



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

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|--------------------------------|-------------------------------------------|-------------------------|-------------|
| Location: | Spanish Fork, Utah | Accident Number: | WPR23LA191 |
| Date & Time: | May 15, 2023, 11:00 Local | Registration: | N227WM |
| Aircraft: | ROBINSON HELICOPTER COMPANY R22 | Aircraft Damage: | Substantial |
| Defining Event: | Hard landing | Injuries: | 2 None |
| Flight Conducted Under: | Part 91: General aviation - Instructional | | |

Analysis

The flight instructor and student pilot performed a straight-in autorotation with a power recovery maneuver to simulate landing the helicopter with a complete power loss. As the instructor demonstrated the autorotation, during the glide, the instructor realized that he was going to overshoot the landing spot, and forced the helicopter out of trim, which enabled the helicopter to increase its decent rate. As the helicopter crossed 100 ft above ground level, the instructor trimmed the helicopter and noted that the helicopter's airspeed and rotor RPMs were about 50 knots and 95%, respectively. The instructor initiated a flare and the helicopter started to sink. He then rolled the engine throttle UP and raised the collective, but the helicopter landed hard. Subsequently, the main rotor struck the tailboom, which sustained substantial damage.

The flight instructor reported no mechanical failures or anomalies that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The instructor pilot's improper landing flare during a straight-in autorotation, which resulted in a hard landing.

Findings

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|-------------------------|-------------------------------------------|
| Aircraft | Landing flare - Not attained/maintained |
| Personnel issues | Aircraft control - Instructor/check pilot |

Factual Information

History of Flight

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|---------------------|------------------------------------|
| Autorotation | Hard landing (Defining event) |
| Autorotation | Collision with terr/obj (non-CFIT) |

Flight instructor Information

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|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------|
| Certificate: | Commercial; Flight instructor | Age: | 26, Male |
| Airplane Rating(s): | None | Seat Occupied: | Left |
| Other Aircraft Rating(s): | Helicopter | Restraint Used: | 3-point |
| Instrument Rating(s): | Helicopter | Second Pilot Present: | |
| Instructor Rating(s): | Helicopter; Instrument helicopter | Toxicology Performed: | |
| Medical Certification: | Class 1 With waivers/limitations | Last FAA Medical Exam: | May 5, 2023 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | April 20, 2023 |
| Flight Time: | 357.3 hours (Total, all aircraft), 270.7 hours (Total, this make and model), 312.2 hours (Pilot In Command, all aircraft), 167.6 hours (Last 90 days, all aircraft), 99.4 hours (Last 30 days, all aircraft), 7.2 hours (Last 24 hours, all aircraft) | | |

Student pilot Information

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|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------|
| Certificate: | Student | Age: | 26, Male |
| Airplane Rating(s): | None | Seat Occupied: | Right |
| Other Aircraft Rating(s): | None | Restraint Used: | 3-point |
| Instrument Rating(s): | None | Second Pilot Present: | |
| Instructor Rating(s): | None | Toxicology Performed: | |
| Medical Certification: | Class 1 With waivers/limitations | Last FAA Medical Exam: | |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | |
| Flight Time: | (Estimated) 62.6 hours (Total, all aircraft), 62.6 hours (Total, this make and model), 10 hours (Pilot In Command, all aircraft), 18.4 hours (Last 90 days, all aircraft), 5.8 hours (Last 30 days, all aircraft), 0.8 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|--------------------------------------|------------------------------|---------------------------------------|--------------------|
| Aircraft Make: | ROBINSON HELICOPTER COMPANY | Registration: | N227WM |
| Model/Series: | R22 | Aircraft Category: | Helicopter |
| Year of Manufacture: | 2007 | Amateur Built: | |
| Airworthiness Certificate: | Normal | Serial Number: | 4172 |
| Landing Gear Type: | Skid | Seats: | 2 |
| Date/Type of Last Inspection: | April 15, 2023 Annual | Certified Max Gross Wt.: | 1370 lbs |
| Time Since Last Inspection: | 16 Hrs | Engines: | 1 Reciprocating |
| Airframe Total Time: | 4416 Hrs at time of accident | Engine Manufacturer: | Lycoming |
| ELT: | Not installed | Engine Model/Series: | O-360-J2A |
| Registered Owner: | Utah Helicopter | Rated Power: | 145 Horsepower |
| Operator: | Utah Helicopter | Operating Certificate(s) Held: | Pilot school (141) |

Meteorological Information and Flight Plan

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|-----------------------------------------|----------------------------------|---------------------------------------------|------------------|
| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Day |
| Observation Facility, Elevation: | KPVU, 4497 ft msl | Distance from Accident Site: | 5 Nautical Miles |
| Observation Time: | 10:56 Local | Direction from Accident Site: | 330° |
| Lowest Cloud Condition: | Clear | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | / | Turbulence Type Forecast/Actual: | None / None |
| Wind Direction: | | Turbulence Severity Forecast/Actual: | N/A / |
| Altimeter Setting: | 30.35 inches Hg | Temperature/Dew Point: | 15°C / 7°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Spanish Fork, UT (KSPK) | Type of Flight Plan Filed: | None |
| Destination: | Spanish Fork, UT (KSPK) | Type of Clearance: | None |
| Departure Time: | 10:30 Local | Type of Airspace: | Class G |

Wreckage and Impact Information

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|----------------------------|--------|-----------------------------|--------------------------|
| Crew Injuries: | 2 None | Aircraft Damage: | Substantial |
| Passenger Injuries: | N/A | Aircraft Fire: | None |
| Ground Injuries: | | Aircraft Explosion: | None |
| Total Injuries: | 2 None | Latitude, Longitude: | 40.07911,-111.86675(est) |

Administrative Information

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|-----------------------------------|---------------------------------------------------------------------------------------------------------|
| Investigator In Charge (IIC): | Nepomuceno, Eleazar |
| Additional Participating Persons: | Suzanne Braund; FAA; Salt Lake City, UT |
| Original Publish Date: | April 4, 2024 |
| Last Revision Date: | |
| Investigation Class: | Class 4 |
| Note: | The NTSB did not travel to the scene of this accident. |
| Investigation Docket: | https://data.nts.gov/Docket?ProjectID=174533 |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).