Aviation Investigation Final Report

Location:	New Holland, Pennsylvania	**Accident Number:**	ERA15LA319
Date & Time:	August 15, 2015, 20:00 Local	**Registration:**	N40104
Aircraft:	Head AX9 118	**Aircraft Damage:**	Minor
Defining Event:	Loss of control on ground	**Injuries:**	2 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The commercial pilot reported that he chose to land the balloon about 45 minutes into the planned 1-hour flight because sunset was approaching. The pilot chose an approximate 150-ft wide, 500 ft-long field for the landing. The pilot advised the ground crew, who were in radio and visual contact, of the intended landing zone, and he was aware of the power lines opposite the approach end of the field. During the final approach to the field, the basket grazed several rows of corn. It then struck the ground and bounced along it for about 50 ft before the ground crew was able to grab the basket and stop it.

The pilot then began the shutdown procedures, and the ground crew informed him that the envelope was deflating prematurely. The pilot then noted that the vent line, which was normally secured to the basket, had loosened from its anchoring point and gotten caught between the ground and the basket during the landing sequence, allowing the envelope to deflate. He pulled the vent line free, but the envelope continued to collapse as the wind blew it toward the power lines; the basket remained stationary with the passengers still inside. The top third of the envelope draped over the power lines, which resulted in electrocution-related injuries to the passengers and pilot.

Probable Cause and Findings

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

The pilot's failure to adequately secure the vent line, which resulted in the premature deflation of the balloon's envelope and its subsequent contact with power lines. Contributing to the accident were the pilot's choice of an unsuitable landing area, which had power lines opposite the approach end, and his subsequent failure to maintain adequate clearance from the lines during the landing.

Findings

Personnel issues	Use of equip/system - Pilot
Personnel issues	Monitoring environment - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Wire - Decision related to condition
Personnel issues	Flight planning/navigation - Pilot

Factual Information

History of Flight

Standing	Flight control sys malf/fail
Standing	Loss of control on ground (Defining event)

HISTORY OF FLIGHT

On August 15, 2015, at 2000 eastern daylight time, a Head AX9-118 hot air balloon, N40104 incurred minor damage when it collided with powerlines after landing in a field, near New Holland, Pennsylvania. The commercial pilot sustained minor injuries, and the two passengers were seriously injured. The local sightseeing flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight that originated at the operator's base in Intercourse, Pennsylvania about 1855.

Approximately 45 minutes into the sightseeing, the pilot asked the two passengers if they would mind landing about ten minutes early, as the sun was beginning to set. He proceeded to scan the area for a suitable landing spot and selected a hay field as the most appropriate place. He stated he did not see any other landing spots and he had approximately 50% fuel remaining. The pilot then informed the ground crew via radio of the location, and they acknowledged and proceeded to the location. During final approach, he stated "everything looked good for landing." The basket grazed the last few rows of corn before touching down in an open field where it bounced and continued north-northeast for approximately 50 feet.

As the basket was secured by the ground crew, the pilot started the shutdown procedures and was told that the envelope was deflating. The pilot noticed the vent line had detached from the basket and was pinched between the ground and the basket as it drug along the ground. He tugged on it and pulled it free. As the envelope lost air, it began to elongate and blow downwind where it draped over the powerlines paralleling the field. The result was an electrical arc that went from the powerlines through the balloon cables to the basket, and electrocuted the pilot and passengers.

According to the passenger, he and his fiancé arrived at the balloon launch location at approximately 1800 and waited for about 45 minutes before they took off. The takeoff and flight were uneventful. They stayed relatively low, never getting above 1,000 feet and the pilot took them down lower a few times so he could check the ground wind speed, but nothing seemed out of the ordinary. The pilot asked the passengers if they could land 10 minutes early; assuming because it was starting the get dark. He also heard the pilot radio the ground crew and directed them to a specific location; to which the ground crew acknowledged.

As they were descending, the passenger stated he saw the field where they were going to land and it looked a little narrow and had powerlines on the far side, but the pilot did not seem concerned. As they landed they bounced and the basket tipped slightly forward, but neither he nor his fiancé remember anything after landing.

Eyewitnesses parked on the adjacent road south of the field, reported that the accident balloon approached the intended landing area from the south-southwest. As the balloon approached the landing site, it grazed the last few rows of corn before bouncing along the ground several times before the people on the ground chased the basket and grabbed onto it; As the basket was secured, with the passengers still inside, the balloon draped over the powerlines and started to smoke.

PERSONNEL INFORMATION

The pilot, age 52, held a commercial pilot certificate, with a rating for lighter-than-air free balloon. He did not hold, nor was he required to maintain, a Federal Aviation Administration (FAA) medical certificate. The pilot reported 519 hours of total flight experience in lighter than air aircraft and 31of those hours were in the same make and model as the accident balloon.

AIRCRAFT INFORMATION

According to FAA records and the balloon manufacturer, the balloon was manufactured in 1999, and was equipped with four propane tanks, a wicker basket, and an 119,544 cubic-foot envelope. The inflated envelope with basket was approximately 79 feet tall, and the inflated diameter was 62 feet. The most recent annual inspection was performed on June 24, 2015, and at that time the balloon had accumulated 81.5 hours of total time in service.

METEOROLOGICAL INFORMATION

At the time of departure and during the approximate 50-minute flight, weather observations from Lancaster Airport (LNS), Lancaster, Pennsylvania, located approximately 9 miles to the west of the accident site, recorded wind from 190 degrees at 6 knots, 10 miles visibility and clear skies, temperature 29 ° C with a dew point 17 °C. The barometric altimeter setting was 30.09 inches of mercury.

During a telephone interview, when asked about the wind conditions, the pilot stated that the wind was 6 to 8 knots at the takeoff location. However, when they got to the launch site, the wind speed appeared to be "a little higher" than that, so they waited about 45 minutes for the winds to decrease before departing.

WRECKAGE AND IMPACT INFORMATION

According to an FAA inspector who travelled to the accident site, the envelope, lines, basket and all major components were accounted for at the scene. The envelope was oriented on a northeast heading where it impacted the electrical power lines that were about 30 feet above ground level (agl) on the north side of the field. The field was a symmetrical rectangle, approximately 500 feet long on the west-east side and 150 feet wide on the border of a road running roughly north/south. The eastern portion of the field was bordered by farm buildings and a residential structure. The south portion of the field was bordered by mature corn.

The envelope remained undamaged and the stitching was intact. Several cables coming from the envelope to the basket and the skirt exhibited damage consistent with electrical arcing. The basket, instrumentation and components were not damaged.

Examination of the power lines revealed that they were not damaged during the accident.

ADDITIONAL INFORMATION

Witness Photographs and Video

Several photos and a video were submitted by witnesses who were parked in a car on an adjacent road, approximately 600 feet south of the accident location. The witness photographed the balloon coming from the south southwest at about 200 feet agl through touchdown and subsequent powerline contact. Review of the sequential photographs and video showed the balloon descending onto the last few rows of corn, bouncing on the ground, before ground personnel secured the basket. Once the basket was secured, the envelope continued to collapse and drift into the powerlines. As the balloon draped over the powerlines, smoke began emanating from the area around the basket.

FAA-H-8083-11A Balloon Flying Handbook

Chapter 8, "Landing and Recovery," stated, "Having the skill to predict the balloon's track during the landing approach, touching down on the intended landing target and stopping the balloon basket in the preferred place can be very satisfying. It requires a sharp eye trained to spot the indicators of wind direction on the ground. Dropping bits of tissue, observing other balloons, smoke, steam, dust, and tree movement are all ways to predict the balloon track on its way to the landing site. During the approach, one of the pilot's most important observations is watching for power lines."

The chapter further stated "When selecting a landing site, three considerations in order of importance are: safety of passengers, as well as persons and property on the ground; landowner relations; and ease of recovery."

Some questions the pilot should ask when evaluating a landing site were:
"• Is it a safe place for my passengers and the balloon?
• Would my landing create a hazard for any person or property on the ground?
• Will my presence create any problems (noise, startling animals, etc.) for the landowner?"

Pilot Information

Certificate:	Commercial	**Age:**	52,Male
Airplane Rating(s):	None	**Seat Occupied:**	None
Other Aircraft Rating(s):	Balloon	**Restraint Used:**	None
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 22, 2015
Flight Time:	519 hours (Total, all aircraft), 31 hours (Total, this make and model), 519 hours (Pilot In Command, all aircraft), 18 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Head	**Registration:**	N40104
Model/Series:	AX9 118	**Aircraft Category:**	Balloon
Year of Manufacture:	2014	**Amateur Built:**	
Airworthiness Certificate:	Balloon	**Serial Number:**	439
Landing Gear Type:	None	**Seats:**	
Date/Type of Last Inspection:	June 24, 2015 Annual	**Certified Max Gross Wt.:**	1650 lbs
Time Since Last Inspection:	82 Hrs	**Engines:**	
Airframe Total Time:	at time of accident	**Engine Manufacturer:**	
ELT:		**Engine Model/Series:**	
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	KLNS,402 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:		**Direction from Accident Site:**	70°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Broken / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	27°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Intercourse, PA	**Type of Flight Plan Filed:**	None
Destination:	New Holland, PA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Minor
Passenger Injuries:	2 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 1 Minor	**Latitude, Longitude:**	40.125556,-76.105834

Administrative Information

Investigator In Charge (IIC):	Mccarter, Lawrence
Additional Participating Persons:	Jim Pool; FAA- Flight Standards District Office; Harrisburg, PA
Original Publish Date:	March 2, 2016
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=91807