during last 24 Hours	:	03:30 hrs.

#### **1.6 Helicopter information:**

Bell 407 helicopter is a single engine helicopter fitted with RR 250C-47B Turboshaft Engine and is manufactured by Rolls Royce. The helicopter is certified in Normal (Passenger) category, for VFR Operations. The maximum operating altitude is 20,000 feet and maximum takeoff weight is 2381 Kgs. The helicopter overall length from tip of the forward blade is 41.40 ft. The helicopter is approved in the "Normal" category.

The fuselage consists of three main sections: The forward section, The intermediate section, The tailboom section. The forward section utilizes aluminum honeycomb and carbon graphite structure and provides the major load carrying elements of the forward cabin. The intermediate section is a semi-monocoque structure which uses bulkheads, longerons and carbon fiber composite side skins. The tailboom is an aluminum monocoque construction which transmits all stresses through its external skins.

**a) Flight Control**

The main rotor is a four-bladed, soft-in-plane design with a composite hub and individually interchangeable blades. The tail rotor is a two-bladed teetering rotor that provides directional control. The helicopter landing gear is a high skid type.

**b) Engine**

The Rolls-Royce 250-C47B engine is a turboshaft engine featuring a free power turbine. The gas generator is composed of a single-stage, single entry centrifugal flow compressor directly coupled to a two-stage gas generator turbine. The integral reduction gearbox has multiple accessory pads and a splined output shaft which mates with the freewheel unit. The engine has a single combustion chamber with single fuel injection and ignite. The engine incorporates a Full Authority Digital Engine Control (FADEC) system. The engine data plate identifies the engine rated horsepower as 650 shp.

The helicopter was manufactured in Year 2004. The helicopter was registered with DGCA on 01.02.2008. The helicopter was registered under category 'A' and the Certificate of Registration No. was 3703/2.

The Certificate of Airworthiness Number 4012 under "Normal category" subdivision passenger was issued by DGCA on 01.02.2008. The specified minimum operating crew is one. At the time of accident, the Certificate of Airworthiness was current and was valid up to 10.05.2014. The helicopter was holding a valid Aero Mobile Licence No. A-066/005-RLO (NR) at the time of accident. This helicopter was operated under Operator's Permit No. 01/1991. As on 24<sup>th</sup> July 2013, the helicopter had logged 1860:48 Airframe Hours.

The helicopter and its Engine were being maintained as per the maintenance program consisting of calendar period/ flying Hours or Cycles based maintenance as per maintenance program approved by DGCA.

The last major inspection (24 Months and 150 hrs.) for engine was carried out on 16/07/2013 at 1852:07 airframe hrs. Subsequently all lower inspections, and pre flight checks, were carried out before the release of the helicopter on 19/07/2013. The helicopter has last successfully flown on 23rd July,2013.

The helicopter was weighed on 14/05/2009 at I.G.I Airport, New Delhi. The weight schedule was recomputed on 05/09/2011 and approved by the DGCA. As per the approved weight schedule the Empty weight of the helicopter is 1363.00 kgs. Maximum fuel capacity is 453.10 kgs. Empty weight CG is 3.32 meters aft of datum. As there has not been any major modification affecting weight & balance since last weighing, hence the next weighing is due on 13/05/2014. Prior to the accident flight the weight and balance of the helicopter was well within the operating limits.

Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications has been complied with. Prior to the accident flight there was no pending/repetitive defect entered on the Commander Defect Report/Technical Logbook of the helicopter.

Transit Inspections were carried out as per approved Transit Inspection schedules and all the higher inspection schedules as per the manufacturer's guidelines as specified in Maintenance Program.

The fuel was last drawn for microbiological test on 10.05.2013 and sent to ASHCO LABS, NOIDA. The colony count was within acceptable limits.

#### **1.7 Meteorological information:**

There is no meteorological observatory at either Shri Kedarnath ji or Guptkashi. However at Shri Kedarnath ji the operators flying in the area during yatra period carrying pilgrims have trained few local residents for assessing the visibility by using landmarks in the vicinity of the helipad. Information on cloud base and pattern was also provided by these locals from the helipad. The information was transmitted to the base (Guptkashi) through

mobile phones. At Guptkashi, the crew themselves used to observe the weather and visibility.

On the day of accident, the crew were at Shri Kedarnath ji and as there was no communication from the base or elsewhere, they have assessed the weather themselves. The weather started improving around 1300 hours (IST) and the sun was out around 1400 hours (IST) over Shri Kedarnath ji.

**1.8 Aids to navigation:**

There was no Navigational aid available at Kedarnath Helipad. The VFR flying from Guptkashi to Kedarnath was carried out using ground references. Wind Direction Indicator (windsock) and 'H' marking were available at Guptkashi helipad. There were windsock and "H" marking at Kedarnath helipad also which were washed off during the recent disaster in the area.

**1.9 Communications:**

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

**1.10 Aerodrome information:**

The operational helipad at Kedarnath ji was washed away during the floods and the rescue / relief operations were being carried out from the best clear land patches used as temporary helipads, little away from the location of the earlier operational helipad. The elevation of the area was approx. 11500 feet.

**1.11 Flight recorders:**

Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR) were neither fitted on helicopter nor required to be installed.

**1.12 Wreckage and impact information:**

Some pieces of the fuselage and torn documents were found on the uphill at a distance of approximately 150 feet upslope from the main wreckage. These

pieces were lying adjacent to the broken dead cable in between two poles. The Main Rotor Blade of the helicopter first impacted with the cable running in the area and then with the ground. It had skidded thereafter into the valley and stopped due to an obstruction on the slope before the bank of the river. The helicopter was destroyed.

The wreckage was shifted to Delhi from crash site (Garud Chetti), Shri Kedarnath ji. Examination of wreckage along with inspection of Engine was carried out in February 2016. To ease the transportation, the tail, fuselage, cockpit, main transmission and engine were all brought as separate components.

Following are the major observations:

- The compressor rotor was rotated by hand. Rotation was smooth, with no binding or unusual noises. Inspection of the inlet plenum chamber did not reveal any evidence of ingestion of foreign material or of missing hardware. Inspection of the compressor inlet revealed no visible damage or signs of foreign object ingestion.
- Turbine assembly was free to rotate and no burn marks were visible on exhaust stack pipe.
- The engine to transmission driveshaft assembly was free to rotate.
- There was no burn mark or over heating was visible on combustion chamber assembly.
- Rotor Brake was found in OFF position and rotor brake disc was free to rotate.
- No metal chips were found on free wheel chip detector and traces of oil were present in free wheel assembly.
- Condition of Starter Generator was found satisfactory.
- Traces of oil were present in the engine's accessory gearbox. The oil was clean and bright with no abnormal odour. The engine's accessory gearbox oil filter was opened and examined. It contained clean oil with no apparent debris. The filter element was also free of debris.

- Engine RH side Mag plug was removed and inspected and was found free of debris.
- No. 1 disc pack coupling checked for any crack, delaminating or distortion. No abnormality was observed.
- CEFA fuel and oil filters were removed and checked for contamination and metal particles. There was none and these were free from debris.
- Bottom engine chip detector removed and checked for oil and metal particles. Oil was found free from debris.
- Tail Rotor Gear Box (TGB) chip detector removed and checked for metal particles. None observed.
- The tail rotor head and the blades though were in broken conditions but were attached to the TGB.
- Tail Rotor Gear Box (TGB) was attached to tailboom assembly and mounting nuts checked for safety. The same were found satisfactory.
- Tail Rotor Gear Box (TGB) boot removed to ascertain presence of grease and was found in satisfactory condition.
- Tail Rotor Blade lock nut was found in wire locked condition.
- Tail Rotor controls were free to operate.
- Examination of the components of the tail rotor gearbox did not show any abnormalities. There were no evidences of oil starvation in the TGB.
- Leading edge of target blade (orange) found with a prominent rubbing mark (seems to be hit on a cable) located at approximately 12 inches from the root of the blade and pitch link assembly of the same blade also found in bend condition.
- Checked for signs of damage to the four elastomeric mounts at the corners of the top case of transmission assembly for cracks and deformation. None observed.
- The Main Rotor Hub attached to Transmission Assembly was rotated by hand. Rotation was smooth, with no binding or unusual noises.

### **1.13 Medical and pathological Information:**

No PFMC report was provided to the committee by the Operator. After the accident, though it was informed that post mortem was carried out at helipad.



#### **1.14 Fire**

There was no pre or post impact fire.

#### **1.15 Survival aspects:**

The accident was not survivable.

#### **1.16 Tests and research:**

Nil

#### **1.17 Organizational and management information:**

##### **1.17.1 The helicopter Operator**

The Operator was issued with Air Operator Permit No. 01/1991 (Initially issued on 28.02.1991) which was renewed on 11.03.2013 for Non-Scheduled Air Transport Services. The permit was valid till 28.02.2015. The helicopter was purchased from Hennesey Aviation Dublin, Ireland and inducted by M/s. Sky Airways in January, 2008. The operator is also certified by DGCA of India to maintain the helicopter under CAR-145/CAR-M.

Scrutiny of the copies of the Operations Manual and Safety Manual was carried out by the Committee. The safety manual states that “Ultimate responsibility, authority and accountability for the safety management process lies with the Chairman, Vice President and GM Ops. Each divisional GM has the final responsibility, authority and accountability for the safety process in their division. The responsibility, authority and accountability to carry out the daily safety functions are managed along organizational lines within the department(s) or by special assignment.”

It further states that “The Corporate Safety group is responsible for ensuring that the safety and health management process is established, communicated, implemented, audited, measured and continuously improved for the corporation and divisional key customers.”

The scrutiny of safety manual revealed that it was more or less a copy of the instructions contained in CAR / Regulations. The Operations Manual indicated existence of the personnel / post holders which were not available with the organisation.

As per the Operator, during the period from 01<sup>st</sup> January, 2010 to 24<sup>th</sup> July, 2013, no DGCA Regulatory Audit was carried-out; however following Surveillance Inspections were carried out by the Regional O/o DGCA:

- i. Surveillance of Operations Setup on 24<sup>th</sup> February, 2012.
- ii. Surveillance of Training Records on 05<sup>th</sup> March, 2013.
- iii. Surveillance Inspection of Pre-Flight Medical, Flight Safety Set-up and Ops Office & Dispatch dated 10<sup>th</sup> April, 2013.

The above Surveillance Reports were sent to Operator and Action Taken Report (ATR) obtained which, from the documents, seems to be accepted by the DGCA. The columns of 'whether action taken by Operator Satisfactory' and 'Comments of DGCA' in the non-conformance form(s) available with the operator were blank for all the above Surveillance Reports.

The committee during the course of investigation observed that there is no Operations office or space at / near the airport. The committee was informed that it is being set-up. Subsequently a visit to the operational office of Transbharat at Mehram Nagar was carried out alongwith the FOI (H), DGCA. The operations documents required to be maintained by the NSOP holder were though provided in piecemeal manner but were not complete/ adequate.

On query about the procedures followed to undertake a commitment, the operator has informed that the helicopter was handed over to the State Govt. and was not controlling any operations thereafter. On approaching the State Govt., they informed that only the commitment was told to the operator and had no role in the operational aspect.

### **1.17.2 The State Government – Rescue & relief operations**

On 14<sup>th</sup> and 15<sup>th</sup> June, 2013, there was a heavy non-stop rain in the Kedarnath valley and additional movement of glaciers / landmass from the hills into the valley. This landslide and heavy rain caused destruction of the roads (in hills) joining entry into valley and Shri Kedarnath ji Shrine. The other roads connecting Phata to Gaurikund / Guptakashi were also totally damaged / blocked due to landslides. The level portion in the area being used for parking was also washed away. The entire transit town of Rambada which was being used as reporting point (for helicopter operations) by the helicopters before turning left into the Kedarnath Valley had also washed off. The whole Kedarnath town including the helipads was full of rubble.

Govt. of Uttarakhand, in view of the above natural calamity (APDA), immediately instructed all the helicopters in the valley to carry out rescue operations to the places wherever pilgrims were struck. All the helicopters which were operating shuttles from Phata/Guptakashi to Kedarnath started the rescue operation to bring down the pilgrims from Kedarnath to Guptakashi. Local administrations were based at Guptakashi to take care of the pilgrims coming from Kedarnath for onward transporting / medical assistance. These rescue operations were carried out extensively till 30<sup>th</sup> June 2013. During this period Air Force and army helicopters were also called upon by the state Govt. of Uttarakhand and joined the rescue operations.

It was learnt that by 30<sup>th</sup> June 2013 all the pilgrims and locals stuck at Kedarnath had been evacuated. Thereafter Govt of Uttarakhand had asked all the helicopters of Govt. and Defence to start relief operations which involved food supplies and relief material for neighboring areas of Kedarnath and also transportation of state administration persons to Kedarnath for rehabilitations.

As per the Operator, the procedures for Flight Planning and obtaining ADC / FIC during the period of 'Apda' were performed by the then Operations Manager, who has stated that,

“The flight plans for VT-TBE helicopter were being filed by telephone which was being accepted by Delhi FIC. The Flight plans were filed by calling FIC Delhi and verbally telling them all the details of the flight as per flight plan format and the FIC number was immediately generated and given to us by FIC Delhi.

We had obtained the clearances for the flight from Shehastradhara to Guptakashi and ADC / FIC were sent to the pilot.”

There was no communication between the Pilot and ops team after the helicopter had departed for Guptakashi. There was no communication via telephone also as facilities like mobile towers were also affected due rain.

Govt. of Utrakhand was specifically asked about the procedure of scheduling the helicopters during the relief operation i.e. after 30th June 2013, the control of the operations etc. It was intimated that

On account of the location requirements, operator concerned is informed about the flying requirements. Thereafter, operator undertook the flight commitment. No individual was controlling the operations, since they were located at different locations. The nodal officer / relief commissioner concerned had been issuing the directions.

#### **1.18 Additional information:**

One more helicopter, which was operating for the ‘Apda Operation’ was stuck back on 23rd July, 2013 alongwith the subject accident helicopter. As per the Pilot of the other helicopter,

“Commander of accident helicopter and self were tasked to induct a police team to Kedarnath on 23rd July, the weather was reported clear around 0830 hours and we both got airborne, the first shuttle went through without any problem but after dropping pax at

Kedarnath second time we could not cross Ram Bada as weather deteriorated very fast. The weather did not improve for the rest of the day and we had to do a night halt at Kedarnath, we stayed in the camp established by the police personnel, self and PIC of accident flight spent the night in a two man tent, everything was absolutely normal. The weather remained bad next day morning also, we got ready and waited in the helicopter for the weather to improve. The weather started improving around 1300 hours (IST) and the sun was out around 1400 hours (IST) over Kedarnath. We decided to take off for Guptakashi and in the event of bad weather to land back at camp helipad. I got airborne in VFR conditions; PIC of accident helicopter was to be number two. Crossing Garud Chetti I noticed valley closed beyond Ram Bada, I announced I was turning back due weather and PIC of accident helicopter acknowledged; I turned left and encountered some drifting clouds, keeping ground contact landed back at Camp helipad. Tried to raise PIC of accident helicopter 4-5 times but there was no joy. Police personnel had seen his helicopter other side of the river across drifting clouds. A team of 4 was sent out to locate the crew and helicopter, with in 20 min they located the chopper which had crashed half way between Garud Chetti and river bed on a steep slope.

The bodies were found outside the wreckage. The weather again deteriorated and remained so for the rest of the day. The weather opened up next day morning at 0530 hours (IST) and I de-inducted all the police personnel to Guptakashi, also carried both the bodies from Garud Chetti to Guptakashi. ”

**1.19 Useful or effective investigation techniques:**

NIL

## **2 ANALYSIS**

### **2.1 Serviceability of the helicopter:**

The helicopter was operated under Non-Scheduled Operator's Permit which was valid at the time of accident. The operator is also certified by DGCA of India to maintain the helicopter under CAR-145/CAR-M. The Certificate of Airworthiness was valid. The helicopter was being maintained as per the maintenance program consisting of calendar period/ flying Hours or Cycles based maintenance approved by DGCA. All major inspections and subsequent all lower inspections (Preflight checks, Service Checks, Weekly Checks) were carried out as and when due before the accident.

All the concerned Airworthiness Directive, Service Bulletins, DGCA Mandatory Modifications on this helicopter and its engine has been complied with as on the day of accident. The defect records were scrutinized and there was no defect pending on the helicopter prior to the flight. No Minimum Equipment List (MEL) was invoked prior to the accident flight.

Serviceability of the helicopter has not contributed to the accident.

### **2.2 Crew qualification:**

The helicopter was operated by a single crew as per the type certificate and was fully qualified to undertake the flight. He had valid licence with appropriate endorsements. He had valid Medical certificates for carrying out flying. No documents were available to indicate that Pre Flight Medical check was carried out prior to flight.

The pilot was fully qualified to undertake the flight.

### **2.3 Operator - Flight Operations:**

Scrutiny of the copies of the Operations Manual and Safety Manual was carried out by the Committee. The safety manual was more or less a copy of

the instructions contained in CAR / Regulations. The responsibility, authority and accountability to carry out the daily safety functions were supposed to be managed along organizational lines within the department(s) or by special assignment but was not practically being followed.

During the period from 01<sup>st</sup> January, 2010 to 24<sup>th</sup> July 2013, no DGCA Regulatory Audit was carried-out; however surveillance Inspections were carried out by the Regional O/o DGCA i.e. Surveillance of Operations Setup on 24<sup>th</sup> February, 2012, Surveillance of Training Records on 05<sup>th</sup> March, 2013, Surveillance Inspection of Pre-Flight Medical, Flight Safety Set-up and Ops Office & Dispatch on 10<sup>th</sup> April, 2013.

The non-conformance forms revealed that the findings were not closed in a closed loop manner. The columns of 'Whether Action taken by Operator Satisfactory' and 'Comments of DGCA' in the non-conformance form(s) available with the operator were blank for all the above Surveillance Reports. The Operations Manual though indicated existence of the personnel / post holders which were actually not available with the organisation.

The operations documents required to be maintained by the NSOP holder were being provided to the Committee in piecemeal manner and were not complete. It was observed that there is no Operations office or space at / near the airport, a visit to the newly acquired operational office of operator was carried out alongwith the FOI (H), DGCA. Initially it was not upto the mark but during investigation, it was confirmed by FOI (H) that the suggested improvements have been made by the operator.

The operator has informed that the helicopter was handed over to the State Govt. and was not controlling any operations thereafter. State Govt. on the other hand informed that only the commitment was told to the operator and had no role in the operational aspect. There was no clear cut demarcation about the operational jurisdiction of the helicopter.

## **2.4 Relief operations - Management supervision & control**

In June, 2013, there was total destruction of the roads (in hills) joining entry into valley and Shri Kedarnath ji Shrine. The other roads connecting Phata to Gaurikund / Guptakashi were also totally damaged / blocked due to landslides. The whole Kedarnath town including the helipads was full of rubble. Govt. of Uttarakhand, in view of the above natural calamity (APDA), immediately instructed all the helicopters which were operating shuttles from Phata/ Guptakashi to Kedarnath in the valley to carry out rescue operations to the places wherever pilgrims were struck. All the helicopters started the rescue operation to bring down the pilgrims from Kedarnath to Guptakashi. These rescue operations were carried out extensively till 30<sup>th</sup> June 2013. Thereafter Govt of Uttarakhand had asked all the helicopters to start relief operations which involved food supplies and relief material for neighboring areas of Kedarnath and transportation of state administration persons to Kedarnath for rehabilitations.

The accident helicopter was also carrying out relief operations. The procedures for Flight Planning and obtaining ADC / FIC during the period of 'Apda' which continued during relief operations also were performed by the then Operations Manager, who has stated that, "The flight plans for VT-TBE helicopter were being filed by telephone which was being accepted by Delhi FIC. The Flight plans were filed by calling FIC Delhi and verbally telling them all the details of the flight as per flight plan format and the FIC number was immediately generated and given to us by FIC Delhi. We had obtained the clearances for the flight from Shehastradhara to Guptakashi and ADC / FIC were sent to the pilot."

It was informed that there was no communication between the Pilot and operation team after the helicopter had departed for Guptakashi. There was no communication via telephone also as facilities like mobile towers were also affected due rains & floods. Govt. of Uttarakhand informed that on account of the location requirements, operator concerned is informed about the flying requirements. Thereafter, operator undertook the flight commitment.



No individual was controlling the operations, since they were located at different locations. The nodal officer / relief commissioner concerned had been issuing the directions. During relief operations there could have been a better management, supervision and control of the helicopter operation.

## **2.5 Weather & Circumstances leading to the accident:**

No meteorological observatory is available either at Shri Kedarnath ji or Guptkashi. For normal flights during Shri Kedarnath ji operations, the operators have trained few local residents at Shri Kedarnath ji for assessing the visibility by using landmarks in the vicinity of the helipad. Information on cloud base and pattern is also provided by these locals from the helipad. The information was transmitted to the base (Guptkashi) through mobile phones.

At Guptkashi, the crew themselves used to observe the weather and visibility.

On 23rd July, the weather was reported clear around 0830 hours IST and the helicopter operated a shuttle which went through without any problem but after dropping passengers at Kedarnath second time the helicopter could not cross Ram Bada as weather had deteriorated very fast. The weather did not improve for the rest of the day and the helicopter did a night halt at Shri Kedarnath ji.

The weather remained bad next day morning and started improving around 1300 hours (IST) and the sun was out around 1400 hours (IST) over Shri Kedarnath ji. The helicopter though took off for Gupt kashi but after crossing Garud Chetti, found valley was closed beyond Ram Bada. There were some drifting clouds. The pilot of helicopter decided to return but could not make it to the helipad. It had gone to the left of valley where it hit the dead cable running on the hill. The leading edge of target blade (orange) was having prominent Scratch marks (seems to be hit on a cable) located at approximately 12 inches from the root of the blade with pitch link assembly of the same blade found in bend condition.

### **3 CONCLUSION:**

#### **3.1 Findings:**

1. The operator was carrying out operation of helicopter under NSOP and the maintenance of helicopter under CAR 145.
2. The Certificate of Airworthiness and the Certificate of Registration of the helicopter was valid on the date of the accident.
3. The certificate release to service (CRS) was valid at the time of accident.
4. The defect records were scrutinized and there was no defect pending on the helicopter prior to the flight.
5. The PIC was holding a valid license on the type of helicopter.
6. No regulatory audit of the Organisation was carried out between 01<sup>st</sup> January, 2010 to 24<sup>th</sup> July, 2013.
7. Govt. of Uttarakhand, in view of the natural calamity (APDA) had instructed helicopters which were operating shuttles from Phata/Guptakashi to Kedarnath in the valley to carry out rescue operations to the places wherever pilgrims were struck.
8. These rescue operations were carried out extensively till 30<sup>th</sup> June 2013.
9. Thereafter Govt of Uttarakhand had asked all the helicopters to start relief operations which involved food supplies and relief material for neighboring areas of Kedarnath and transportation of state administration persons to Kedarnath for rehabilitations. The accident helicopter was one of these helicopters.
10. The flight plans were being filed by telephone and were accepted by Delhi FIC. Clearances for the flight from Shehastradhara to Guptakashi and ADC / FIC were obtained.

11. On 23rd July 2013, the helicopter operated a shuttle from Guptkashi to Shri Kedarnath ji but after dropping passengers at Shri Kedarnath ji second time the helicopter could not cross Ram Bada as weather had deteriorated very fast.
12. The weather started improving around 1300 hours (IST) on the next day and the sun was out around 1400 hours (IST) over Shri Kedarnath ji.
13. The helicopter took off for Guptakashi but after crossing Garud Chetti, valley was found totally packed (visibility very poor) beyond Ram Bada. There were some drifting clouds.
14. The pilot of helicopter decided to return but could not make it to the helipad. It had gone to the left of valley where it hit the dead cable running on the hill.
15. The leading edge of target blade (orange) was having prominent rubbing marks (seems to be hit on a cable) located at approximately 12 inches from the root of the blade with pitch link assembly of the same blade found in bend condition.
16. There was no documentation indicating the duties and responsibilities of the operator and State authorities (loaner/hirer) regarding operation of leased helicopters during relief operations.
17. The relief operation could have been more organized from safety point of view as it does not involve life saving missions.

### **3.2 Probable cause of the accident**

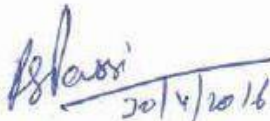
The helicopter after taking off in marginal weather, encountered sudden severe bad weather and while turning back hit the dead cables across the hills resulting into impact with the sloping hill sustaining substantial damages.

## **4. SAFETY RECOMMENDATIONS**

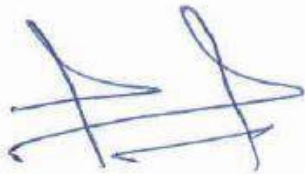
- 4.1 Contingency plan of the State Governments to handle these kinds of disaster especially floods in the hills wherein helicopter deployment is the only mode of

rescue be prepared / modified with elaborate procedures and may be accepted by the DGCA in association with the State Disaster Management Plan.

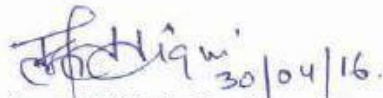
- 4.2 DGCA may issue requirements of defining the distribution of responsibilities of the operator and the hirer concerning safe operation of the helicopter in case the helicopter is given on hire.
- 4.3 DGCA may ensure that a regulatory audit of the small operators particularly carrying out hill flying is mandatorily done as per the CAR on the subject to ensure compliance of the basic safety and regulatory requirements by the operator.



R.S. Passi, Chairman  
Committee of Inquiry



P.K. Chabri, Member  
Committee of Inquiry



Nadeem Siddiqui, Member  
Committee of Inquiry

DATE  
PLACE

30/4/2016  
NEW DELHI

While accepting the investigation report vide MoCA letter no. AV-15013/8/2015-DG dated 15.06.2016, the Government has amended the recommendation no. 1 to be read as;

**“Contingency plan may be prepared/modified by the State Governments to handle these kinds of disaster especially floods in the hills wherein helicopter deployment is the only mode of rescue in consultation with the DGCA.”**