Aviation Investigation Final Report

Location:	Georgetown, Delaware	**Accident Number:**	ERA16LA253
Date & Time:	July 11, 2016, 18:50 Local	**Registration:**	N1SP
Aircraft:	Bell 429	**Aircraft Damage:**	None
Defining Event:	External load event (Rotorcraft)	**Injuries:**	1 Fatal, 3 None
Flight Conducted Under:	Public aircraft		

Analysis

The purpose of the flight was for an emergency response team to complete recurrent rescue hoist training from the helicopter. The three-person team included a rescue specialist, a system operator, and a safety officer. Each crewmember needed to complete 3 evolutions in each position to complete the recurrent training. During an evolution, the system operator would be positioned on the helicopter's skid while the rescue specialist would be lowered from, then picked up and brought back into, the helicopter as it hovered about 100 ft above ground level. After three evolutions, the pilot would land the helicopter; the crew would rotate positions and restart the process. According to a rescue checklist, the security of each member's safety harness was checked before each takeoff.

The accident flight was the seventh evolution of the day, and the first flight where the fatally-injured crewmember acted as the system operator. The safety officer and rescue specialist reported they checked and verified that the restraints were secure. The helicopter then lifted off the ground, moved to the practice area, and the system operator requested and was granted permission by the pilot to move to the helicopter skid. The system operator stepped onto the skid and fell from the helicopter. The pilot stated that throughout the accident sequence, the crew was not rushing while they completed the checklists.

Examination of the system operator's equipment did not reveal any failures or malfunctions that would explain the fall. Additionally, examination of the tether to the helicopter did not reveal any abnormalities. In the absence of any equipment failure, it is likely that the system operator was not fastened to the helicopter.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The emergency response team's failure to ensure that the system operator was secured to the helicopter, which resulted in his fall during the recurrent rescue hoist training operation.

Findings

Personnel issues	Incomplete action - Other
Personnel issues	Use of equip/system - Other
Aircraft	Agricultural/external load sys - Incorrect use/operation

Factual Information

History of Flight

Maneuvering-hover	Miscellaneous/other
Maneuvering-hover	External load event (Rotorcraft) (Defining event)

On July 11, 2016, about 1850 eastern daylight time, a hoist system operator was fatally injured after falling from a Bell 429 helicopter, N1SP, while performing external hoist operations at Delaware Coastal Airport (GED), Georgetown, Delaware. The commercial pilot and two other crewmembers were not injured, and the helicopter was not damaged. Day visual meteorological conditions prevailed, and no flight plan was filed for the local public flight, which was operated by the Delaware State Police.

The purpose of the flight was for an emergency response team to complete recurrent rescue hoist training. The three-person team included a rescue specialist, a system operator, and a safety officer. During an evolution, the rescue specialist would be lowered from the helicopter. The system operator, located on the helicopter's skid, would retract the hook back into the helicopter, and the pilot would then return the helicopter to the original hover position in flight. Then, the rescue specialist would cue the crew to return to the target area (where the rescue specialist was located). The system operator would extend the hook, the rescue specialist would connect himself to the hoist, and the system operator would raise the rescue specialist back into the helicopter. Each crewmember was required to perform 3 evolutions as a rescue specialist and a system operator to complete the training. After completing three evolutions, the pilot would land the helicopter; the crew would rotate positions and restart the process. The system operator wore a full body harness and was tethered to the interior of the helicopter through a strap with a carabiner that attached to a D-ring on the harness. The security of each member's safety harness was to be checked before each takeoff during the performance of the second rescue checklist.

According to each of the crewmembers, the accident flight was the seventh evolution of the day, and the first flight where the fatally-injured crewmember acted as the system operator. After the restraints were checked and verified secure, the helicopter lifted off the ground and flew to the practice area on the airfield. As the helicopter hovered about 100 ft above ground level, the system operator requested and was granted permission by the pilot to move to the helicopter skid. The system operator stepped onto the skid and subsequently fell from the helicopter. The pilot stated that throughout the accident sequence, the crew was not rushing while they completed the checklists.

The pilot landed the helicopter immediately and the rescue specialist and safety officer initiated patient care on the system operator.

Pilot Information

Certificate:	Commercial	**Age:**	36,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Unknown
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2	**Last FAA Medical Exam:**	August 1, 2015
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 14, 2016
Flight Time:	766 hours (Total, all aircraft), 200 hours (Total, this make and model), 164 hours (Last 90 days, all aircraft)		

According to Federal Aviation Administration (FAA) records, the pilot held a commercial pilot certificate with ratings for airplane single-engine land, rotorcraft helicopter, and instrument helicopter. His most recent second-class medical certificate was issued in August 2015. He reported 766 total hours of flight experience, of which 200 hours were in the accident helicopter make and model. His most recent flight review was dated March 14, 2016, and his most recent Hoist Class D External Load Designation Certification was completed on June 15, 2016.

The rescue specialist, safety officer, and system operator were all qualified both as system operators and rescue specialists. All three individuals had most recently completed hoist operation training on June 15, 2016.

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N1SP
Model/Series:	429	**Aircraft Category:**	Helicopter
Year of Manufacture:	2013	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	57184
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Turbo shaft
Airframe Total Time:		**Engine Manufacturer:**	Pratt & Whitney Canada Ltd.
ELT:	Not installed	**Engine Model/Series:**	PW207D1
Registered Owner:	STATE OF DELAWARE	**Rated Power:**	610 Horsepower
Operator:	STATE OF DELAWARE	**Operating Certificate(s) Held:**	None

According to FAA records, the helicopter was issued an airworthiness certificate on January 14, 2014,

and registered to the government in November 2014. It was equipped with two Pratt and Whitney Canada PW207D1, 610 shaft horsepower engines.

The system operator wore an Aerial Machine and Tool Corp. H1037-BL/M full body harness rated to 2,900 pounds. It incorporated 4 tether points; 2 on the front of the harness and 2 on the back. Each tether point incorporated a D-ring that could attach to a carabiner connected to the interior of the helicopter.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GED,51 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	18:54 Local	**Direction from Accident Site:**	5°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	28°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Georgetown, DE (GED)	**Type of Flight Plan Filed:**	None
Destination:	Georgetown, DE (GED)	**Type of Clearance:**	Unknown
Departure Time:	18:45 Local	**Type of Airspace:**	

The 1854 recorded weather observation at GED included wind from 060° at 6 knots, visibility 10 miles, clear skies below 12,000 ft above ground level, temperature 28°C, dew point 16°C, and an altimeter setting of 30.07 inches of mercury.

Airport Information

Airport:	DELAWARE COASTAL GED	**Runway Surface Type:**	Grass/turf
Airport Elevation:	53 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 3 None	**Aircraft Damage:**	None
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 3 None	**Latitude, Longitude:**	38.6875,-75.359169(est)

Medical and Pathological Information

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of the fatally injured crewmember. Fluid and tissue specimens tested negative for ethanol and other drugs.

Tests and Research

Examination of the system operator's full body harness by an FAA inspector revealed no evidence of failure or suspicious marks. No webbing, hardware, or stitching damage was noted on the harness. In addition, an examination of the restraint system secured to the interior of the helicopter revealed no anomalies, and all hooks and carabiners operated without anomaly.

Additional Information

The following items were listed in the Essential Hoist Operations Checklists used by the crew and were relevant to how the crew was tethered to the helicopter.

Safety Checklist #1
"8. Restraints SECURED"

Rescue Checklist #2
"5. SO & Safety are TETHERED, ANCHORED & DOUBLE CHECKED.
6. RS 1 & 2 on restraint."

After the accident, the operator modified the Rescue Checklist # 2, to include an additional check that the Safety Officer and System Operator are tethered and anchored to the helicopter.

Administrative Information

Investigator In Charge (IIC):	Kemner, Heidi
Additional Participating Persons:	Paul Basilotto; FAA/FSDO; Philadelphia, PA
Original Publish Date:	February 12, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=93594