Government of Nepal
Aircraft Accident Investigation Committee 2023

Final Report

Accident Investigation of 9N-AJZ, AS350B3e
Owned and Operated by Simrik Air Pvt. Ltd.
At Makalu Barun Area, Siprung, Sankhuwasabha on 5th May 2023

FOREWORD

This report on the accident of 9N-AJZ, AS350 B3e helicopter owned and operated by Simrik Air Pvt. Ltd is based on the investigation carried out by the Accident Investigation Committee constituted on May 12, 2023 as per the provisions of the Civil Aviation (Investigation of Accident) Regulation 2014 (2071 B.S.). The investigation was carried out according to the guidelines provided by the Procedure Manual of Aircraft Accident/Incident Investigation 2022, Nepal.

The sole objective of the investigation is to identify the cause of the accident and suggest recommendations to prevent the recurrence of such kinds of accident in the future. It is not the purpose of this investigation to apportion blame or determine civil or criminal liability.

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Joint Secretary, Buddhi Sagar Lamichhane
Chairman

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Dr. Er. Anil Bhujel Member	ATC officer, Mukesh Dangol Member	Er. Tanuja Pokharel Member-Secretary

Note:

1. This report contains the facts which have been determined up to the date of publication. This information is published to inform the aviation industry and the public of the general circumstances of the accident.

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SYNOPSIS

Operator	Simrik Air Pvt. Ltd
Aircraft Type and Model	AS350B3e
Registration	9N-AJZ
Type of Flight	Cargo charter, Sling operation
Location of Accident	Siprung area, Sankhuwasabha
Persons on Board	Flight Crew-1; S/N Crew-2; Passengers-2
Date of Accident	5th May 2023
All time in this report is in UTC	
Local Time: UTC+5:45	

On 5th May, 2023, Simrik Air's AS350 B3e helicopter, registration 9N-AJZ, met with an accident near Siprung, Sankhuwasabha during a routine chartered cargo sling operation related to "Upper Arun" hydropower construction project.

While the helicopter was on left skid contact partial hover[#] for S/N crew disembarkation followed by sling equipment unloads, pilot experienced a sudden imbalance causing a left tilt resulting in the rotor to strike the top end of a drilling machine located in the vicinity of the site.

Based on the available facts and its analysis, the committee has issued three recommendations for further improvement of flight safety.

[#] *Skid contact partial hover means the operation intended to embark or disembark crew members and their equipment on sloping or uneven terrain. Such operations are conducted by partially contacting one or both skids while keeping the aircraft horizontal.*

[*] *In this report, local helper refers to the passenger on-board the helicopter, allegedly claimed by the operator to be a ground support staff. He was identified as a local resident residing nearby the accident site.*

Contents

1. FACTUAL INFORMATION

1.1 History of Flight

The helicopter departed from Tribhuvan International Airport (TIA) for Gola, Sankhuwasabha a day prior to the accident on 4th May 2023 and arrived at 17:54 LT where it was declared a night stop. On 5th May, 2023, the helicopter was released at 06:15 LT after completion of *'before first flight check'*. The helicopter was airborne for the first mission of the day at 07:12 LT. The helicopter completed sixteen short missions within the area, accounting for a total of 3 hrs of flying time. The two remaining sling shuttles at the final location were within 1.5 NM from the load drop-off site. The helicopter headed for the proposed seventeenth flight of the day with five persons on board (Flight Crew-1; S/N Crew-2; Passengers-2).

This was the first of the two shuttles at the location. Upon reaching the location, the PIC scanned for a landing site nearby but couldn't locate an appropriate site for full touchdown landing. Thus, he decided on a single skid partial hovering to disembark the S/N crew and sling equipment for load preparation. The site had a North-South orientation with a big drilling machine resting towards the East. The PIC decided to approach the site heading south and executed a left skid contact partial hover.

After disembarking S/N crew and unloading the sling equipment, pilot experienced a sudden imbalance causing a left tilt resulting in the rotor to strike the top end of a drilling machine located in the vicinity of the site. The PIC increased his left cyclic inputs in an attempt to correct the sudden tilting of helicopter. A greater amount of left cyclic input caused the rotor to tilt further left. At this point, the CG imbalance and overcorrection caused the helicopter to lurch sideways towards east. As a result, the rotor struck the top portion of the drilling machine (Figure 1), subsequently causing the helicopter to lose control and slid downslope; approximately 8ft from intended point of left skid contact. At this point, the tail rotor hit the ground and broke off the shaft. The helicopter then toppled several times before coming to the rest.

Table 1: Partial hovering point specifications

Coordinates	27°40'42.92" N 87°22'12.79" E
Elevation	4700 ft
Surface	Hard dry surface (grass)

Figure 1: Drilling machine stationed towards the east of intended point of left skid contact

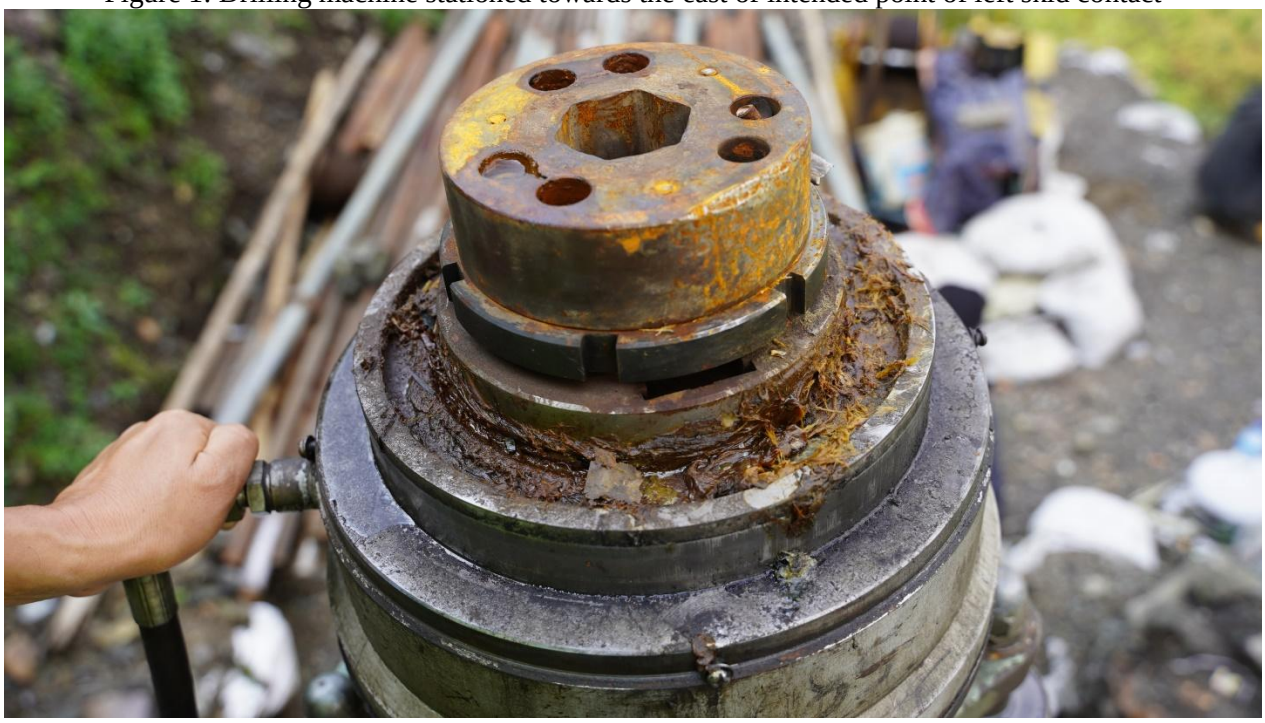

Figure 2: Impact point

1.2 Injuries to Persons

The local helper* lost his life on the spot whereas the passenger on-board was thrown out while the aircraft toppled and endured minor injuries. The PIC was seriously injured. The details of injuries to persons are given below (Table 2):

Table 2: Injuries to Persons

Injuries	Crew	Passengers	Total
Fatal	-	1 (Local Helper*)	1
Serious	1	-	1
Minor	-	1	1

1.3 Damage to Aircraft

The helicopter was substantially damaged. Aircraft parts were found scattered around the vicinity as shown in Figure 4.

1.4 Other Damages

No damage was caused to any private property or third party on ground. There was no noticeable environmental effect caused by the accident.

1.5 Personnel Information

The details of PIC are depicted below (Table 3):

Table 3: PIC Information

Pilot-in Command (PIC)	
Date of Birth	: 15th June 1981
Gender	: Male
Type of License and Number	: ATPL (H)
License Issuing Authority	: CAAN
License Validity	: 29 Feb 2028
Aircraft Rating	: AS350-B3e (valid), BK 117B2
Instructor Ratings	: AS350-B3e
Total hours flown	: 7843:20 hrs
Total hours on type	: 5286:26 hrs
Flight hours in last 12 months	: 759:41 hrs (May 2022 – April 2023)
Flight hours in last 3 months	: 191:14 hrs (February 2023 – April 2023)
Flight hours in last 30 days	: 61:40 hrs
Flight hours in last 7 days	: 05:27 hrs
Previous rest period	: 11:20 hrs
Medical Certificate Type	: Class I
Medical Validity	: August 2023
Aviation Language Proficiency	: Level 5 (Extended)

Language Proficiency validity	: 02 September 2026
Limitation/ Restriction	: None
Marital Status	: Married
Previous Accident/ Incident	: 22 June 2015, Samdo, Gorkha
Enforcement	: None
Emergency evacuation training	: June 2022
Simulator Training	: No
Dangerous Goods Regulation	: August 2021
Route Check	: February 2022
PPC with Instrument, IP/DCP	: With IP February 2023
Ground Refresher	: May 2022
Crew Resource Management	: July 2022

1.6 Aircraft Information

The details of aircraft are depicted below (Table 4):

Table 4: Helicopter Information

Operator	: Simrik Air Pvt. Ltd		
Owner	: Simrik Air Pvt. Ltd		
Model/Type	: AS350-B3e		
Type of flight	: Chartered		
A/C MSN	: 7324		
Year of manufacture	: 2012		
Registration	: 9N-AJZ		
Total Times since New	: 9005:27 hrs		
Issue of Certificate of Registration in Nepal	: 17 May 2012		
Validity Date of Certificate of Airworthiness	: 16 May 2024		
Validity Date of Radio Mobile License	: 16 May 2024		
Validity of Certificate of Release to Service	: Issued on 2 May 2023 (due on 9148:06 hrs)		
Engine			
Manufacturer	: Safran		
Model/Type	: Arriel 2D Safran		
Serial Number	: 50018		
Total Time since New [TTSN]	: 6720:51 hrs		
Total Cycle since New [TCSN]	: N_1 – 4751 N_2 – 1448		
Time since Overhaul [TSO]	S/N	TSO	Date
Module 1	19119	1721:14 hrs	23 February 2019

Module 2	25993	2455:32 hrs	11 June 2019
Module 3	33195	2680:29 hrs	11 June 2019
Module 4	29155	2162:29 hrs	19 September 2019
Module 5	27145	2162:29 hrs	08 October 2019
Cycle since Overhaul [CSO]	N1	N2	Date
Module 1	3039	1119	23 February 2019
Module 2	4751	1636	11 June 2019
Module 3	4751	1636	11 June 2019
Module 4	3872	1448	19 September 2019
Module 5	3872	1448	08 October 2019
Last Overhaul Done Date			
Module 1	23 February 2019		
Module 2	11 June 2019		
Module 3	11 June 2019		
Module 4	19 September 2019		
Module 5	08 October 2019		

1.7 Aircraft Maintenance History

The aircraft was maintained as per the approved maintenance requirements. All scheduled inspections and maintenance tasks were found to be carried out within the specified time limits. The last scheduled maintenance was 600hrs inspection completed on 2nd May 2023 and satisfactory test flight carried out. No due maintenance work were found. The pre-flight inspection was carried out on 06:10 LT on the day of the accident.

1.8 Meteorological Information

According to the PIC and witnesses, the local weather conditions at the landing area were fine with VFR normal. The wind was calm and no clouds were observed at the time of the accident. The last weather details received at 12:30 LT by the PIC were as follows:

Table 5: Weather Information at accident site

Meteorological parameters	**Condition**
Wind	Calm
Visibility	more than 10km
Clouds	Sky clear
Temperature	28˚C

1.9 Wreckage and Impact Information

Due to the topographical complexities after the accident, the accident site could not be accessed immediately. The committee reached the accident site on 9th May 2023 (Figure 4). Most of the perishable information like initial impact marks and traces could not be identified and confirmed

by that time. However, upon minute inspection of the accident site, it is evident that the rotor impacted the top of the drilling machine causing a loss of control in flight. After that, the helicopter skid down and hit the tail rotor 8ft down the slope. The tail portion detached causing the helicopter to topple downslope several times before it came to a final rest at co-ordinates 27˚ 40’ 43” N 87˚ 22’ 12” E (Figure 5).

Figure 3: South view of the intended point of left skid contact

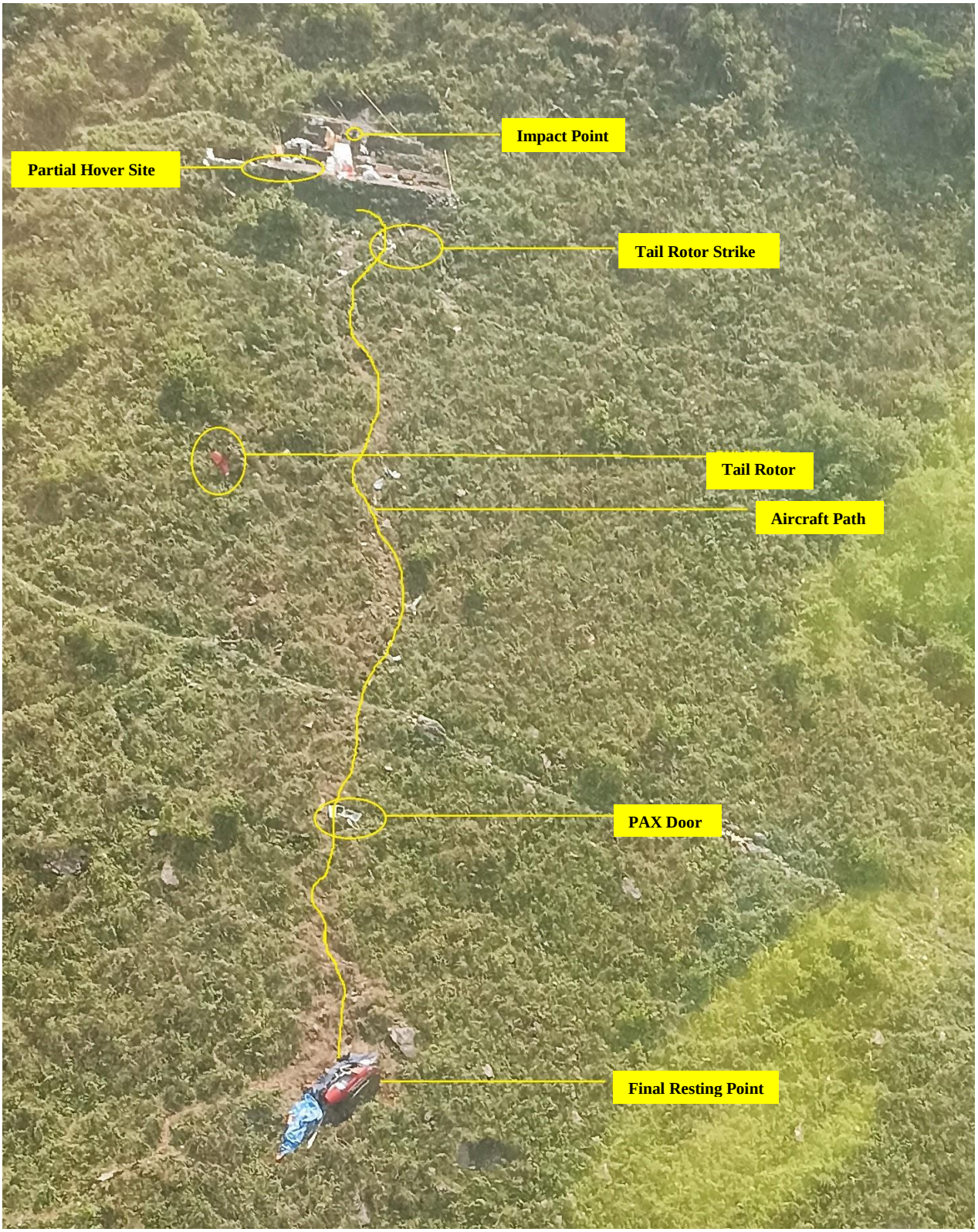

Figure 4: Aerial View of the wreckage distribution

Figure 5: Helicopter Wreckage

1.10 Flight Navigation and Communication Instruments

The helicopter was equipped with a VHF transceiver and SAT phone on board on serviceable condition. Two way communications was always maintained throughout flight operations between the aircraft and ground personnel. The aircraft was also equipped with V2 Tracker and VEMD.

1.11 Organizational and Management Information

Simrik Air, established in 2001, is a helicopter service provider company with passenger and cargo charter, sling and emergency medical operations' authorization.

Simrik Air has been operating Three AS 350B3e Airbus Helicopters H125, and one Bell 407GXP helicopter.

2. ANALYSIS

Any issues related to technical malfunction or weather were ruled out based on the factual information from on-site visit, analysis of documents, interviews with concerned individuals and witness information. Thus, the committee ruled out the need for VEMD analysis.

The aircraft was maintained as per the approved maintenance schedule and no reported technical issues were observed. Any shortcomings or problems related to regulatory oversight were also duly ruled out. Therefore, the committee prioritized the analysis to operational aspects. In the absence of recorded data, the pilot, survivor and eye witness's recollections were the primary source of information about the flight.

After 16 short missions within the vicinity of the accident sites, the helicopter intended to carry out the last two sling operations of the day from the site (Table 1). The PIC scanned the vicinity to identify a suitable site before deciding on left skid contact partial hovering due to lack of suitable landing site. The intention was to disembark two trained S/N staffs along with sling equipment for load preparation. After disembarkation the PIC experienced a sudden imbalance causing a left tilt resulting in the rotor to strike the top end of a drilling machine located in the vicinity of the site. The committee found that the local helper* was not acquainted with adequate knowledge about helicopter operations. Local helper* was neither trained nor briefed about partial hovering operation as stated by the PIC during interviews.

The committee doesn't have conclusive evidence to fully identify reasons leading to the abrupt shift in CG causing a sudden tilt of helicopter towards left. This resulted in the helicopter reacting in a way that the pilot couldn't rationalize in the short time available. The PIC increased his left cyclic inputs in attempts of correction. A greater amount of left cyclic input caused the rotor to tilt further left. At this point, the CG imbalance and overcorrection caused the helicopter to lurch eastwards to the left. The resulting occurrence was the rotor striking the top portion of the drilling machine.

Subsequently, the helicopter lost control and slid down the slope; approximately 8ft from intended point of left skid contact. At this point, the tail rotor hit the ground and broke off the shaft. The helicopter then toppled several times before coming to the rest.

Even though several helicopter operators have been conducting partial hovering operation in Nepal, neither any operators nor the regulator had developed SOPs for such operations at the time of the accident, and no trainings have been provided to the flight crews on partial hovering operations so far.

3. CONCLUSION

3.1 Findings

1. The PIC was qualified and certified as per the CAAN requirements.
2. The helicopter was airworthy and maintained as per manufacturers manual and CAAN requirements.
3. The weather was fair with VFR normal.
4. No published requirements for partial hovering operations were in place.
5. Two passengers (one local helper*) were onboard the helicopter during the intended sling operation.
6. Safety briefings were not delivered to the passenger (local helper*) by the PIC prior to taking onboard.
7. The passenger (local helper*) was not trained by the operator with regards to special helicopter operations yet allowed on-board.

3.2 Probable Cause

The most probable cause of the accident was an overcorrection input of the left cyclic control by the PIC in an attempt to counter the sudden shift in CG resulting in an impact with the drilling machine located at the vicinity while the helicopter was on a left skid contact partial hover.

3.3 Contributing factors

1. Lack of appropriate SOP and/or requirement for skid contact partial hover.

4. SAFETY RECCOMMENDATION

1. All helicopter operators should develop SOP for skid contact partial hover operations. Such SOP should be evaluated and duly approved by CAAN.
2. The PIC should ensure that only trained personnel are onboard during sling operations.
3. CAAN should study the requirements of pilot trainings, develop a training syllabus and guidelines for skid contact (partial hover) operations.

APPENDIX-1

Actions taken and in place after the accident

1. CAAN has made simulator training mandatory to all helicopter pilots effective from 1st January 2024.
2. Simrik Air has developed and applied for approval of SOP on partial hovering operations in Nepal. SOP Chapter 6, Issue 02, Amendment No.:001 dated October 2023