



Aviation Investigation Final Report

Location:	Fitzgerald, Georgia	Accident Number:	ERA12LA231
Date & Time:	March 16, 2012, 19:00 Local	Registration:	N14643
Aircraft:	FIREFLY BALLOONS INC FIREFLY 8	Aircraft Damage:	Substantial
Defining Event:	Windshear or thunderstorm	Injuries:	1 Fatal, 7 None
Flight Conducted Under:	Part 91: General aviation - Skydiving		

Analysis

The balloon pilot conducted multiple sport parachute flights throughout the day without obtaining a weather briefing. A SIGMET for severe thunderstorms, hail, and cloud tops to 45,000 feet was in effect for the area surrounding the takeoff and accident sites. Shortly after the balloon lifted off on the accident flight, the ground crew was advised of a severe storm warning for the area and observed the storm on radar via their cellular telephones. The crew contacted the pilot by radio to advise him that the storm was growing quickly. The pilot informed the ground crew that he would attempt to climb over the storm but shortly thereafter expressed doubts that the balloon would be able to rise over it.

The ground crew watched the balloon disappear into the clouds but continued to receive altitude and weather updates from the pilot via radio. The pilot described being battered by wind and heavy hail, and the altitude updates came quickly as the balloon climbed in an updraft. Around 12,000 feet, the pilot repeated, "I don't think I'm going to get over this thing." About 17,000 feet, the pilot advised that the balloon was descending and stated, "I got nothing over my head." In his last transmission to the crew, at an altitude of 2,000 feet, the pilot advised that he had the ground in sight. The crew dialed 911 and drove the chase vehicle in the direction where they thought the balloon would land. As they pursued the balloon through the storm, they experienced hard rain and hail "the size of golf balls." All major components of the balloon were recovered and a detailed examination indicated multiple envelope tears, including a few small puncture holes consistent with contact with trees. Several lines of the outer sheath had burned away, but the lines were intact with no evidence of fraying or wear.

Video footage taken by parachutists during the balloon's ascent on the accident flight captured

audio of the pilot's conversation with the ground crew and provided visual evidence of the developing storm as the balloon entered the base of the clouds. The footage then showed parachutists exit from the basket well after the balloon had entered the clouds and visual contact with the ground had been lost. According to the balloon manufacturer's emergency procedure for weather deterioration during flight, pilots should "land immediately rather than fly into severe atmospheric turmoil...Severe atmospheric forces are capable of taking over and exposing the flight to the hazards of immense envelope stresses and uncontrollable contact with the ground..."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's intentional flight into adverse weather. Contributing to the accident was the pilot's failure to obtain a weather briefing and his failure to follow the balloon manufacturer's published emergency procedure for weather deterioration during flight.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Hail - Decision related to condition
Personnel issues	Weather planning - Pilot
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Enroute-climb to cruise	Windshear or thunderstorm (Defining event)
Enroute-climb to cruise	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On March 16, 2012, about 1900 eastern daylight time, a FireFly 8 hot air balloon, N14643, was lost in flight after climbing into a storm near Fitzgerald, Georgia. On March 20, 2012, the balloon's envelope and basket were located in wooded terrain near Fitzgerald, Georgia. The pilot, who remained in the basket, was fatally injured. Visual meteorological conditions prevailed throughout the day of the accident, as the pilot conducted sport parachute flights under the provisions of Title 14 Code of Federal Regulations Part 91.

According to one of the ground crewman for the balloon, two flights had been conducted prior to the accident flight; one in the morning and one in the afternoon. Seven parachutists were loaded for the second afternoon flight, the balloon lifted off, and the ground crewmen boarded the chase vehicle and drove after the balloon. Minutes after beginning the drive, the crewmen received a "severe storm warning" from the local emergency management director by telephone.

The crewmen observed the storm on radar via their cellular phone, and contacted the pilot by radio to advise him that the storm was "getting big very quick." The pilot advised the parachutists to exit the balloon and the ground crew watched them exit. The parachutists reached the ground uninjured. The pilot requested another storm update, and informed the ground crew that he would "attempt to get over" the storm. Shortly after, he contacted the ground crew and expressed doubts that the balloon would be able to climb over the storm, and the ground crew then watched the balloon disappear into the clouds.

The pilot provided altitude and weather updates in 1,000-foot increments to the ground crewmen as the balloon climbed to an estimated 17,000 feet. He described being battered by winds and heavy hail, and the altitude updates came "quickly" as the balloon climbed in an updraft. Around 12,000 feet, the pilot again repeated, "I don't think I'm going to get over this thing."

At the top of the climb, the pilot advised, "I got nothing over my head," and that the balloon was descending. At an altitude of 2,000 feet, the pilot advised that he had the ground in sight.

The ground crew dialed 911 and drove the chase vehicle in the direction that they believed the

balloon would land. As they pursued the balloon through the storm, they experienced hard rain and hail "the size of golf balls." The driver lost control of the vehicle and slid into a ditch due to the weather conditions. Over the next two minutes, they estimated that 4 inches of hail accumulated on the ground.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with a rating for lighter-than-air-balloon, limited to hot air balloons with airborne heater. His most recent Federal Aviation Administration (FAA) third class medical certificate was issued March 4, 1997. A review of his pilot logbook by an FAA inspector revealed that the pilot had logged 1,108 total hours of flight experience. He had logged 19 hours in the year prior to the accident, of which 9 hours were in the 90 days prior to the accident.

AIRCRAFT INFORMATION

According to FAA records, the balloon was manufactured in 2007, and issued a standard airworthiness certificate on July 19, 2007. A review of maintenance records revealed the most recent annual inspection was completed March 10, 2011, at 106 total aircraft hours. As of March 10, 2012, the balloon had accrued 114 total aircraft hours.

METEOROLOGICAL INFORMATION

According to an NTSB meteorologist, weather radar echo intensities of Video Integrator and Processor (VIP) level 5 and 6 were recorded in the area of the accident site at the time of the accident. Levels 5 and 6 are described as "intense" and "extreme," respectively. These values indicated moderate to extreme conditions with severe turbulence, lightning, large hail, and extensive wind gusts.

Lightning flash data depicted a thunderstorm over the accident site at the time of the accident. Over 1,000 lightning flashes were recorded during the 30-minute period surrounding the accident time, with over 560 flashes recorded during the 15 minutes prior to the accident.

Dual-polarization (dual-pol) imagery scans of the storms surrounding the accident site revealed values indicative of rain and hail between 3,000 and 9,000 feet, dry snow, wet snow, and graupel (soft hail) between 9,000 and 13,500 feet, and a mix of dry snow and graupel between 14,500 and 20,000 feet.

The dual-pol imagery scans captured the area of the storm where the pilot reported the balloon was ascending in an updraft as hail struck the balloon.

Satellite images revealed the top of the storm at an estimated 36,000 feet. Hail algorithms estimated that hail reaching the surface was between .75 and 1.00 inches. According to the Sheriff who led the search for the balloon, the balloon envelope still contained large clumps of

frozen precipitation (hailstones) when it was found 3 days after the accident.

Significant meteorological information (SIGMET) advisory 57E was active for the accident site at the accident time. It warned of severe thunderstorms moving from 290 degrees at 15 knots, with tops to FL450, hail to 1 inch in diameter, with wind gusts to 50 knots possible.

Video footage taken by parachutists during the balloon's ascent on the accident flight was posted on a commercial website (<http://www.youtube.com/watch?v=Vd5VLWlxBAE>). The video provided altitude updates in subtitles, captured audio of the pilot's conversation with his ground crew, and provided visual evidence of the developing storm as the balloon entered the base of the clouds.

About the time the balloon entered the cloud, the pilot asked his ground crew by radio, "What phase is that cell in...That thunderstorm cell, what phase is it in...Is it building or is it dissipating?" The ground crew replied, "Building." To which the pilot stated, "I'm right on the edge of it then." Shortly thereafter, the pilot announced, "We're getting into this cloud."

The video footage then showed four parachutists exit from the basket well after the balloon had entered the clouds and visual contact with the ground had been lost.

A review of archived data revealed that the pilot did not obtain a weather briefing from either a flight service station briefer or a commercial vendor on the day of the accident.

WRECKAGE AND IMPACT INFORMATION

The wreckage was examined at the site on March 20, 2012, and all major components of the balloon were accounted for at the scene. The balloon was recovered, and a detailed was completed on April 10, 2012. The envelope exhibited two fabric tears, located six gores (panels) apart from one another, each measuring approximately 110 feet in length down the vertical load tapes (seam). The tears were located approximately 1/2 inch from the stitching of the seams.

There were two additional tears across the top horizontal load tape around the deflation port measuring approximately 12 feet in length. The stitching was intact, but the fabric was torn away just after the stitching.

A few small puncture holes were observed in the envelope, consistent with contact with trees. There was one small tear approximately two feet in length at the mouth horizontal seam. Several lines had the outer sheath burned away, but the lines were intact with no evidence of fraying or wear. There was no evidence of burns on the skirt.

The basket was largely intact. The floor was cracked diagonally across its full span, and the overhead frames were broken at two of four attachment points. The burner was largely intact, but displayed some impact damage.

The deflation valve and the deflation line were intact.

ADDITIONAL INFORMATION

According to Paragraph 4.12 of the FireFly Balloons Balloon Flight Manual, Weather Deterioration During Flight:

"Land immediately rather than fly into severe atmospheric turmoil. Risk damage if necessary to land while the flight is still under control. Severe atmospheric forces are capable of taking over and exposing the flight to the hazards of immense envelope stresses and uncontrollable contact with the ground..."

Pilot Information

Certificate:	Commercial	Age:	62, Male
Airplane Rating(s):	None	Seat Occupied:	
Other Aircraft Rating(s):	Balloon	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3	Last FAA Medical Exam:	March 4, 1997
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1108 hours (Total, all aircraft), 9 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	FIREFLY BALLOONS INC	Registration:	N14643
Model/Series:	FIREFLY 8	Aircraft Category:	Balloon
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	F8-2018
Landing Gear Type:	None	Seats:	
Date/Type of Last Inspection:	March 10, 2011 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:	8 Hrs	Engines:	0
Airframe Total Time:	114 Hrs at time of accident	Engine Manufacturer:	
ELT:	Not installed	Engine Model/Series:	
Registered Owner:	RISTAINO EDWARD	Rated Power:	
Operator:	RISTAINO EDWARD	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	FZG,365 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	19:15 Local	Direction from Accident Site:	240°
Lowest Cloud Condition:	Scattered	Visibility	9 miles
Lowest Ceiling:	11000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	220°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.13 inches Hg	Temperature/Dew Point:	29°C / 13°C
Precipitation and Obscuration:			
Departure Point:	Fitzgerald, GA	Type of Flight Plan Filed:	None
Destination:	Fitzgerald, GA	Type of Clearance:	None
Departure Time:	18:30 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	7 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 7 None	Latitude, Longitude:	31.718889,-83.075836(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Michael Denaro; FAA/FSDO; Atlanta, GA
Original Publish Date:	January 15, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=83161

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