Aviation Investigation Final Report

Location:	Pikeville, North Carolina	**Accident Number:**	ERA20LA220
Date & Time:	June 18, 2020, 17:00 Local	**Registration:**	N4QW
Aircraft:	Robinson R66	**Aircraft Damage:**	Substantial
Defining Event:	Collision with terr/obj (non-CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot was applying insecticide to a farm field and the accident flight was the first time the pilot had sprayed the field. Once he arrived at the site, 3 hours late, the pilot conducted two circular passes to survey the field, then landed, and the ground crew loaded the insecticide into the hopper. The pilot was not briefed of any hazards to operations prior to the flight by the ground crew or farmer. After takeoff, the pilot started applying the chemicals.

The helicopter was performing the spraying operation and was flying on a northerly heading when it impacted a non-energized wire. The wire was mounted about 30 feet up a 40 ft pole that also contained a hunting stand and stretched about 250 ft across the field from west to east where it connected to a tree bordering the field. The wire had been installed at least 20 years earlier and was installed high enough that a tractor or combine had clearance to move beneath it during harvest.

Clear daylight conditions existed at the time of the accident. The sun was at 39.85° above the horizon at an azimuth of 272.39° and was very close to being directly in line with the wire. It is possible that the sun's position relative to the wire would have made the 5/16-inch wire more difficult to see as the shadow of the wire and pole would have been nearly directly under the wire rather than offset.

The pilot, unfamiliar with the field, running late, and without the benefit of a detailed discussion with the landowner, relied solely on his brief visual surveillance of the field while operating the helicopter. Although the pilot likely observed the pole and hunting stand during his surveillance, it is likely that he did not see the wire due to its small diameter. Therefore, shortly after initiating the application of the insecticide, the pilot's failure to see and avoid the wire resulted in the helicopter impacting the wire and the pilot's subsequent loss of control and impact with terrain.

Probable Cause and Findings

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

The pilot's failure to see and avoid a small diameter wire during low altitude agricultural spraying operations. Contributing to the accident was the pilot's insufficient property survey.

Findings

Environmental issues	Wire - Awareness of condition
Personnel issues	Identification/recognition - Pilot

Factual Information

History of Flight

Maneuvering-low-alt flying	Collision with terr/obj (non-CFIT) (Defining event)

On June 18, 2020, at 1700 eastern daylight time, a Robinson R66 helicopter, N4QW, was substantially damaged when it was involved in an accident near Pikeville, North Carolina. The pilot was fatally injured. The helicopter was being operated as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight.

According to company personnel familiar with the operation, this was the first time the pilot had sprayed the farm field, and the pilot had not received any information about hazards in the area to be sprayed. The pilot arrived at the field about 3 hours later than planned. Prior to the application of the insecticide, the pilot performed two circular passes over the field to look for any hazards or obstructions; he then landed, and the ground crew loaded the insecticide into the hopper. Shortly after takeoff, the pilot began spraying operations. The helicopter was flying over the field during the spraying operation when an eyewitness heard a "popping" sound and saw the helicopter's sudden descent and impact with the terrain.

The helicopter impacted a non-energized wire, also known as a "dove wire" that was used for hunting. The wire was mounted about 30 feet up a 40 ft pole that also contained a hunting stand and was stretched across the width of the corn field (250 ft) from west to east (See figure 1). The wire was connected to a tree on the east side of field, perpendicular to the helicopter's flightpath. The wire had no markings and was 5/16 inch thick. According to the farmer, the wire was installed at least 20 years earlier and was installed high enough for a tractor or combine to get underneath it during harvest.

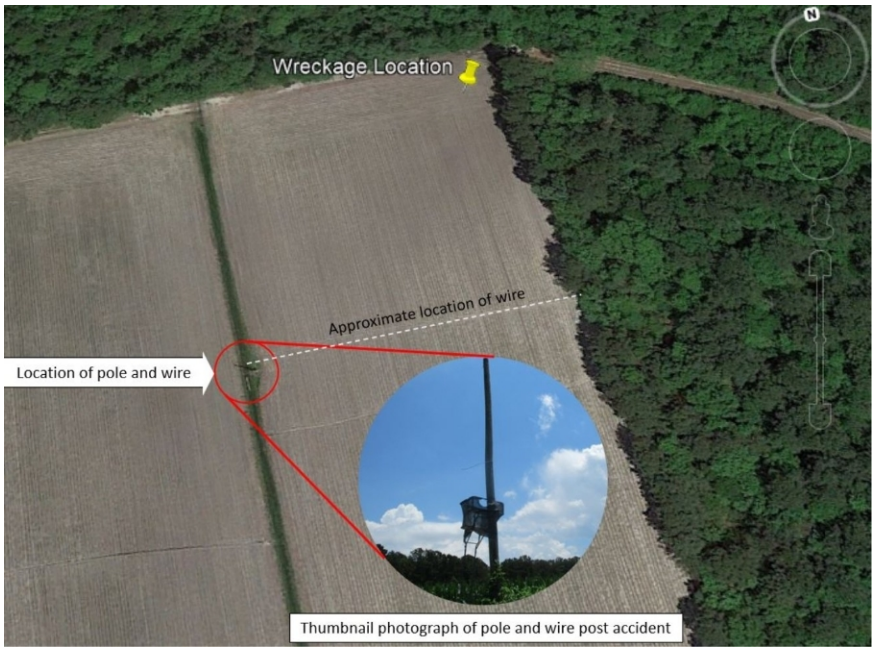

Figure 1 - Accident site overview of pole, wire, and wreckage location.

The wreckage path was oriented on a heading of about 030° magnetic, and the distance from the wire impact to the final wreckage location was about 275 ft. The tail rotor empennage separated about 2 ft aft of the rotating beacon light and was found in a nearby irrigation ditch. The tail rotor assembly and blades separated from the empennage. All major components of the helicopter were accounted for at the accident site. Both main rotor blades remained attached to the hub. About 20 ft of 5/16 inch diameter braided steel wire was wrapped around the blade pitch change horns, swashplate, pitch links, rotor hub, and both rotor blades.

In addition, there were tears and scuff mark damage to the blades that was consistent with contact with the wire. Cyclic and collective control continuity was confirmed. Tail rotor control continuity could not be confirmed due to impact damage. Examination of the wreckage revealed no mechanical discrepancies or anomalies that would have precluded normal operation.

According to the autopsy performed by the North Carolina Department of Health and Human Services, Office of the Chief Medical Examiner, the cause of death was multiple blunt force injuries, and the manner of death was accident.

Toxicology testing performed by the FAA's Forensic Sciences Laboratory identified trimethoprim (a prescription antibiotic) and tamsulosin (a prescription medication used to treat symptoms of an enlarged prostate) in the pilot's blood and urine. Neither of these are considered impairing.

According to the US Naval Observatory Astronomical Applications department, bright daylight conditions existed at the time of the accident. The sun was at 39.85° above the horizon (altitude) at an azimuth of 272.39°.

Pilot Information

Certificate:	Commercial	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	September 3, 2019
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	19340 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	**Registration:**	N4QW
Model/Series:	R66 No Series	**Aircraft Category:**	Helicopter
Year of Manufacture:	2013	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0402
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	June 5, 2020 Annual	**Certified Max Gross Wt.:**	2700 lbs
Time Since Last Inspection:	102 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	496 Hrs at time of accident	**Engine Manufacturer:**	Rolls Royce
ELT:	Installed	**Engine Model/Series:**	250-C300/A1
Registered Owner:	KRITTER CROPDUSTING INC	**Rated Power:**	300 Horsepower
Operator:	KRITTER CROPDUSTING INC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GWW,133 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	16:55 Local	**Direction from Accident Site:**	300°
Lowest Cloud Condition:	Scattered / 4800 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	27°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Pikeville, NC	**Type of Flight Plan Filed:**	None
Destination:	Pikeville, NC	**Type of Clearance:**	None
Departure Time:	16:45 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.444721,-77.925003

Preventing Similar Accidents

Preventing Obstacle Collisions in Agricultural Operations (SA-035)

The Problem

Accidents involving collisions with obstacles, including poles, wires, guy wires, meteorological evaluation towers (MET), or trees, are among the most common types of agricultural aircraft accidents. Some collisions involved obstacles that the pilots did not see (even during survey flights) but others involved obstacles that were known to the pilot and/or had characteristics that would make them visibly conspicuous.

What can you do?

- Maintain a quick-reference document (paper or electronic) at the operations base that contains field maps, charts, photographs, and details of all known obstacles.Frequently review current aeronautical charts for information about obstacles.
- Before you leave the ground, spend time becoming familiar with all available information about the target field and programming navigation equipment. Such preflight action can help reduce the potential for confusion or distraction in flight.
- Conduct aerial surveys of the target field but do not rely solely on an aerial survey to identify potential obstacles.
- Conduct regular ground surveys of fields. Some towers can be erected in hours, and obstacles can change since you last worked that field.
- When possible, use ground crews. They may be in a better position to see certain obstacles and help you ensure that your aircraft remains clear of them.
- Watch for shadows and irregularities in growth patterns to help identify obstacles.
- Speak with farmers and land owners to raise awareness about obstacle hazards.
- Use GPS and other technology to maintain awareness of obstacle locations.
- Be aware that workload, fatigue, sun glare, and distractions in the cockpit can adversely affect your ability to see, avoid, or remember obstacles.
- Understand the performance limitations and requirements for your aircraft, particularly when operating with heavier loads and at higher density altitudes.
- The National Agricultural Aviation Association's Professional Aerial Applicators' Support System reminds pilots that, when ferrying an aircraft or transitioning between sites, flying above 500 feet reduces obstacle collision risks: "Ferry Above Five and Stay Alive."

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-035.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Mccarter, Lawrence
Additional Participating Persons:	Corey Paczkowski; FAA FSDO ; Charlotte, NC George Kembro; FAA FSDO; Charlotte, NC
Original Publish Date:	September 7, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=101458