

		NTSB ID: ERA14FA231		Aircraft Registration Number: N3016Z	
		Occurrence Date: 05/09/2014		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Ruther Glen		State VA	Zip Code 22546	Local Time 1940	Time Zone EDT
Airport Proximity:		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer EAGLE		Model/Series C-7		Type of Aircraft Balloon	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>*** Note: NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report. ***</p> <p>HISTORY OF FLIGHT</p> <p>On May 9, 2014, about 1940 eastern daylight time, an Eagle C-7 Balloon, N3016Z, was destroyed by fire after a landing attempt to a field and subsequent impact with powerlines near Ruther Glen, Virginia. The commercial pilot and two passengers were fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local sightseeing flight that departed from Meadow Event Park, Doswell, Virginia, approximately 4 miles to the south of the accident location. The local sightseeing flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.</p> <p>Multiple eyewitnesses reported that the accident balloon approached the intended landing area from the south where another balloon had just landed. As the accident balloon approached the landing site, the pilot engaged the burner; however, the balloon struck powerlines, which resulted in a spark. A video obtained from a witness indicated that as the pilot approached the intended landing area, he engaged the burner for about 15 seconds prior to impacting the powerlines. Subsequently, the balloon basket and a section of the envelope caught fire. The balloon then began an accelerated climb and drifted out of the top view of the video recording.</p> <p>PERSONNEL INFORMATION</p> <p>The pilot, age 65, held a commercial pilot certificate, with a rating for lighter-than-air free balloon, which included a limitation for hot air balloon with airborne heater. He did not hold, nor was he required to maintain, a Federal Aviation Administration (FAA) medical certificate. According to a souvenir card, being handed out at the balloon festival, the pilot had 31 years of experience and over 660 hours of flight time.</p> <p>BALLOON INFORMATION</p> <p>According to FAA and balloon maintenance records, it was equipped with two aluminum propane tanks, a wicker basket, and a 78,133 cubic foot envelope. In addition, it contained a small pod of instruments that consisted of a vertical speed indicator, altimeter, and envelope temperature gauge. The most recent annual inspection, on the balloon, was performed on August 5, 2013, and at that time it had accumulated 270.4 hours of total time in service.</p> <p>The balloon was comprised of a basket, which was composed of wood, padding, woven wicker, rope handles for passengers to hold onto, and a fuel cylinder compartment which contained the two fuel cylinders. Attached to the top center of the basket were the single burner valve/can, coils, pilot light regulator, and pilot light valve.</p>					
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## Narrative (Continued)

Fuel lines ran from each of the two fuel cylinder tanks, up opposite sides of the basket, and attached to the burner can assembly. The balloon envelope was comprised of nomex and nylon panels. The envelope throat was to be attached to the top of the basket with cables.

## METEOROLOGICAL INFORMATION

The 1854 recorded weather observations from Hanover County Municipal Airport (OFP), Ashland, Virginia, located approximately 12 miles to the south of the wire strike site, included wind from 180 degrees at 10 knots, visibility 10 miles, few clouds at 12,000 feet above ground level (agl), temperature 28 degrees C, dew point 14 degrees C, and an altimeter setting of 29.99 inches of mercury.

An FAA inspector that was at the launch site prior to the flight departing stated that a mandatory safety briefing by the event organizer reviewed the weather conditions with the pilot participants of the balloon festival including the accident pilot. In addition, he stated that "wind conditions were measured on site several times prior to launch to establish a trend. I recall winds were slowly decreasing, from initially about 12 knots to some as low as 6 knots at the surface. The winds aloft indicated that winds by 1000 feet were increasing in velocity and shifting the course to the right."

## WRECKAGE AND IMPACT INFORMATION

The debris path was approximately 5 miles in length and was oriented on a northeast heading from the attempted landing field. The balloon impacted electrical powerlines that were about 30 feet agl near the attempted landing field. Several pieces of charred material were present in the vicinity of the powerline. Two aluminum propane fuel tanks, a hand-held fire extinguisher, the instrument pod, and various pieces of the charred envelope fabric, that were associated with the lower portion of the balloon envelope, were recovered along the debris path. Both propane fuel tanks were intact but exhibited thermal and impact damage and were devoid of fuel.

The balloon crown, crown ring, deflation port, and the burner were recovered on May 27, 2014, approximately 9 miles northeast of the takeoff location and about 5.9 miles north of the powerline strike location. An examination of the recovered components was performed on August 25, 2014, at a salvage facility located in Clayton, Delaware.

The balloon crown, crown ring, deflation port, basket bottom, and burner remained attached through several cables. The balloon envelope was torn in several sections. Several vertical and horizontal load tapes were torn. The skirt and throat of the balloon were torn and exhibited thermal damage. The crown line remained attached to the top of the envelope and the crown ring was found with all retained cords attached. Cord continuity of the crown, vent, and deflation line was established from the top of the envelope to the balloon basket. The bottom section of the deflation line exhibited thermal damage. The wood section of the basket was burned away, but the bottom section of the basket remained attached to the heating system of the balloon through stainless steel wires.

The single burner remained attached to the basket frame. The valve block assembly, burner can, coil assembly, liquid fire jet assembly, and igniter assembly all exhibited thermal discoloration. The fuel lines remained attached to the burner assembly but exhibited thermal damage. When the burner assembly handle was operated, it did not exhibit any anomalies. In addition, the burner assembly was able to move freely among the assembly frame as designed.

Further examination of the two recovered propane cylinder tanks revealed that the main valve on the center aluminum cylinder was damaged by fire and its position was not able to be determined. In addition, the fuel quantity gauge on each tank exhibited thermal damage and could not be read.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Richmond, Virginia, conducted an autopsy on the pilot on May 12, 2014. The autopsy listed "blunt force trauma" as the cause of death.

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## Narrative (Continued)

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated no ethanol was detected. However, both Fexofenidine and Valsartan were detected in the blood and liver.

According to the FAA Aerospace Medical Research, Forensic Toxicology Drug website, Fexofenadine, marketed under the trade name Allegra, was known as a nonsedating antihistamine used in the treatment of hay fever symptoms and the common cold.

According to the FAA Aerospace Medical Research, Forensic Toxicology Drug website, Valsartan, marketed under the trade name Diovan, was an angiotensin II receptor antagonist, commonly referred to as an Angiotensin Receptor Blocker or "ARB." It was typically used for the treatment of high blood pressure, congestive heart failure, and post-myocardial infarction.

## TESTS AND RESEARCH

## Handheld Global Positioning System

A Garmin 12 handheld global positioning system (GPS) was sent to the National Transportation Safety Board (NTSB) recorders laboratory for download in Washington, DC. The Garmin 12 handheld GPS system did not contain any pertinent information to the accident investigation.

A Garmin Rhino 530HCX handheld GPS was recovered and sent to the NTSB recorders laboratory for download in Washington, DC. The Garmin 530HCS GPS did not contain any pertinent information to the accident investigation.

## Cellular Phones

Three cellular phones were sent to the NTSB recorders laboratory for download. The cellular phones held photographs prior to the accident, but did not contain any photographic documentation of the accident itself.

## ADDITIONAL INFORMATION

## Witness Photographs

Several photos were submitted by witnesses. In particular, a witness located in another balloon that landed at the intended landing zone of the accident balloon, photographed another balloon landing at the intended landing zone site. In the photograph, the other balloon is shown on the ground in the field and unmarked powerlines are noted above a road just prior to the intended landing field. In addition, the photograph showed that the field that was the intended landing zone site had several trees just prior to it and located in front of the powerlines.

## Powerline Information

According to the power company, after the accident, they dispatched a team of employees to examine the powerlines. Upon examination, they noted that there was no structural damage to the lines. One phase line had a burn mark on the side that was closest to the intended landing zone. According to the power company, the powerlines were three-phase lines that were 7,200 volts phase to ground.

## Balloon Flight Manual

In the "Normal Flight Operations" section of the balloon flight manual, there was a note that stated, "Extreme care and judgment should be used in selection of landing sites in avoiding downwind powerlines."

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## Narrative (Continued)

In the "Performance" section of the balloon flight manual, it stated "during certification, the maximum demonstrated surface winds for landing were 7 knots." In addition, it stated that the "maximum demonstrated surface wind for take-off [was] 5 knots."

FAA-H-8083-11A Balloon Flying Handbook

In Chapter 3, "Preflight Planning," it stated "Almost all balloon flying is done in relatively benign weather conditions and mild winds. Most pilots prefer to launch and fly in winds less than 7 knots. While balloon flying is performed in higher winds, pilots accept that the faster the winds, the more they are exposed to risk and injury."

In Chapter 7, "Inflight Maneuvers," stated in part "One technique to determine if the balloon is ascending, flying level, or descending is to sight potential obstacles in the flight path of the balloon as the balloon approaches the wires, the pilot should determine how the wires (or other obstacles) are moving in his or her field of vision relative to the background. If they are moving up in the pilot's field of vision, or staying in stationary, then the balloon is on a descent that may place the pilot and passengers at risk. Conversely, if the wires are moving down in the pilot's field of vision, then the balloon is either in level flight or ascending, and able to clear the obstacle. Vigilance is required for constant scanning of the terrain along the flight path, and the pilot must be alert to avoid becoming fixated on sighting objects." In addition, it stated that "the balloon actually responds to a burn 6 to 15 seconds after the burner is used."

In Chapter 8, "Landing and Recovery," it 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."

In addition, Chapter 8 reviews, "To summarize, if there is an obstacle between the balloon and the landing site, the following are the three safe choices.

1. Give the obstacle appropriate clearance and drop in from altitude.
2. Reject the landing and look for another landing site.
3. Fly a low approach to the obstacle, fly over the obstacle allowing plenty of room, and then make the landing."

Lastly, Chapter 8 addressed a "high-wind landing," which stated "When faced with a high wind landing, the balloon pilot must remember that the distance covered during the balloon's reaction time is markedly increased. This situation is somewhat analogous to the driver's training maxim of "do not overdrive your headlights." For example, a balloon traveling at 5 mph covers a distance of approximately 73 feet in the 10 seconds it takes for the balloon to respond to a burner input—a distance equal to a semi-truck and trailer on the road. However, at a speed of 15 mph, the balloon covers a distance of 220 feet, or a little more than two-thirds of a football field. A pilot who is not situationally aware and fails to recognize hazards and obstacles at an increased distance may be placed in a dangerous situation with rapidly dwindling options."

Updated on Jan 13 2015 1:30PM

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<b>Landing Facility/Approach Information</b>					
Airport Name N/A	Airport ID:	Airport Elevation Ft. MSL	Runway Used N/A	Runway Length	Runway Width
Runway Surface Type: Not Applicable					
Runway Surface Condition:					
Approach/Arrival Flown: NONE					
VFR Approach/Landing: Straight-in					
<b>Aircraft Information</b>					
Aircraft Manufacturer EAGLE		Model/Series C-7		Serial Number EE207203	
Airworthiness Certificate(s): Balloon					
Landing Gear Type: None					
Amateur Built Acft? No	Number of Seats:	Certified Max Gross Wt. LBS		Number of Engines:	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection Hours		Airframe Total Time Hours	
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type No	ELT Operated?	ELT Aided in Locating Accident Site?			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner KIRK DANIEL T		Street Address			
		City HARTLY	State DE	Zip Code 199533027	
Operator of Aircraft KIRK DANIEL T		Street Address			
		City HARTLY	State DE	Zip Code 199533027	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Personal					
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**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 65
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Sex:	Seat Occupied: None	Occupational Pilot? Yes	Certificate Number: On File
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Certificate(s): Commercial

Airplane Rating(s): None

Rotorcraft/Glider/LTA: Free Balloon

Instrument Rating(s): None

Instructor Rating(s): None

Current Biennial Flight Review?

Medical Cert.: None	Medical Cert. Status:	Date of Last Medical Exam:
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	660									
Pilot In Command(PIC)										
Instructor										
Instruction Received										
Last 90 Days										
Last 30 Days										
Last 24 Hours										

Seatbelt Used?	Shoulder Harness Used?	Toxicology Performed? Yes	Second Pilot? No
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: None

Departure Point Doswell	State VA	Airport Identifier	Departure Time 1900	Time Zone EDT
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Destination Local Flight	State VA	Airport Identifier	
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Type of Clearance: None

Type of Airspace:

**Weather Information**

UAT C/S Source of Wx Information:  
Unknown

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<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
KOFP	2354	UTC	205 Ft. MSL	12 NM	183 Deg. Mag.
Sky/Lowest Cloud Condition: Few			12000 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: Broken		Ft. AGL	Visibility: 10	SM	Altimeter: 29.99 "Hg
Temperature: 28 °C	Dew Point: 14 °C	Weather Conditions at Accident Site: Visual Conditions			
Wind Direction: 180	Wind Speed: 10	Wind Gusts:			
Visibility (RVR): Ft.	Visibility (RVV) SM				
Precip and/or Obscuration: No Obscuration; No Precipitation					

<b>Accident Information</b>		
Aircraft Damage: Destroyed	Aircraft Fire: In-flight	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers	2				2
- TOTAL ABOARD -	3				3
Other Ground					
- GRAND TOTAL -	3				3

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National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**



NTSB ID: ERA14FA231

Occurrence Date: 05/09/2014

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

Heidi Moats

Additional Persons Participating in This Accident/Incident Investigation:

Michael Dows  
FAA/FSDO  
Richmond, VA