



Aviation Investigation Final Report

Location:	Mexican Hat, Utah	Accident Number:	DEN02LA109
Date & Time:	September 22, 2002, 15:30 Local	Registration:	N725ST
Aircraft:	Sabian Rans S-12XL	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot flew up the canyon, looking for a campsite for a future trip. Witnesses observed the aircraft make a "tight" U-turn in the canyon, and then deploy a parachute. The parachute separated from the airplane, and the airplane free fell, impacting the terrain. Witnesses heard the engine running, all the way to impact. A postimpact fire consumed the airplane. The Ballistic Recovery System (BRS), installed on this airplane was a BRS VLS (Vertical Launch System) 1200 model. The system contained a warning label that states "Aircraft Engine Must Be Shut Off Prior to Deploying Parachute. Failure to Do So May Result in Death or Serious Injury." The BRS unit was shipped to the pilot on August 9, 2002; he performed the installation. An examination of the airplane showed the two carabineers next to each other in the airplane wreckage. If the BRS system had been assembled properly, they should have been approximately 10 feet apart. The 14 foot 11-3/4 inch riser was found cut at one end. The other end was still attached to the suspension lines of the parachute. Approximately 4 feet of the riser was consumed by fire. The physical evidence revealed that the protective Kevlar bridle (resistant to propeller slashes) had been inadvertently removed from the BRS system during installation.

Probable Cause and Findings

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

the pilot's inadequate in-flight planning and decision making (flying up a canyon with insufficient altitude) which resulted in an inadvertent stall/mush, and the pilot's failure to follow the proper emergency procedures for activating his Ballistic Recovery System (shutting off his pusher engine before deploying the BRS parachute). Contributing factors were the improper installation of the BRS by the pilot which led to the subsequent severing of the parachute line by his propeller during deployment.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - UNCONTROLLED

Findings

1. (C) IN-FLIGHT PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
2. (C) AIRSPEED - INADEQUATE - PILOT IN COMMAND
3. STALL/MUSH - INADVERTENT - PILOT IN COMMAND
4. (C) EMERGENCY PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: MANEUVERING

Findings

5. EMERGENCY EQUIPMENT - ACTIVATED - PILOT IN COMMAND
6. (F) SAFETY SYSTEM(OTHER) - FAILURE
7. (F) MAINTENANCE,INSTALLATION - IMPROPER - OWNER/BUILDER

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

8. TERRAIN CONDITION - MOUNTAINOUS/HILLY
9. TERRAIN CONDITION - ROCK(S)/BOULDER(S)

Factual Information

HISTORY OF FLIGHT

On September 22, 2002, at approximately 1530 mountain daylight time, a Sabian Rans S12-XL, N725ST, was destroyed when it impacted terrain while maneuvering near Mexican Hat, Utah. The private pilot and passenger were both fatally injured. The airplane was being operated under Title 14 CFR Part 91. Visual meteorological conditions prevailed for the cross-country flight that originated from Blanding, Utah, at approximately 1405. No flight plan had been filed for the flight.

According to family members, the pilot was going camping the following weekend and wanted to "scout out" a location. According to a fuel receipt, time stamped at 1348, the pilot paid for 9.9 gallons of fuel in Blanding, Utah.

Witnesses observed the airplane fly up a small canyon in Cedar Mesa and make a "tight" 180 degree turn. They stated that a parachute was deployed and it appeared to be fully inflated. The parachute then separated from the airplane followed by the parachute and airplane descending towards the ground. The witnesses said the aircraft impacted the ground inverted. They stated the aircraft's engine was still running upon impact.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot received his first student certificate on November 3, 1982, and it was renewed on September 23, 1985. He completed all the requirements and passed his check ride for his private pilot's certificate on February 12, 2001. Additionally, on September 18, 2001, he received his Repairman Experimental Aircraft Certificate; he completed building his Rans S12-XL, N725ST, on August 9, 2001. The pilot was signed off to fly a Cessna 152 and got his flight review requirements reendorsed on May 14, 2001. He was issued a third class medical certificate on May 4, 2001. The certificate contained no waivers or limitations.

AIRCRAFT INFORMATION

The airplane, a Sabian Rans S12-XL, was manufactured by the pilot in 2001. It was equipped with a four cylinder, reciprocating, horizontally opposed, direct drive (gear reduced), air cooled, four stroke rear mounted pusher Rotax 912 S engine. The engine had a maximum takeoff rating of 100 horsepower at sea level. The propeller was a three-bladed warp drive composite propeller. Records indicate the pilot/builder performed an annual inspection on the airplane on September 14, 2002; these records did not indicate how many flight hours were on the airframe.

The Ballistic Recovery System (BRS), installed on this airplane, was a BRS VLS (Vertical Launch System) 1200 model. This system was designed for an aircraft with a gross weight of up to 1,200 pounds. The total parachute length was 16 feet and contained 32 gores (panels) with 32 suspension lines. Attached to the parachute was a 14 foot 11 3/4 inch nylon riser followed by a carabineer and a 10 foot Kevlar bridle (this was to protect the BRS from propeller strikes). The Kevlar bridle ended with another carabineer which was connected to harness attached to the aircraft. The system contained a warning label that stated "Aircraft Engine Must Be Shut Off Prior to Deploying Parachute. Failure to Do So May Result in Death or Serious Injury."

The pilot ordered his BRS unit on May 3, 2002; it was shipped on August 9, 2002. The pilot's wife flew with him once after the BRS unit was installed, several days before the accident flight.

METEOROLOGICAL INFORMATION

At 1553, the weather conditions at Cortez, Colorado (elevation 5,918 feet), 070 degrees, 63 nautical miles from the accident site, were as follows: wind 180 degrees at 10 knots; visibility 10 statute miles; sky condition, clear of clouds (below 12,000 feet); temperature 79 degrees Fahrenheit; dew point 27 degrees Fahrenheit; altimeter setting 30.24 inches. The density altitude, at the accident site, was calculated to be 8,144 feet.

WRECKAGE AND IMPACT INFORMATION

The aircraft was located in a remote rugged canyon in Cedar Mesa (N37 degrees, 19.19 minutes; W109 degrees, 57.19 minutes; elevation 5,681 feet), or 040 degrees, 29 nautical miles from the accident site to Blanding, Utah. Postimpact fire consumed the aircraft.

The rocket motor, a portion of the aircraft's BRS unit, was found with its sleeve near the accident site. The sleeve contained witness marks consistent with the marks from a propeller. According to a BRS representative, this indicated that the engine was producing power at the time the BRS unit was deployed. There was no evidence of fire on the sleeve assembly. The incremental bridle was fully stripped, indicating a full and complete extraction of the parachute and separation of the sleeve as designed.

Two #12 quick link carabineers were found in close proximity to one another at the accident site. According to BRS representatives, they should have been found at least 10 feet apart. One carabineer showed evidence of two or more Kevlar attachments. The other carabineer contained evidence of heat damage and contained no Kevlar residue.

According to BRS, the "slider was fully disreefed which suggested that the [para]chute reached full line stretch and inflat[ion] prior to separation." The nylon riser was severed at approximately 11 feet from the suspension line attachment point (carabineer to 10 foot Kevlar bridle). Overall nylon riser length for a BRS 1200 was 14 feet 11 3/4 inches. To verify the

possibility that the propeller, under power, cut the riser, a BRS representative measured the approximate distances between the location of the aircraft attachment harness, the engine hub and the propeller arc. The triangulated distance was approximately 48 inches, which was equal to the 4 feet of missing riser.

The parachute contained witness cuts on the bottom 36 inches of the parachute. The marks are consistent with a power-on propeller "which suggests that the sleeve came in contact with a power-on propeller during the deployment sequence." No evidence of propagation was noted on any of these cuts. The suspension lines, rocket and motor were unremarkable.

No preimpact engine or airframe anomalies, which might have affected the airplane's performance, were identified.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the State of Utah, Department of Health, Salt Lake City, Utah, on September 24, 2002. The FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma did not receive specimens to perform toxicology tests.

ADDITIONAL DATA

The airplane, including all components and logbooks, was released to a representative of the pilot's insurance company on September 25, 2002.

Pilot Information

Certificate:	Private	Age:	50, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	May 4, 2001
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	May 14, 2001
Flight Time:	250 hours (Total, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Sabian	Registration:	N725ST
Model/Series:	Rans S-12XL	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	03990875
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	September 14, 2002 Annual	Certified Max Gross Wt.:	1100 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	912S
Registered Owner:	Kenneth A. Sabian	Rated Power:	100 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	CEZ, 5918 ft msl	Distance from Accident Site:	63 Nautical Miles
Observation Time:	15:53 Local	Direction from Accident Site:	70°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	10 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.23 inches Hg	Temperature/Dew Point:	26°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Blanding, UT (BDG)	Type of Flight Plan Filed:	None
Destination:	Durango, CO (CD82)	Type of Clearance:	None
Departure Time:	14:05 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	37.321945,-109.955276

Administrative Information

Investigator In Charge (IIC):	Struhsaker, James
Additional Participating Persons:	Lynn S Higgins; FAA FSDO; Salt Lake City, UT Mark Thomas; BRS; South St. Paul, MN Gregg Ellsworth; BRS; South St. Paul, MN
Original Publish Date:	March 2, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=55743

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