

AIRCRAFT ACCIDENT INVESTIGATION REPORT

OF

FISHTAIL AIR PVT. LTD

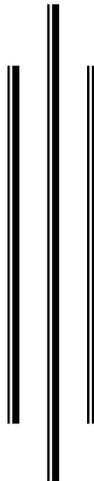
9N-AJI AS-350B3

AT

Listi 5; Panglang (Last Resort), Sindhupalchowk District

On

3rd August, 2014



AIRCRAFT ACCIDENT INVESTIGATION COMMITTEE

Ministry of Culture, Tourism and Civil Aviation

4th September, 2014

FOREWORD

This report on the accident of Fishtail Air Pvt Ltd. 9N-AJI, Chartered Flight on its intended return leg from Listi 5, Panglang (Last Resort) to Dhulikhel (Dhulikhel-Kodari-Last Resort-Dhulikhel) has been prepared based on the investigation carried out by the 'Aircraft Accident Investigation Committee' constituted by the Ministry of Culture, Tourism and Civil Aviation . In the context of the preparation of the report, the Committee scrutinized all the available resources including the aircraft's technical information, relevant documents, existing Rules and Regulations, site examination, meteorological reports and direct interviews with the following personnel:

- a) PIC of the flight
- b) Act. Operation Director, Fishtail Air
- c) Flight Dispatcher of said flight.
- d) Eye Witness of the Accident (3 person)

The Investigation Committee is mandated to determine the probable cause and actual fault. As such, the elemental goal of the Committee is to determine the facts, conditions and circumstances pertaining to the accident based upon which recommendations have been formulated so as to prevent the recurrence of such accident/incident thus, ultimately enabling to build safer skies for all forms of aviation.

Mr. Buddhi Sagar Lamichhane

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(Member-Secretary)**

This report is prepared in accordance with the provisions of Civil Aviation (Accident Investigation) Rules, 2024 B.S. (1967) for the purpose of preventing future aircraft accidents and incidents. It is not the function of the commission to assign blame or determine civil and criminal liability.

Abbreviations

AOCR	: Air Operator Certificate Requirements
AFIS	: Aerodrome Flight Information Service
AGL	: Above Ground Level
AMSL	: Above Mean Sea Level
AMT	: Approved Maintenance Technician
ATC	: Air Traffic Controller
ATPL	: Airline Transport Pilot License
ATS	: Air Traffic Services
CAAN	: Civil Aviation Authority, Nepal
CAVOK	: Ceiling and Visibility 'OK'
CG	: Center of Gravity
C of A	: Certificate of Airworthiness
CPL	: Commercial Pilot License
CVR	: Cockpit Voice Recorder
DOM	: Date of Manufacture
EET	: Estimated En route Time
FOR	: Flight Operation Requirements
FSSD	: Flight safety and Standards Department
FWD	: Forward
ICAO	: International Civil Aviation Organization
IP	: Instructor Pilot
Kg	: Kilogram
LH	: Left Hand
NCAR	: Nepalese Civil Airworthiness Requirements
NM	: Nautical Mile

NWS : Nose Wheel Steering
PIC : Pilot-in-Command
PF : Pilot Flying
PIC : Pilot in Command
PNF/PM : Pilot Not Flying/ Pilot Monitoring
PROP : Propeller
PSI : Pounds per Square Inch
QNH : Pressure Setting to Indicate Elevation above Mean Sea Level
RH : Right Hand
RWY : Runway
SIC : Second-in-Command
SOD : Staff on duty
STOL : Short-field Take-off And Landing
SOP : Standard Operating Procedures
UTC : Universal Coordinated Time
VFR : Visual Flight Rules
VNKT/KTM : Kathmandu Airport
WX : Weather

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On 4th August, 2014, the Ministry of Culture, Tourism and Civil Aviation in regards to its decision constituted a Committee for the Aircraft Accident Investigation of 9N-AJI AS350B3 Helicopter owned and operated by Fishtail Helicopter whose tail rotor strike a person after landing at Listi 5; Panglang (Last Resort) while the helicopter was chartered from Last Resort to Dhurikhel.

Synopsis

On 3rd August 2014, at 0838 UTC (1431), a AS-350 B3 Helicopter registered as 9N-AJI, owned and Operated by Fishtail Air, during its charter flight on its intended return leg from Listi 5, Panglang (Last Resort) to Dhulikhel (Dhulikhel-Kodari-Last Resort-Dhulikhel) was involved in an accident. There was 1 Crew Members on board. The weather at Last Resort helipad during the accident was fair with clear Sky and Sunshine.

The Last Resort Helipad is an unmanned, gravel Helipad. The ground handling at this helipad is done by the locals and Resort Staff with any formal training. On the accident day, after landing at Last Resort, the PIC brought helicopter to Idle position. The Manager of the resort approached PIC from front on left side where the person carrying the flag was stationed. After reaching the PIC at right side of the helicopter, the PIC suggested the Manager that his Intension is to shut down the engine to board the waiting passenger through the small window on the right side of helicopter. The manager left the helicopter from front and moved towards left of the helicopter towards tail rotor. While the PIC was carrying out Engine shutdown procedure, the PIC observed a Manager through small mirror fitted on the Skid of the helicopter moving towards tail rotor of the helicopter. The PIC immediately got down from the helicopter to stop the manager moving towards danger area of the helicopter but before the PIC could instruct approaching Manager anything regarding the pertaining danger around tail rotor, the manager moved under the tail boom of the helicopter, where he had impact with tail rotor blade resulting in fatal accident.

The probable cause of the accident as determined by this Aircraft Accident Investigation Committee was due to lack of procedure of the company in an unmanned Helipad and lack of situational awareness of the resort manager while moving into danger area of the helicopter.

The accident didn't caused any bodily injuries to crew member. However, fatality to a person (third party) was observed. Pursuant to CAAN decision as of 4th August, 2014 this Aircraft Accident Investigation Committee had been constituted to investigate the accident. The Committee commenced its investigation task formally on 4th August 2014.

The Investigation Committee has made **7 safety recommendations** to the concerned agencies for the further enhancement of safety and to prevent such accidents in future.

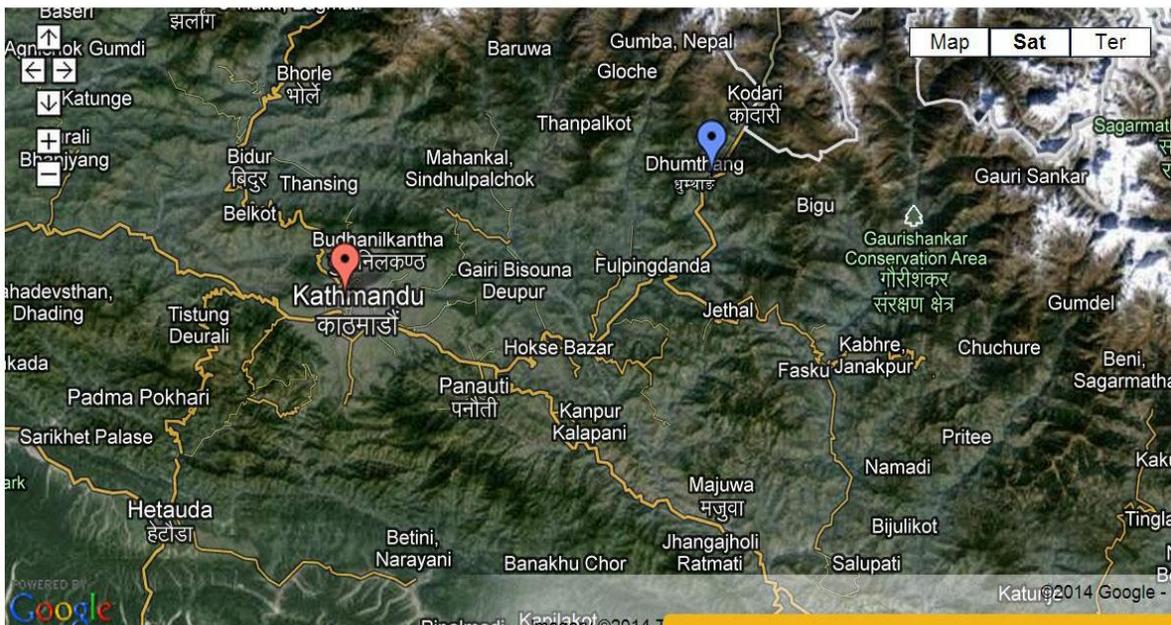
1. Factual Information

1.1 Flight History

On 3rd August, 2014, a AS350 B3 Helicopter registered as 9N-AJI owned and operated by Fishtail Air on its Charter flight was shuttling from Dhulikhel-Kodari- Last Resort-Dhulikhel at 0838 UTC (1431 LT) with 1 crew members. The flight from Dhulikhel- Kodari – Last Resort was accomplished in Normal manner with Visual Flight Rules (VFR).

The flight details as submitted by 9N-AJI to Kathmandu tower is as follows:

Helipad of Departure: Dhulikhel ; **EObT:** 1330 UTC ; **Destination Helipad:** Last Resort , **Altitude:** 4200 AMSL; **Total Estimated Elapse Time:** 0036 ; **1st Alternate Aerodrome:** VNKT; **2nd Alternate Aerodrome:** Panchkhaal; **Endurance:** 0130; **PIC:** Capt. Sujal Shrestha; **Equipments:** VHF/SAT Phone; **POB:** None; **Flight Rule:** VFR.



Accident Site

1.2 Injuries to Person

	Crew	Passengers	Others
Fatal	-	-	1
Serious	-	-	-
Minor/Uninjured	-	-	-
Total	-	-	1

1.3 Damage to Aircraft

The tail rotor section of the helicopter is damaged due to impact. Further following damage were observed in the helicopter during Site visit by this Committee.

1. Pieces of the trailing edge in one tail rotor blade missing/ flown away due to impact.
2. Impact on tail rotor Pitch Link Rods and Pitch Change Spider Assy.
3. Tail Gear Box (TGB) rear RH attachment screw displaced from its seating.
4. TGB rear attachment point bulging out from their positions on the Tail Boom.
5. TGB front attachment mount sheared.
6. Separation and Bulge in Aft Tail Rotor Drive shaft flexible couplings.
7. Metal particles in the TGB Chip Detector Plug.
8. Wrinkles and Cracks on lower Vertical Fin.
9. Bulge and Dent on Tail Boom under the TGB attachment area on LH & RH Side.
10. Deep cut mark on the long Tail Rotor Pitch Control Rod below the Rear Flexible Coupling.
11. Aft Long Tail Drive Shaft sheared near no. 5 Bearing Area.
12. All 5 Tail Drive Shaft Bearing shifted from their housings.
13. All 5 Tail Drive Shaft Bearing Mounts bent towards Front.
14. Front Steel short driveshaft damaged due to No. 5 bearing shifting out of its mount.
15. Separation and Bulge in forward Tail Rotor Drive Shaft Flexible Couplings.
16. TGB Slightly tilted downward on the RH Side and Also forward from its position.

1.4 Damage to third Party

A person working in Last Resort had an impact with Tail Rotor resulting into the Fatal Accident.

1.5 Personnel Information

1.5.1 Pilot in Command (PIC)

Sex and Date of Birth	Male ; 15 th January, 1991
Nationality	Nepalese
CAAN License No.	065 (H)
Validity of Licence	30 th October, 2014
Ratings	AS-350B/B2/B3 (Day VFR only)
Total flying hours	1281.17 Hrs.
Hours on Type	1131.7 Hrs.
Total hours flown as P1	16 Hrs.
Last 3 month	33.2 Hrs.
Last 30 days	31.1 Hrs.
Last 7 days	11.6 Hrs.
Last 24 Hrs.	3.4 Hrs.
Total flying hours same day	1.3 Hrs.
Crew Resource Management Training	14 March, 2014
Dangerous Goods Regulation Training Validity	November, 2015
Aviation Language Proficiency Level & Validity	Level 4 & July 2017
Recurrent Ground Refresher Training	March, 2015
Emergency Evacuation Training Validity	November, 2013
Route Check Validity	August, 2014
Pilot Proficiency and Upgrade check	March, 2013
Last Medical Date	November, 2013
Last Medical valid until	November, 2014

1.6 Aircraft Information

The AS350 B3 Helicopter, owned and operated by Fishtail Airlines is configured for single or two crews and 6 passengers with Red, White and red painting. It had an identification logo of a Fishtail Air on its fuselage and the nose section till half of fuselage is covered with Red painting, the rest of the fuselage is white in colour. The tail Section is covered with Blue colour on top and Red Colour at bottom. The Horizontal and Vertical Stabilized of the helicopter is painted red.

1.6.1 General

The Helicopter involved in the accident was a single engine helicopter AS350B3 manufactured by Eurocopter, France. This type of helicopter has proved its ability to perform well at high altitudes in Nepal as well as in many countries around the world.

The helicopter is owned and operated by Fishtail Air. The helicopter was built in the year 2009 and the aircraft had been in Fishtail Air operation since 7th March 2010.

1.6.2 Aircraft

Type (Model)	ECUREUIL AS 350 B3
Manufacturer	Eurocopter, France
Classification Aircraft category	Transport (passenger)
Registration	9N-AJI
Owner	Fishtail Air Pvt. Ltd.
Operator	Fishtail Air Pvt. Ltd.
Serial No.	4875
Date of Manufacture	2009
Type of flight	VFR
Initial Issue of Certificate of Registration (C of R)	7 th March, 2010
Validity of Certificate of Airworthiness (C of A)	06 August, 2015
Validity of RML	06 th August, 2015
Maximum Take-off Mass	2250 Kg
Maximum Landing Mass	2250 Kg
Total Time Since New of Airframe	4210 Hrs.

1.6.3 Engine

Make	Turbomeca, France
Model	Turbomeca Arriel 1B 2B1
Engine Serial No:	46331
Total Time Since New	4210 Hrs.
Total Gas Generator Cycle	7677 Cyc.
Total Free Turbine Cycle	2711 Cyc.
Total Time Since Overhaul	2445 Hrs.
Total Cycle Since Overhaul	3785 Cyc.
Engine Fitted On	Sept. 2009

1.6.4 Records of Recent Aircraft Incident

(I think here information on any accident /incident record caused by the pilot are relevant. It is not necessary the accident record of the particular helicopter equipment.)

There is no accident /incident record of the PIC after he was authorized to fly as PIC.

On 12 January, 2012 the helicopter had an incident at Thorang Phedi where the Tail rotor of the helicopter had hit the rock covered with snow. The tail rotor of the helicopter was completely damaged during this incident.

On 7 May, 2012 the helicopter had an incident at Tatopani where the HF cable was found broken and some part of the cable was enfolded around the tail rotor hub. There was cut of around 1 inch near one of the tail rotor blade. Horizontal stabilizer (secondary surface) on right side was found to be damaged of around 3 inch. The damage was through and through from lower to upper surface.

On 9 October, 2012 the helicopter made an emergency landing at Pawai Gauva due Low Level Fuel and Fuel Filter Light.

1.6.5 Aircraft Maintenance History

This Helicopter has been maintained as per approved maintenance programme approved by CAAN. All schedule inspections and maintenance tasks were found to have been carried out within the specified time limits. The last schedule 100 Hrs inspections were carried out on 30 July 2014. Last daily inspection of the helicopter was carried out by Licenced Engineer on 3rd August, 2014. The last power check of the helicopter was done on 30th July 2014 by licenced Pilot.

The aircraft didn't have any recurring defect reports. Airframe and Engine components status report reveals that all the components fitted on the helicopter were within their prescribed time limitations.

All applicable airworthiness directives and alert service bulletins were found to be complied with on the helicopter.

- Last Aircraft Weighing was carried out on 27th January 2010.
- Basic Empty Weight: 1286 Kg
- The Maintenance Release was issued on 21st July 2014 until 4278 hrs or 20 Oct, 2014.

1.6.7 Fuel and Lubricating Oil

The aircraft had 50% of Jet-A1 fuel supplied by Nepal Oil Corporation on board and MOBIL Jet Oil 254 lubricating oil was used on the aircraft as required/certified.

1.6.8 Flight and Navigation Instruments

The helicopter was equipped with the standard AS350B3 base line flight and navigation instruments required for VFR flight.

1.6.9 Last Resort Helipad Information

The Helipad located at Last Resort is a bare land with hard soil and gravel with patches of grass. The approx dimension of the helipad is 127ft. * 72 ft. . The helipad is located on a hill open on three sides and the sloping down from east to west.

The co-ordinates of the accident site Listi 5; Panglang (Last Resort), Sindhupalchok District are as given below:

N 27° 52' 39" Latitude

E 83° 53' 24" Longitude

Elevation: 4200 ft AMSL

1.7 Aids to Navigation

The helicopter was equipped with navigational aids including a GPS certified for Supplementary navigation. There is no Navigation facility at Last Resort Helipad.

1.8 Communications

The helicopter was equipped with a VHF transceiver and SAT phone. There is no communication facility at Last Resort Helipad.

1.9 Information on Flight Recorders

1.9.1 VEMD Data

This helicopter was equipped with a VEMD. It displays the parameters and functions such as engine health control and cycle recording. Information about any failures and over limits during the last moments of engine operation can be retrieved from the VEMD. The VEMD stores record of last 10 Power Check data.

1.10 Medical Information

The body of the victim was sent to TU Teaching Hospital Forensic Department for Postmortem. Postmortem of the victim's body recovered from the accident site was carried out. This committee didn't have access to the postmortem report as the report was under the custody of Nepal Police.

[I think here postmortem report is not necessary but the blood test report of pilot is necessary]

1.11 Organization and Management Information

1.11.1 Fishtail Air Pvt. Ltd.

The Fishtail Air Pvt. Ltd is a private organization established 2054 B.S. It is providing Charter helicopter Air Service with the helicopter fleet such as Bell 206 (1); AS350 B2 (1). The organization obtained its Air Operators Certificate AOC # 017/97 on 9th June, 1997 from the Civil Aviation Authority of Nepal for helicopter air transport operation.

2. ANALYSIS

2.1 General

The following factors such as technical defects, unlawful interference, explosives and pilot in capacitance/medical complications, Lack of training/qualification/experience which could have contributed to the accident have been reviewed separately and accordingly ruled out.

2.1.1 Technical Aspects of Helicopter

It was found that this aircraft had been maintained in accordance with the approved maintenance Program by CAAN. Based on the investigation process including document evaluation and personnel interview; aircraft maintenance documents, no evidence of any preexisting airworthiness discrepancies or pre-impact failures of structure, flight control, electrical system or engine were found.

There appears to be no apparent technical problems with the aircraft.

Airframe, Engine logbook, Weighing report, Component and Inspection status suggests maintenance of the aircraft has been done in accordance with the approved maintenance Program.

The Commission has discounted maintenance as a contributing factor to the accident.

2.1.2 Regulatory and Operational Aspect

During the course of investigation it was found that operational manuals, Flight Manual, SOP and Customized Maintenance Schedule etc. related with safe operation of aircraft were approved by CAAN. Thus, this committee has ruled out Regulatory Aspects as a contributing factor to the accident.

The pilot had landed the helicopter facing west of the helipad. The tail portion of the helicopter facing the small gravel road which is used by locals and last resort guest to come to helipad.

The P1 had a mere 16 hrs as a P1 while he had flown a total of 19.07 hrs after he acquired his ATPL. This meager amount of flight time after his P1 up gradation suffices well that he lacked total experience in positioning of helicopter from the approaching people and safety precaution that needs to be taken while landing at unmanned helipad.

- a. CAA Regulation on Operation of Helicopter at remote area Helipad

CAAN has not prepared any regulatory documents regarding the operation of helicopter in unmanned remote helipads. So in the absence of detail regulation it can be assumed that other issues like Airlines Duty and Responsibility, Pilots Duty and Responsibility, Single Pilot Operation and Dual Pilot Operation at remote and unmanned helipads etc are not under the framework of state regulation.

2.1.3 Airlines company rule and practice regarding the helicopter operation at remote areas
[what kind of document available with airlines on this issue –SOP or any other]

2.1.3 Experience, Pilot incapacitation and Medical

The flight crew was properly certified and qualified in accordance with applicable FORs and company requirements. The pilot has gathered total flying hours in this type of aircraft. He was very young, energetic and recently upgraded to Pilot p1 position carrying all the relevant tests. Thus, this committee has ruled out pilot experience as contributing factor to the accident.

As per the eye witness, the pilot had conversation with the victim before this accident happened. The pilot was in full control of the helicopter and was carrying out engine shut down procedure as mentioned by pilot during interview. In the same day the pilot had already accomplished landing appropriately. Thus, this committee has ruled out pilot incapacitation as contributing factor.

The blood sample test of the pilot was performed at National forensic laboratories for alcohol, sedatives and psychoactive drugs and the result was negative i.e the pilot was out of influence of any kind of alcoholic, sedative and psychoactive substance . Thus, this committee has rule out medical as contributing factor.

3. CONCLUSION

3.1 Findings

1. The Pilot was qualified and certified in accordance with the rules and the regulations CAAN.
2. The Pilot had adequate rest and his duty time was also within the acceptable guidelines prior to the flight.
3. The aircraft was operating within the performance limitation as per its Flight Manual. The weight and centre of gravity were within the prescribed limits prior to the take-off Dhulikhel.
4. The aircraft was maintained as per the requirements.
5. There was no evidence of failure of the aircraft's flight controls, systems, structure, or power-plant prior to the ground contact.
6. The helicopter was on the shutdown mode while the accident occur.
7. The Helicopter has been substantially damaged.
8. The pilot did not analyze that the positioning of helicopter might be a danger for the untrained and illiterate persons of remote areas.
9. The training and awareness to the pilots who are operating flights at remote areas is inadequate.
10. The weather condition at the accident site was fair at the time of the accident.
11. Pathological examination was carried out at
12. Please add some more findings in consultation with GN Lama and rajan sir.

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3.2 Cause

Probable contributing factors were

The probable cause of the accident as determined by this Aircraft Accident Investigation Committee was due to lack of procedure of the company in an unmanned Helipad and lack of situational awareness of the resort manager while moving into danger area of the helicopter.

3.3 Safety Recommendations

3.3.1 for CAAN

1. A check flight should be carried out for the pilot before he/she is cleared for first solo PIC flight under the supervision of CAAN observer.
2. FOR (H) article 2.8.3 PIC clearance should be amended.
3. CAAN should prepare a regulatory document related with the operation of helicopter at remote and unmanned areas or helipad.

3.3.2 for Fishtail Air and all operators

1. In single pilot operation, when rotor is turning, passenger embarking and disembarking procedure should be developed in company SOP.
2. The PIC should not use any person for the purpose of passenger handling or helicopter marshalling unless that person has been given comprehensive safety briefing by PIC or operator.
3. In marked helipad all concerned local people should be given safety briefing and helicopter safety briefing leaflets should be distributed for safety awareness.
4. After receiving positive signal from the PIC only trained and authorized person should be allowed to approach helicopter on the ground when rotor is turning. The person should take all necessary safety precautions while approaching helicopter in full view of PIC.
5. The PIC should be briefed properly by the operations regarding safety precautions he/she has to take while operating in remote areas.