



Federal Aviation Administration

Memorandum

Date: March 15, 2021

To: Tim Monville, Sr. Air Safety Investigator, National Transportation Safety Board

From: David Lewis, ASI, AFG-200-CE19, 615-324-1375

Subject: N660TN Helicopter Accident Fact and events

This memorandum is present the observations, facts and suspected sequence of events related to the accident involving an R-66 N660TN (accident# ERA21LA121) on 1/30/2021, 1430UTC. Aviation Safety Inspector (Ops) and IIC David Lewis and Aviation Safety Inspector (AW) Rocky Davidson conducted the on scene investigation.

FAA investigators arrived at the scene of the accident on 2/1/21, 1430L. It was noted that the accident aircraft was covered with large blue tarp that was removed by the owner's residential maintenance personnel. Investigators spoke with the pilot of the aircraft and received a verbal statement prior to viewing the aircraft. The pilot stated he had brought the helicopter to a 6' hover in preparation for takeoff but does not remember conducting a pedal turn. The aircraft rotated counterclockwise and pitched nose high with the right skid impacting the ground and the aircraft rolling to the right. The pilot cut the fuel and battery and evacuated through the left door.

The first debris observed was approximately 35 yards from the accident aircraft. This consisted of 3' section of main rotor blade that had detached following ground impact. Initial observation of the aircraft was it was laying on its right side at an approximate heading of 038 degrees. The tail boom had been bent upwards and was still attached to the fuselage. All tail rotor blades were still attached to the tail rotor assembly and tail rotor gear box but had suffered damage from suspected main rotor blade impact. The tail rotor gearbox showed nothing remarkable and had sufficient lubricant. Visual inspection of the tail rotor drive shaft entering the tail rotor gearbox show nothing remarkable. The full length of the tail rotor drive shaft could not be fully inspected due the position of the aircraft.

The main rotor system was bent rearward approximately 20 degrees. Both rotor blades showed remarkable damage from ground impact with one of the main rotor blades missing approximately 3' section from the tip of the blade. Outside of ground impact damage to the main rotor blades no other abnormalities were observed. The main rotor hub was intact with nothing remarkable to the hub, drive link assembly, P/C linkage, or rotating swash plate. Observable

transmission mounts suffered failure with all failure point showing no previous failure points or corrosion.

Minimal damage was observed to the fuselage area and canopies with no failures observed. Cockpit damage was limited to the headset interface which was broke from the impact of the head of the pilot.

Ground scaring showed where the initial impact of the right skid contacted the ground. This ground scaring showed the right skid penetrated the ground approximately 21" at a 10-15 degrees downward angle with an approximate heading of 355 degrees. Ground scaring was also found from the tail rotor guard impacting the ground to be parallel with the ground scaring caused by the right skid. Ground scaring from the main rotor blade impact with the ground to be consistent with the heading of the aircraft.

Based on the observation and facts above, the following sequence of events can be concluded.

The aircraft was brought to hover on an approximate heading of 124 degrees as shown by ground markings from where the aircraft was originally parked. The aircraft then turned to the left 129 degrees with minimal lateral drift shown by the ground scaring from the right skid. The nose of the aircraft moved upward approximately 10-15 degrees (as shown by ground scaring of the right skid) causing the rearward movement of aircraft. The right skid penetrated into the slightly rising terrain of the pilot's property approximately 21" and 10-15 degrees downward. This caused a pivot point for the aircraft to roll. Following the right skid impacting the ground the rearward movement coupled with the nose high attitude caused the tail boom to impact the rising terrain and bend upward. The aircraft began to roll to the right utilizing the right skid as a pivot point. The rolling motion caused the aircraft to exceed the critical angle at which point the aircraft could no longer be recovered. This rolling motion continued until the main rotor impacted that ground. When the main rotor impacted the ground a portion of the main rotor blade detached and was propelled approximately 35 yards on a heading of 304 degrees. The aircraft came to rest on it right side on a heading of 038 degrees.