Aviation Investigation Final Report

Location:	HARTSEL, Colorado	**Incident Number:**	DEN99IA154
Date & Time:	August 11, 1999, 08:30 Local	**Registration:**	N2570E
Aircraft:	Balloon Works FIREFLY 9	**Aircraft Damage:**	Minor
Defining Event:		**Injuries:**	6 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

As he approached the touchdown point, the pilot flared the balloon and pulled the deflation line. The line broke and fell into the basket. The pilot was unable to deflate the balloon because the line had broken inside the envelope near the parachute harness. The ground crew secured the balloon long enough for the passengers to exit, then the wind dragged it across the ground. Holes were cut in the middle portion of the envelope to gain access to the deflation valve, and the balloon was deflated. Examination of the deflation line by NTSB's Materials Laboratory disclosed glazing damage to the outer cover, typical of heat damage. According to the manufacturer, the Kevlar braided inner core chars at 890 degrees F. The nylon or polyester braided outer covering has a stick point of 430 degrees F. and a melting point of 492 degrees F. A new line has a nominal strength of 4,000 pounds.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: Total failure of the deflation line due to heat damage (as evidenced by glazing), most likely caused by the improper use of the flight controls (burner system) by person(s) unknown.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

1. (C) BALLOON EQUIPMENT,CONTROL SYSTEM - BURNED
2. (C) BALLOON EQUIPMENT,CONTROL SYSTEM - FAILURE,TOTAL
3. (C) REASON FOR OCCURRENCE UNDETERMINED

Factual Information

On August 11, 1999, approximately 0830 mountain daylight time, a Balloon Works Firefly 9, N2570E, owned and operated by Colorado Balloon Services, sustained minor damage during a landing in a field 9 miles east of Hartsel, Colorado. The commercial pilot and five passengers were not injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the personal flight being conducted under Title 14 CFR Part 91. The flight originated near Hartsel approximately 0730.

In his incident report, the pilot said that as he approached the touchdown point, he flared the balloon and pulled the deflation line. The line broke and fell into the basket. Unable to deflate the balloon (because the line had broken approximately 5 feet down from the parachute harness and 40 feet up from the skirt inside the envelope), the pilot radioed his ground crew for assistance. The balloon was secured long enough for the passengers to exit, then the wind velocity increased. It broke free and dragged across the ground. The pilot caught the balloon and cut holes in the middle portion of the envelope. The envelope deflated to the extent that he was able to grab the upper portion of the deflation valve and complete the deflation process.

According to Title 49 CFR Part 830.5(a)(1), "The operator of an aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board field office when [there has been a] flight control system malfunction or failure. . ." A parachute valve is considered to be a flight control on a balloon.

The pilot took the balloon to a repair station for repairs. The repair station owner was concerned with the mode of failure of the deflation line and, familiar with the above paragraph, notified the Denver NTSB Office and her FAA principal maintenance inspector.

The deflation line was sent to NTSB's materials laboratory for examination. Report No. 99-216 noted there was 1. glazing damage to the outer cover, typical of heat damage; 2. unraveled and missing outer cover, exposing the Kevlar inner core; 3. longitudinal compression of the outer cover; 4. discoloration of the outer cover, ranging from light to severe; and 5. the fracture, exposing fraying and unwinding of the Kevlar inner core fiber bundle. Light discoloration of the deflation line is typical of normal use. Two areas of moderate and severe discoloration "showed no signs of heat damage. The discoloration did not extend completely around the circumference of the line." According to Balloon Works, the Kevlar braided inner core chars at 890 degrees F. The nylon or polyester braided outer covering has a stick point of 430 degrees F. and a melting point of 492 degrees F. A new line has a nominal strength of 4,000 pounds.

Pilot Information

Certificate:	Commercial	**Age:**	42,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	Balloon	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	None Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Balloon Works	**Registration:**	N2570E
Model/Series:	FIREFLY 9 FIREFLY 9	**Aircraft Category:**	Balloon
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	F9-060
Landing Gear Type:		**Seats:**	0
Date/Type of Last Inspection:	May 11, 1999 Annual	**Certified Max Gross Wt.:**	3285 lbs
Time Since Last Inspection:	34 Hrs	**Engines:**	Unknown
Airframe Total Time:	285 Hrs	**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	EDWARD L. VANDE HOEF	**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	COLORADO BALLOON SERVICES	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	, CO (NONE)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	07:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	Full stop;Straight-in

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Minor
Passenger Injuries:	5 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	6 None	**Latitude, Longitude:**	39.019771,-105.800933(est)

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	DONALD P BORDONARO; DENVER , CO
Original Publish Date:	June 22, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47260