Aviation Investigation Final Report

Location:	ARK, Virginia	**Accident Number:**	BFO96LA009
Date & Time:	October 12, 1995, 17:30 Local	**Registration:**	N6348X
Aircraft:	AEROSTAR S49A RAVEN	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor reported that in an attempt to conserve fuel in the on-board fuel tank, he inflated the balloon for flight using an external fuel tank. He stated that when he attempted to disconnect the external fuel tank hose, the residual fuel ignited. The flight instructor and dual student exited the balloon, and the balloon lifted off the ground. The balloon remained airborne, unmanned, for about one mile before it touched down. Postaccident examination of the balloon revealed no evidence of preimpact mechanical malfunction. The flight instructor stated that the accident could have been prevented if the pilot light was turned off before switching fuel hose connections from external fuel tank to on-board fuel tank.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the flight instructor's improper procedures while inflating the balloon using an external fuel source, and the fuel leak.

Findings

Occurrence #1: FIRE
Phase of Operation: STANDING

Findings

1. (C) FLUID,FUEL - LEAK
2. (C) PROCEDURES/DIRECTIVES - IMPROPER - PILOT IN COMMAND

Factual Information

On October 12, 1995, at 1715 eastern daylight time, an Aerostar Raven S49A balloon, N6348X, caught fire during inflation at Ark, Virginia. The certificated flight instructor (lighter than air) and the dual student evacuated the balloon after the fire started and were not injured. The balloon was destroyed. The balloon was being operated as an instructional flight under 14 CFR 91 when the accident occurred. Visual meteorological conditions prevailed for the local flight, and a VFR flight plan was filed.

According to the flight instructor, he was inflating the balloon for the instructional flight using an external fuel tank. The flight instructor reported that when the balloon was inflated, he turned off the external tank valve and entered the basket. He reported that when he attempted to loosen the external tank fuel hose fitting, some residual fuel from the fuel hose leaked out and ignited at the pilot light of the burner. The flight instructor and dual student exited the basket, and the balloon lifted off the ground. The balloon remained airborne, unmanned, for about one mile before it landed in a timber cut area. The basket and the skirt were destroyed by fire.

The flight instructor reported that the accident balloon is equipped with a 20 gallon fuel tank, and that the inflation of the skirt uses about three to four gallons of fuel. He stated that "...it is important to carry as much fuel as possible on a balloon flight...as [a] safety precaution we use an additional 10 gallon aircraft certified spare tank for the inflation." He stated: "Before takeoff we switch the fuel system from the 'inflation' tank to the on board tank. This requires changing the feeding fuel hose from one tank to another. This technique has been practiced by many pilots and by myself for several years."

The flight instructor stated that he used the following procedure:

"Changing from the inflation tank to the in flight tank I have the following rules established: 1. Turn off the tank valve. 2. Bleed all the fuel out of the supply hose by using the burner to add heat to the envelope. 3. Disconnect the hose from the inflation tank and attach the in flight fuel tank hose. 4. Check new connection for leaks."

According to the Balloon manufacturer's representative, the flight instructor should have included turning off the pilot light valve, and ensuring that no residual flame was present in the burner in addition to the procedures above.

The aircraft was examined after the accident by an FAA Aviation Safety Inspector. The examination included inspecting the check valve for the inflation tank valve. The examination did not disclose evidence of mechanical malfunction. The flight instructor reported that there was no mechanical malfunction, and the accident could have been prevented if, "...turn off the

burner pilot light when changing fuel hose connections."

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	45,Male
Airplane Rating(s):	None	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	Balloon	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
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:	718 hours (Total, all aircraft), 7 hours (Total, this make and model), 692 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AEROSTAR	**Registration:**	N6348X
Model/Series:	RAVEN S49A RAVEN S49A	**Aircraft Category:**	Balloon
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	S49A-3060
Landing Gear Type:		**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	1500 lbs
Time Since Last Inspection:		**Engines:**	Unknown
Airframe Total Time:		**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	LEE WELL, LTD.	**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RIC ,168 ft msl	**Distance from Accident Site:**	40 Nautical Miles
Observation Time:	16:55 Local	**Direction from Accident Site:**	285°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	25°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	, VA	**Type of Flight Plan Filed:**	VFR
Destination:		**Type of Clearance:**	None
Departure Time:	17:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Drake-nurse, Beverley
Additional Participating Persons:	GEORGE BUSH; SANDSTON , VA
Original Publish Date:	March 21, 1996
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=9104