FINAL INVESTIGATION REPORT
ON ACCIDENT TO AIRBUS AS350 B3 HELICOPTER VT-HDX
AT MOLDI VILLAGE ON 21st AUGUST 2019.

GOVERNMENT OF INDIA
MINISTRY OF CIVIL AVIATION
AIRCRAFT ACCIDENT INVESTIGATION BUREAU

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 2017, the sole objective of the investigation of an accident/serious incident is prevention of accidents and incidents and not to apportion blame or liability. The investigation conducted in accordance with the provisions of the above said rules is therefore separate from any judicial or administrative proceedings to apportion blame or liability. This document has been prepared based upon the evidences collected during the investigation, opinion obtained from the experts. Consequently, the use of this report for any purpose other than for the prevention of future accidents or incidents could lead to erroneous interpretations.

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FINAL INVESTIGATION REPORT ON ACCIDENT TO
M/s HERITAGE AVIATION PVT. LTD. AS350 B3 HELICOPTER VT-HDX
AT MOLDI ON 21st AUGUST 2019

1.	Aircraft	Type	Airbus H125 (AS350B3)
		Nationality	Indian
		Registration	VT-HDX
2.	Owner &		M/S QUANTUM INVESTMENTS LTD
3.	Operator		M/s Heritage Aviation Pvt Ltd
4.	Pilot		CPL(H) Holder
	Extent of Injuries		Fatal
5.	No. of Passengers on board		02
	Extent of Injuries		Fatal
6.	Date & Time of Accident		21st August 2019
7.	Place of Accident		Moldi, Uttarkashi District
8.	Co-ordinates of Accident Site, AMSL		31°03'21.85"N 77°51'19.31"E
9.	Last point of Departure		Moldi, Temporary Helipad
10.	Intended landing place		Arakot Temporary Helipad
11.	Type of Operation		Non-Scheduled – Relief Operations
12.	Phase of operation		En-route – Climb
13.	Damage to the helicopter		Destroyed
14.	Type of Accident		Cable Hit

(All the timings in this report are in UTC unless otherwise specified)

SYNOPSIS

On 21st August 2019, Airbus H125 (AS350B3) helicopter VT-HDX of M/s Heritage Aviation Pvt Ltd met with an accident while operating a relief flight in Uttarkashi district of Uttarakhand State. The helicopter was under the command of a CHPL holder (PIC). There were two more occupants on board the helicopter. All three on board received fatal injuries. The helicopter was destroyed due to impact with hills and subsequent fire.

After dropping the relief material at Mori, the helicopter had landed at helipad in Moldi village. The helipad (East – West as per the 'H' Marking on ground) at Moldi village was temporarily created by cutting the crop by the villagers & local administration in the morning of the date of accident.

The helicopter took off and during climb stuck the trolley cables running across the valley in N-S direction. The weather was clear in the valley and no gust/ turbulence was reported by other pilots operating in the area at that time. All the three occupants received fatal injuries. The helicopter was destroyed.

Director General, AAIB appointed Sh. R. S. Passi, Director, AAIB as Investigator – In – Charge & Capt. P.K. Chabri, as Investigator to investigate into the probable cause(s) of the accident, vide Order No. INV.11011/03/2019-AAIB dated 22nd August 2019 under Rule 11 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2017.

1 FACTUAL INFORMATION

1.1 History of Flight

On 21st August 2019, Airbus H125 (AS350B3) helicopter VT-HDX of M/s Heritage Aviation Pvt Ltd met with an accident while operating a relief flight in Uttarkashi district of Uttarakhand State. The helicopter was under the command of a CHPL holder (PIC). There were two more occupants on board the helicopter. All three on board received fatal injuries. The helicopter was destroyed due to impact with hills and subsequent fire.

The helicopter was being used for Relief Operations in Uttarkashi District because of Natural Calamity (Floods) in that area. The relief operation was under the control of the Local Administration (District Magistrate of the district). Based on the requirement, the helicopters of private Non Scheduled Operators were assigned to respective District Magistrates for carrying out relief operations. The helicopter operators were then informed by the local administration about the requirements regarding dropping of relief material. The overall responsibility of operations and safety of helicopter, however, remained with the helicopter operator and the crew of the helicopter.

The relief flights to the villages uphill in the area were being operated from temporary helipad at Arakot and VT-HDX was assigned for the purpose.

After carrying out pre-flight inspection, the helicopter VT-HDX was accepted by the pilot at Dehradun (Sahastradhara Helipad). The pilot had also undergone pre-flight medical examination and his BA test was found negative.

The helicopter took off from Sahastradhara Helipad and landed at Arakot. After landing at Arakot, the pilot took briefing from local authorities about the relief flights, weather, relief materials to be taken, the location of the helipads i.e. co-ordinates of the helipad.

The PIC was required to operate relief sortie by VT-HDX from Arakot to Mori village and then Moldi village. The helicopter was loaded with the required relief material and it took off uneventfully from Arakot. After dropping the relief material at Mori, the helicopter landed at helipad in Moldi village. The helipad (East – West as per the 'H' Marking on ground) at Moldi village was temporarily created by cutting the crop by the villagers & local administration

in the morning of the date of accident. There exists a transformer pole in the eastern direction next to the helipad. There are hills in the southern and northern directions of the helipad. In the southern direction of the helipad, there are houses of approximately 20 feet height and very close to the helipad.

As per the eyewitnesses at Moldi, the helicopter had approached from the east, overflew the helipad and proceeded to the west of helipad. After turning 180 degrees, it landed at Moldi helipad in the easterly direction. The landing was uneventful and the helicopter off loaded the relief material at the helipad.

Thereafter, the helicopter took off and during climb stuck the trolley cables running across the valley in N-S direction. The villagers heard two sounds, first of impact with the wires and second of impact with the hill. As per these villagers, the helicopter caught fire on impact with the hill and came down rolling to the base of the hill. The weather was clear in the valley and no gust/ turbulence was reported by other pilots operating in the area at that time.

The villagers and the SDRF team working in that area ran towards the crash site and found that all three occupants have received fatal injuries. The helicopter was destroyed.

1.2 Injuries to Persons

Injuries	Crew	Passengers	Others
Fatal	01	02	NIL
Serious	NIL	NIL	NIL
Minor/ ~~None~~	NIL	NIL	NIL

1.3 Damage to Aircraft

The helicopter was destroyed during the accident. Damages are as below:-

A tail rotor blade in full with consequential impact damages

Sheared off tail rotor blade

The tail portion otherwise suffered minimal damages (only during rolling down hill)

Cockpit portion

Main Rotor Blade (Blue) (location disturbed during rescue operation)

1.4 Other Damage

Nil

1.5 Personnel Information

1.5.1 Pilot – In – Command

Age	54 years
License	CHPL
Date of Issue	23rd Feb. 2009
Valid up to	22nd Feb. 2024
Category	Helicopter
Class	Single engine
Date of Class I Med. Exam.	23rd July 2019
Class I Medical Valid up to	20th Jan. 2020
Date of issue FRTOL License	23rd Feb. 2009
FRTO License Valid up to	22nd Feb. 2024
Endorsements as PIC	23rd Feb. 2009
Total flying experience	5427 hours
On type	2954 hours
PIC on type	2500 hours
during last 1 year	489.40 hours
during last 180 days	257.35 hours
during last 90 days	140.05 hours
during last 30 days	22.00 hours
during last 07 Days	Nil**
during last 24 Hours	Nil**
Rest period before flight	10 days
Involved in Accident/ Incident earlier	No

** Excluding flying time of the day of accident

1.6 Helicopter Information

Helicopter Model	Airbus H125 (AS350B3)
Helicopter MSN	7961
Year of Manufacturer	2015
Name of Owner	Quantum Investments Limited
C of R	4584
C of A	6694
C of A Validity	Subject to valid ARC
A R C issued on	24th July 2019
ARC valid up to	23rd July 2020
Total Helicopter Hours	2785
Last major inspection	600 hours
Engine Type	Arriel 2D
Engine Sl. No.	50604
Last major inspection	800 hours
Total Engine Hours Since New	2785

The helicopter was registered in “Normal” category & Sub Division - “Passenger”. Pre-flight inspection was carried out before the first flight on the day of accident. All concerned Airworthiness Directives, mandatory Service Bulletins and DGCA Mandatory Modifications on the helicopter and its engine have been complied with as on the date of accident. Scrutiny of the Technical Log Book revealed that, there was no snag pending on the aircraft prior to the accidented flight.

1.7 Meterological Information

There is no Meteorological (MET) office situated at Arakot and nearby areas where the helicopter was operating. Pilot obtained MET information from UCADA prior to take-off from Dehradun and than made a self assessment at Arakot. The visibility was 5 kilometers with clear skies. All the hill tops were visible.

1.8 Aids to Navigation

No navigational aids were available at Temporary helipads other than a letter "H", marked on ground which was visible from air.

1.9 Communication

The temporary helipads were uncontrolled. As such at the time of accident, the helicopter was not in contact with any ATC unit. The local authorities informed the operator about the accident.

1.10 Aerodrome Information

The helipads were used to supply flood relief items to the flood affected areas and also for ferrying passengers mostly people who required immediate

medical attention. The co-ordinates of the Arakot helipad are 31°02'29" N, 077°49'46" E with elevation of approx. 4300 feet.

MOLDI HELIPAD

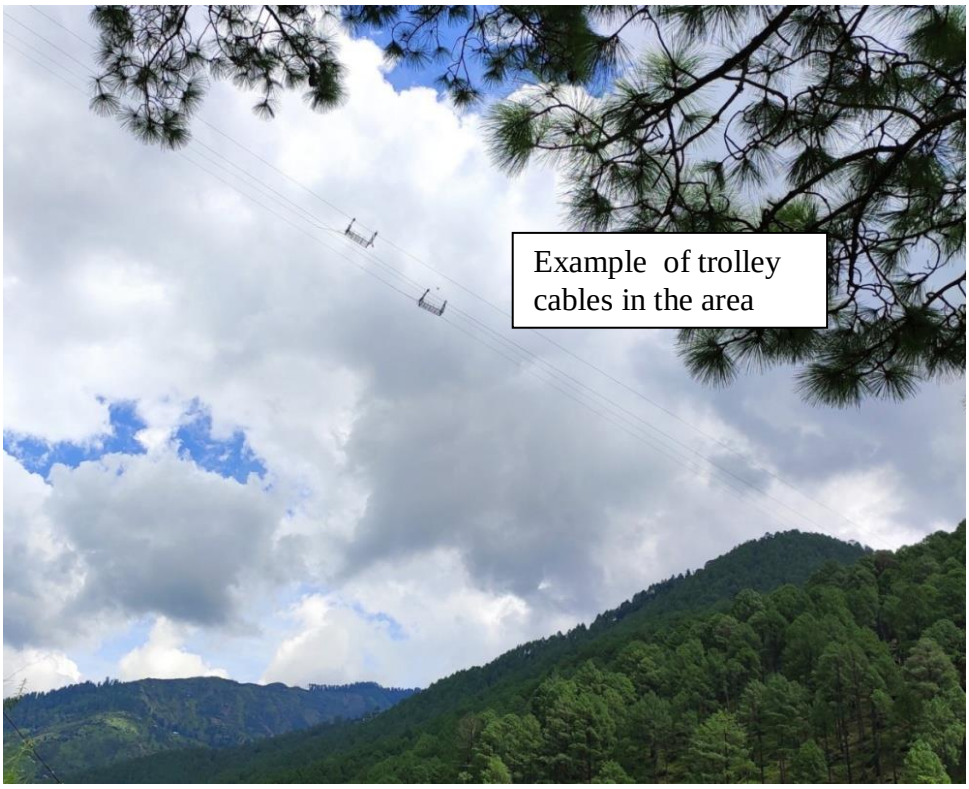
The co-ordinates of the Moldi helipad are 31°03'17" N & 77°51'30" E

1.11 Flight Recorders

Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR) were neither fitted nor required as per existing Civil Aviation Requirements.

1.12 Wreckage and Impact Information

The helicopter took off from a helipad where there was no possibility of taking off in the forward direction because of a pole in front and power cable running on one side with houses on other side.



The main rotor blades had hit the cable. One of the main rotor blade got entangled with the cable causing spiral turns in the cable as shown below.

Rubbing marks of trolley cable on LE of main rotor blades

Damages suffered by Yellow and Blue main rotor blades (above)

Close up of the portion of leading edge of main rotor blade blue entangled with trolley cable (below)

The helicopter started rotating while hanging on cable and pulled the cable forward due to engine thrust and inertia. The cable gave way and helicopter was thrown away as from a catapult.

The helicopter hit a hill in the right side of valley.

The debris rolled down from the hill and finally stopped at base of foothill. The main fuselage was totally crushed and suffered fire damages. The tail rotor and aft portion suffered minimum damage. One of the tail rotor blades was broken at 35% of its length (from root) and the other blade was of full length. Both pitch change mechanism and TGB mechanism were working satisfactorily. The red main rotor blade had sheared off close to the root section. The blue main rotor blade though attached with the MGB star flux, however, was broken at approximately 470 centimeters from the root and was having soot formation near the broken portion. The yellow main rotor blade also had broken away at a distance of 465 centimeter from the root section.

1.13 Medical & Pathological Information

The pilot had undergone pre-flight medical (Breath Analyser Test) at Sahastradhara before operating first flight of the day as per requirement of CAR Section 5, Series F, Part III. The BA test report was negative.

1.14 Fire

The helicopter caught fire after impacting with the hill.

1.15 Survival Aspects

The accident was not survivable.

1.16 Test & Research

Nil

1.17 Organisation & Management Information

1.17.1 Heritage Aviation Pvt Ltd.

The helicopter was operated by Heritage Aviation Pvt Ltd. holding Air Operator Permit (AOP) No. 04/2015 for Non-Scheduled Air Transport Services which was valid till 10.01.2022. As per the AOP, the operator had a fleet of 7 aircraft. As per AOP, these aircraft were permitted for Commercial Air Transport in Passenger category. The maintenance of the helicopter was carried out by another DGCA approved MRO.

Following are the relevant points of the organization, for the investigation of present accident:-

- The operator had got necessary approvals for the Manuals and for the post holders barring approval of Chief of Flight Safety. Intimation of the name of a person proposed to be appointed as Chief of Safety was though sent to DGCA but no formal request in appropriate Performa for approval was submitted by the operator.
- Though the Chapter in Operations Manual contains all requirements for mountain flying as per CAR, but there is no specific SOP or procedures laid down for General mountain flying or for relief operations by the operator.
- No MoU/ Agreement was signed for the flood relief operations but UCADA had communicated through email to heritage to carry out the flood relief operations.
- Though it is submitted by the Operator that Risk Mitigation is carried out by CFS for all flights, but it was not done in the said operation/ flight. The reason given was due to urgency and paucity of time. During discussions with the Chief of Flight Safety, it was found that he was not aware of the Operations Circular issued by DGCA.

The helicopter had flown to Moldi to drop relief material, which was verbally communicated by the local administration. As per the procedure followed, these changes in flight are on verbal instructions of local administration and were followed without any change in the flight plan. However, in the evening, actual sorties flown are logged and documented.

1.17.2 DGCA

(A) CAR Section 4 Series B Part II -
Minimum Safety Requirements for Temporary Helicopter Landing Areas.

DGCA had issued a CAR which gives the minimum safety requirement (necessary) for helicopter landing areas which are not located at an airport and is used temporarily for helicopters engaged in chartered/ private flight operation.

The CAR states: -

> *"Before undertaking any such flight, the helicopter operator and/ or his pilot must satisfy himself by his physical inspection on ground/ air and/ or obtaining required information from District authorities that surroundings are free from obstacles and the site suitable for operations of type of helicopter being operated and there is sufficient open space to force land, if necessary."*

and

> "*Helicopter operator through their Accountable Manager shall be responsible for the safety of helicopter operations, passengers and people on ground*."

Para 4 of the same CAR gives "Site Requirements" i.e. minimum size (requirement of the area), Markings, Wind Direction, Safe Area, etc. which should be met in order to perform safe operations from temporary helipads.

(B) DGCA Operations Circular 7/2013
- Utilisation Of Helicopters in Disaster Management.

DGCA had issued an Operation Circular specific to 'Utilisation of Helicopters in Disaster Management (DM)' after the flash floods in Uttarakhand in the year 2013 where Civil/ Military registered helicopters were used for relief operations and some of these were involved in serious incidents or accidents. The circular provides instructions/ guidelines for utilisation of helicopters for the purposes of Disaster Management to be followed by Requisitioning Authority / State Governments, DGCA, Operators and other stake holders participating in Disaster Management.

In this circular, it is appreciated that during disasters, there will be breakdown in telecommunications which leads to lack of coordination between helicopter operators and State/ local administration. Following is the relevant information contained in the Circular:-

Without interfering in the Disaster Management scheme or in the functioning of State Governments, the circular recommends guidelines for all Stake holders. Relevant ones are as enumerated below:-

- States to encourage/ ease construction of helipads in the State and simplify helicopter movement procedures for their regular use.
- States to formulate procedures and modalities for requisitioning and chartering civil helicopters and aeroplanes during disaster.
- State Govts would formulate a detailed working plan based on the above guidelines.

The circular specifically emphasizes the role of DGCA in ensuring Safety of aircraft operations and as a facilitator without interfering with NDMA or State DMA scheme of things. DGCA would provide all assistance to the RA/ State Govts to ensure quick response along with optimum and safe utilization of all aviation assets during DM. Relevant aspects which DGCA can facilitate are:-

a) Advice State Aviation Cells to integrate aviation resources in their Disaster Management Scheme.

b) Provide Flight Operations Inspectors (FOIs) during the calamity to be collocated with State DMA and at site of disaster, to assist in the following:-

- Interaction with State Government.
- Ensure safety of helicopter operations and flying during adverse conditions. Flight safety would be top priority at all times.
- Assist in preparation of landing grounds/ helipads.
- Safety and security of helicopters, landing grounds, etc. so that people do not crowd helicopters leading to inadvertent accident / incident.
- Disseminating information to all operators and pilots about the following:
  - Weather in different valleys, routes and in different regions.
  - Conditions of existing helipads and landing grounds.

As per the circular, DDG-FSD should ensure detailing of FOIs to disaster site for the above purposes. The circular also mentions that ‘Operators’ would undertake all flights within the realms of pilot’s and helicopter’s abilities, without jeopardizing safety. While tasking, operators should give due

consideration (for safety) when single pilot operates in difficult terrain. Flying during Disaster Management should not be treated (by the operator) as an 'Opportunity' but an 'Aid'. As responsible entities, Operators need to further define their roles themselves during Disaster Management and ensure compliance. It is specifically mentioned to have balance between 'Flight safety' and 'Mission accomplishment' keeping flight safety of paramount importance. FOI co-opted with State Disaster Management will ensure, flight planning and its execution in coordination with other bases.

1.17.3 Uttarakhand Civil Aviation Development Authority (UCADA) & Uttrakhand State Disaster Management Authority (USDMA)

Uttrakhand State is highly vulnerable to various natural and man-made disasters. The State has also formed Uttrakhand State Disaster Management Authority (SDMA). Apart from counteracting at the time of disasters, the State and District Disaster Management Authorities are also responsible for the reconstruction and reestablishment of work before and after the disaster. The state issues guidelines to all related departments about the preparations work to be undertaken before the disaster and monitoring of completed work in the perspective of State Disaster Management.

Uttarakhand Civil Aviation Development Authority (UCADA) was incorporated by Government of Uttarakhand in the year 2013, with the objective to develop civil aviation sector in the state on a sustainable model. The preamble of UCADA is to provide safe, convenient, economical and efficient air travel to all parts of the State.

The SDMA has issued an SOP and one of the purposes of the SOP is to develop coordination among different departments for immediate and effective relief and rescue work during the disaster. The SOP requires that some activities should be undertaken before disaster, i.e "Preparatory Actions". Under "Resource Mapping", following requirement is given:-

> Temporary and permanent helipad and the runway will be maintained with the coordination of Public Works Department and civil aviation department according to the guidelines of updated IRS of State Disaster Management Authority.

It is also required that,

> District Disaster Management Authority (DDMA), under the direction of the SDMA, will develop calendar for mock drills trainings and awareness generation activities in accordance with weather conditions and stakeholder's needs.

In addition SOPs have been issued by Department of Transport & Department of Police, Uttrakhand. These two SOPs are standalone SOPs and do not have any mention of co-ordination with UCADA or private helicopter operators, nor there was any information if any mock drill was carried out at any level with the association of these operators.

1.18 Additional Information

Eye witness statements:-

Villagers of the Moldi village had observed the landing of helicopter as well as its take off from the Modi helipad. Discussions were carried out with these people and following are the relevant facts: -

1. The helicopter had approached from the east, overflew the helipad and proceeded to the west of helipad and then landed at Moldi helipad in the easterly direction. The landing was uneventful and the helicopter off loaded the relief material at the helipad.
2. The helipad was made in the morning of the day of accident by cutting the paddy crop in the paddy field. This was the first landing and take-off of any helicopter in the village.
3. The landing and subsequent take off, after off loading the relief material was between 10:30 hours IST and 1100 hours IST. The road used by motorized vehicles passing through the village is at approximately 15 meters from the helipad.
4. The distance of crash site from the village was less than 500 meters.
5. The weather at the time of landing and take-off was clear at helipad and in the valley.
6. The helicopter took off in the westerly direction and struck the cables running across the valley in N-S direction.
7. During takeoff, the helicopter had also gone in the backward direction and after reaching 6 to 7 meters of height, it initiated 180° degrees turn.

8. They heard two sounds, first on impact with the wires and second on impact with the hill. The helicopter caught fire on impact and crashed into the base of the hill.

For a layman, a helicopter should arrive at a landing spot vertically and lift off the ground vertically. Lifting off backwards, however, was curious thing for the villagers. In the present case, the eyewitnesses (villagers) have very keenly observed the lift off and were amused that it lifted off in the backward direction.

1.19 Useful or Effective Investigation Techniques

Nil

2 ANALYSIS

2.1 General

- The helicopter was having a valid Certificate of Registration (C of R) at the time of accident. It was holding a valid Indian Certificate of Airworthiness (C of A) under Normal category with Passenger/ Aerial as Sub-Division. The C of A was valid for lifetime. Airworthiness Review Certificate (ARC) was valid at the time of accident. There was no snag reported by the pilot before the accidented flight.
- All concerned Airworthiness Directives, mandatory Service Bulletins, and DGCA Mandatory Modifications were complied with as on date of accident.
- The weather at the time of accident was fine.
- The Pilot – In – Command was qualified to operate the flight. PIC had a total flying experience of about 5427 hrs. with 2954 hrs. on type. His medical and all trainings were current as on the date of occurrence. The PIC had sufficient experience in Hill flying and had flown in Uttarakhand region earlier. As per the records available, he fulfilled all qualifications and recurrent training requirements for hill flying operations as per DGCA CAR.

2.2 Wreckage Examination

Onsite examination of the wreckage was carried out. The wreckage was though disturbed for the purposes of rescue and retrieval of bodies, but there was no major additional damage or cutting of the helicopter parts. The fuselage including the nose portion, instrument panel and controls were destroyed due to fire. The engine was found separated from the helicopter and totally crumpled. The tail portion suffered damages only while the helicopter rolled down the hill after impact.

The helicopter on completion of 180° turn after take off (OGE), impacted the trolley cable while it was in climb mode. The main blades were rotating at full rpm. From the damage to the main rotor blades, it is evident that blue bade was the last to hit the cable as it got and remained entangled with the cable till the breakage of cable. The yellow blade which is ahead of blue blade had got

sheared off from almost the same distance at which the blue blade had impacted the cable. The red blade which was the first to impact took the maximum impact load and got detached from the attachment points at star flex. The patterns of cable rub marks on blue and yellow blades indicated that the cables had rubbed with these blades from tip to root side.

2.3 The Relief Operations

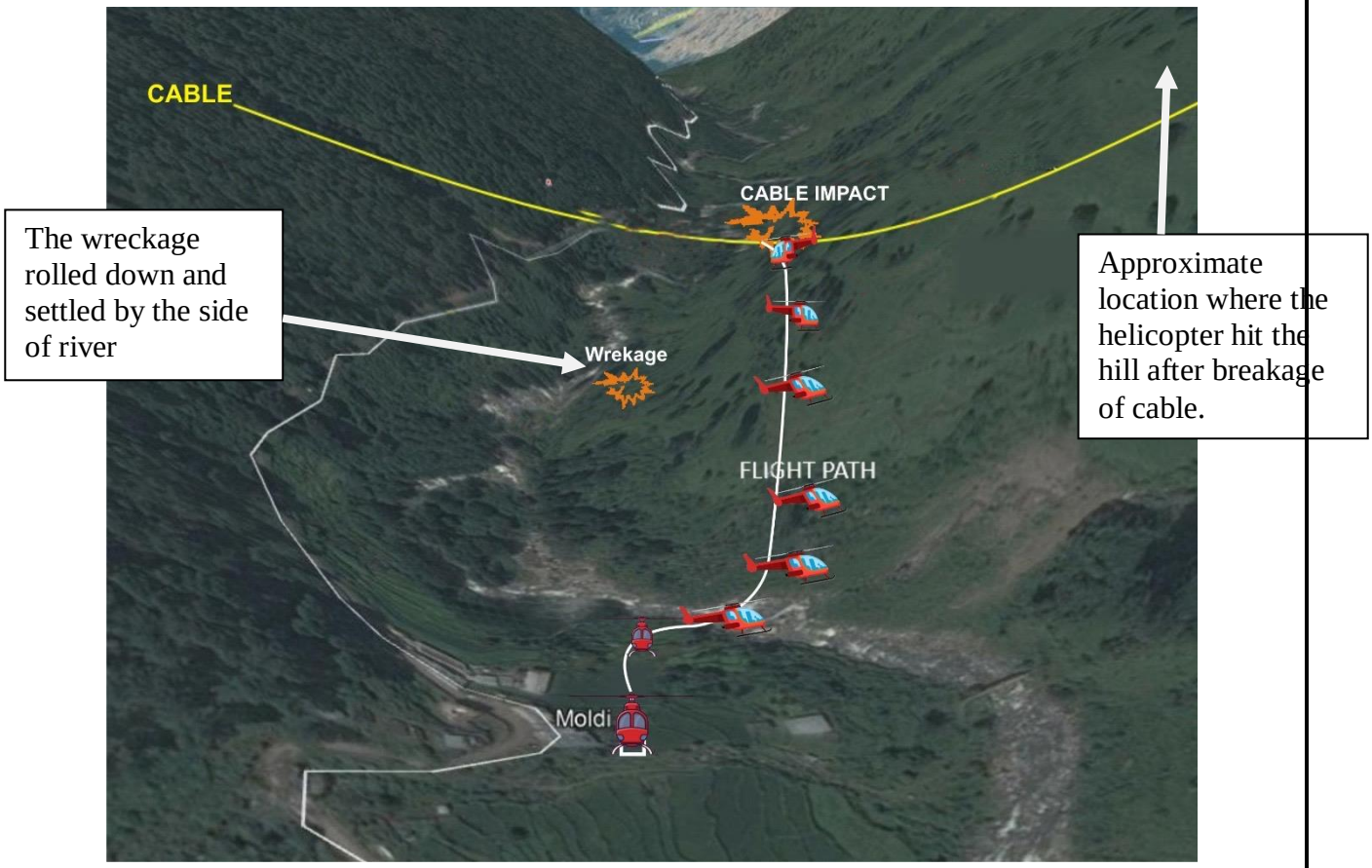
Hill flying becomes more challenging particularly during Disaster Relief and Rescue Operations. Uttarakhand State geographically is disaster prone and has seen disasters frequently, though the scale of disaster may vary. State as of now does not have any dedicated helicopter for the purpose or equipped with the requisite equipment such as winch or cargo sling. Larger portion of helicopter relief operations is catered by helicopters operated by Non Scheduled Operators. There have been fatal & Non fatal accidents during these operations. Based on the recommendations of the investigation reports of the earlier accidents or otherwise, DGCA is required to take action so that the damage and injury can be minimized during future operations.

DGCA had issued an Operations Circular for utilization of helicopter in Disaster Management after the previous "Aapda" in Uttarakhand in year 2013, which is not a legislation or Regulation and per-se is not binding on the stake holders. The operators, however, are expected to follow the contents of such circular for the sake of safety of helicopter and its occupants. The safety requirements laid down in this circular were neither being followed by the operator nor by UCADA. DGCA (FoIs) were having a specific role during relief operation and this was not performed. The relevant observations are:-

- The operator or crew had not satisfied themselves that the surroundings were either free from obstacles or were appropriately identified.
- The apple cart cables which used to come on and off for transportation of apples from one hill to other were not marked.
- The temporary helipad at Moldi was prepared in the morning of the day of accident and was not fulfilling the minimum safety conditions.
- Working plan or procedure formulated by UCADA/ State for requisitioning of helicopters did not cover the safety aspects.

- DGCA (FoIs) have not facilitated state during relief operation as elaborated in the operations circular on the subject.
- "Mission accomplishment" took preference to "flight safety" during relief operation. DGCA has tacitly referred to this aspect in the circular and advised operators not to treat the disaster as an opportunity.
- No evidence was available that PWD and UCADA had coordinated in maintenance of temporary helipads as required by SOP of SDMA.
- NSOP holders or UCADA was not involved in any of the mock drills carried out by SDMA.

2.4 Circumstances Leading to the Accident



The investigation team had series of discussions with State Civil Aviation and Administrative authorities on the procedure followed for requisitioning the helicopter for flood relief operations. As and when the requirement of a helicopter arises, UCADA approaches the helicopter operators for providing their helicopter for the said requirement. On receipt of the helicopter, it is

assigned to the respective District Magistrate under whose jurisdiction the relief operation is to be carried out.

In the present case also, helicopter and crew were requisitioned and the accidented helicopter flew from S'Dara (Dehradun) to Aarakot. It was under the administrative control of the District Magistrate for utilization as per his requirement. On the date of accident, the helicopter was asked to carry out relief flight from Aarakot to various villages uphill.

The pilot was briefed to offload relief material at Mori and Moldi villages. The information about the landing helipads (Latitude & Longitude) were provided by the local administration. The local villagers use trolley cables to transport apples from hill on one side of the valley to hill on the other side of valley near the road. These cables are not having any indications (flags, marker balls etc.).

The helicopter took off from Aarakot helipad with relief material and after dropping the relief material at Mori took off for Moldi. Moldi helipad was made in the morning of the day of accident. The PIC had not seen Moldi helipad. The helipad was not meeting any of the safety requirements.

The PIC had huge experience and was flying in the area continuously for the last 5 to 6 years. He had also flown during earlier relief operations. Looking at the experience of the PIC in the hills made him complacent about the flight to Moldi & back. He had carried out approach in the area of the trolley cable during landing into Moldi, but missed the sight of cable because he had to search small helipad in the village during crucial phase of flight.

The helicopter landed at Moldi and with the rotors running, off loaded the relief material. The pilot had not come out of the helicopter. A transformer pole existed in the forward direction (easterly) and a few houses in the surrounding area (easterly, southerly and westerly direction) of the helipad. PIC had therefore already decided to take off in the westerly direction but the helicopter was parked facing east, which meant he was to take a 180 degrees turn after attaining safe height. Keeping this in mind, he should have come out of the helicopter at Moldi to have a look for cables etc. in the flight path.

All of the above indicates that during the relief/ rescue operations, 'Flight safety' took a backseat in comparison to 'the Mission accomplishment'. Safety was compromised for Productivity indicating failure of SMS at ground level.

On attaining safe height, after takeoff backwards, the helicopter initiated left turn while continuing the climb in order to proceed in the westerly direction. As he was occupying the right seat, his vision towards left was hindered and made it further difficult for him to spot the cable. Just after completion of 180° turn, it impacted the trolley cable which was running in the North-South direction. The trolley cable broke due to entanglement with helicopter main rotor blades (near root). All main rotor blades suffered damages. The helicopter was thrown away in Northerly direction. Other damages were consequential as it hit a hill top and caught fire while rolling down the hill. The helicopter was destroyed due impact and fire. .

3 CONCLUSION

3.1 Findings

3.1.1 The operator was holding a valid AOP for Non-Scheduled Air Transport Services.

3.1.2 The Certificate of Airworthiness, Certificate of Registration and Airworthiness Review Certificate of the helicopter were valid on the date of accident. There was no reported snag pending rectification.

3.1.3 The helicopter was flying for carrying out relief operations as per the requirements of Uttrakhand Government/ UCADA and was assigned to the District Magistrate under whose jurisdiction the relief operation was being carried out. The helicopters flew as per the instructions and documentation was finally made by the pilot at the end of the day.

3.1.4 PIC was fully qualified and experienced to operate the flight. He had huge hill flying experience.

3.1.5 There was no formal SOP/ guidelines made by UCADA for conducting the relief/ rescue operations. As and when the requirement of a helicopter arose, UCADA approached the helicopter operator(s) for providing their helicopter for the said requirement.

3.1.6 Though required by the Operations Circular on the subject, there was no co-ordination between DGCA, local authorities and operator for smooth & safe conduct of the relief operations.

3.1.7 The temporary helipads used for rescue/ relief operations did not meet requirements of DGCA CAR on “Minimum Safety Requirements for temporary Helicopter Landing Areas”.

3.1.8 Temporary helipads at Aarakot & Moldi had only 'H' marking. The helipad at Moldi was just a square piece of level land (appx 15*15 feet) made by cutting the paddy crop and marking 'H' on it.

3.1.9 Before undertaking the operations, the operator/ pilot did not carry out a safety assessment of the area of operation through reconnaissance particularly helipad in village Moldi and adjoining valley. Moldi helipad was made in the morning of the day of accident.

3.1.10 As per the crew operating in the area at the same time, weather at the time of accident was fine with visibility of more than 5000 meters.

3.1.11 The cables spanning the valley were not marked for identification. The villagers keep on putting these cables on and off for transportation of apples.

3.1.12 Flying experience of the PIC in the hills made him complacent about the flight to Moldi & back. 'Flight safety' took a backseat and productivity coupled with 'the Mission accomplishment' became paramount.

3.1.13 There was a transformer pole in the forward direction (easterly) and houses in the surrounding area (easterly, southerly and westerly direction), therefore PIC decided to fly in the westerly direction after takeoff from Moldi.

3.1.14 On attaining safe height after liftoff backwards, the helicopter initiated left turn while continuing the climb in order to proceed in the westerly direction.

3.1.15 Just after completion of 180° turn, it impacted the trolley cable which was running in the North-South direction.

3.1.16 The trolley cable broke due entanglement with helicopter main rotor blades (near root). All main rotor blades suffered damages.

3.1.17 The helicopter was thrown away in the Northerly direction. It hit a hill top and caught fire while rolling down the hill.

3.1.18 The helicopter was destroyed due impact and fire. All three occupants onboard received fatal injuries.

3.2 Probable Cause of the Accident

The accident occurred because the helicopter during climb hit the cables running across the valley which was a result of disregard for operational safety by various stakeholders, viz

- The landing/ takeoff area (helipad) was not made as per the laid down requirements

- The trolley cables running across the valley were neither marked for aerial identification purposes nor was there any system of intimation of existence of these cables to the operator
- The operator had not carried out any risk analysis or risk mitigation before sending the helicopter for relief operations
- The pilot had not carried out reconnaissance of the area
- During approach to the helipad, PIC did not see the cables which made him think that the path was clear of cables.
- Before take-off, pilot had not carried out survey of the flight path he was going to fly.
- Complacency of individuals and non-demarcation of organizational responsibilities and accountabilities at operating level

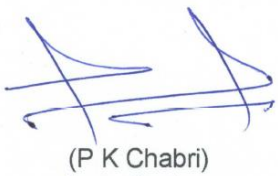
4 SAFETY RECOMMENDATIONS

4.1 DGCA should convert the Operations Circular No. 7 of 2013 into a Regulation so that it becomes binding on all stakeholders.

4.2 DGCA may amend the Hill Check Performa to incorporate carrying out both high & low level reconnaissance and lay down associated procedures.

4.3 DGCA may add a format in the CAR Section 4 Series B covering the information which the organization responsible for preparation & maintenance of helipad should provide to the helicopter operator prior to operation of flight to that helipad.

4.4 UCADA should play an active role in facilitating the NSOP holders by maintaining suitable temporary helipads across the State as elaborated in the SOP of SDMA and only such helipads be utilized by the operators during relief operations.



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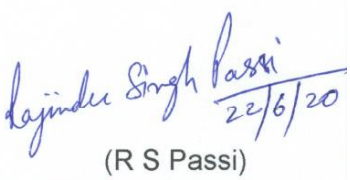
Investigator



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Investigator – In – Charge

Date: 22.06.2020
Place: New Delhi