Aviation Investigation Final Report

Location:	Reno, Nevada	**Accident Number:**	WPR15LA142
Date & Time:	April 5, 2015, 14:24 Local	**Registration:**	N27QV
Aircraft:	Schleicher ASW 27	**Aircraft Damage:**	Substantial
Defining Event:	Turbulence encounter	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airline transport pilot was conducting a local personal flight in a glider. The pilot reported that, while about 14,000 ft, he attempted to navigate through a gap in the clouds, but the clouds quickly filled in and engulfed the glider. The glider's airspeed increased, and the wings subsequently separated from the glider. The pilot bailed out of the glider and descended to the ground using a personal parachute; the glider fell to the ground in pieces.

Postaccident examination of the wreckage revealed no evidence of any preexisting structural anomalies. A review of weather conditions reported in the area about the time of the accident revealed sustained wind from the south between about 25 and 30 knots with gusts between 30 and 35 knots. Geostationary weather satellite imagery showed standing clouds over the region in the hour or two leading up to the accident, and polar-orbiting satellite data depicted clouds along the final portion of the glider's flightpath about 40 minutes before the accident. Given the clouds and wind, the atmosphere was likely unstable, which is indicative of severe, transient, and short-lived turbulence. It is likely that the glider encountered severe turbulence while the pilot was maneuvering it in the clouds, which caused the glider's airspeed to increase beyond its structural limitations and led to its in-flight breakup.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The glider's encounter with severe turbulent atmospheric conditions after the pilot inadvertently entered clouds, which led to his inability to maintain a proper airspeed and the subsequent in-flight breakup of the glider.

Findings

Aircraft	Spar (on wing) - Failure
Aircraft	Airspeed - Capability exceeded
Environmental issues	(general) - Effect on operation
Aircraft	Airspeed - Attain/maintain not possible

Factual Information

History of Flight

Maneuvering	VFR encounter with IMC
Maneuvering	Turbulence encounter (Defining event)
Maneuvering	Aircraft structural failure
Maneuvering	Part(s) separation from AC
Maneuvering	Off-field or emergency landing

On April 5, 2015, about 1424 Pacific daylight time, a Schleicher ASW-27, N27QV, broke up in-flight after entering clouds near Reno, Nevada. The pilot (sole occupant) sustained serious injuries, and the glider sustained substantial damage throughout. The glider was registered to, and operated by, the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for a majority of the flight, and no flight plan was filed. The flight originated from the Minden-Tahoe Airport (MEV) at about 0715.

The pilot reported that he took off from MEV and flew for about 6.5 hours. When passing Reno at about 14,000 feet the pilot attempted to navigate through a gap in the clouds. The clouds quickly filled in and engulfed the glider. Suddenly, the glider was going too fast and the wings separated from the glider. The pilot bailed out using a personal parachute.

Radar revealed that the glider approached Reno from the north along the ridgelines. About 9 miles north of Reno, the glider made a left turn followed by an elongated 360 degree turn and proceeded south towards Reno. Just south of Interstate 80 the glider path made a sharp turn toward the north and ended.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer	**Age:**	77,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	Glider	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 18, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 5, 2014
Flight Time:	20000 hours (Total, all aircraft), 190 hours (Total, this make and model), 18500 hours (Pilot In Command, all aircraft), 26 hours (Last 90 days, all aircraft), 19 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

The pilot, age 77, held an airline transport pilot certificate for airplane multiengine land, and commercial privileges for airplane single engine land, sea, and glider. The pilot also held a third-class airman medical certificate issued on April 18, 2014 with the limitation that he must have a hearing aid and glasses available. At the time of the accident, the pilot reported a total time of 20,000 flight hours, 190 of which were within the accident glider make and model.

Aircraft and Owner/Operator Information

Aircraft Make:	Schleicher	**Registration:**	N27QV
Model/Series:	ASW 27	**Aircraft Category:**	Glider
Year of Manufacture:	1998	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	27098
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	May 26, 2014 Annual	**Certified Max Gross Wt.:**	1100 lbs
Time Since Last Inspection:		**Engines:**	
Airframe Total Time:	1551 Hrs as of last inspection	**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

The high performance, single seat, low-wing glider, serial number 27098, was manufactured in 1998. The glider's most recent maintenance was an annual inspection that occurred on May 26, 2014 at an airframe total time of 1,551 hours.

The accident glider's wings contained one wing spar, which does not directly connect to the fuselage. Instead, the spar from each wing fastens together in the fuselage just aft of the cockpit with a two-pin tapered lug and clevis fitting. The left wing contains the lug portion, and the right wing contains the clevis portion of the fitting. Two fittings on each wing root rib engage two metallic pins on each side of the fuselage to transmit the wing lift forces into the airframe.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Day
Observation Facility, Elevation:	RNO,4415 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	14:55 Local	**Direction from Accident Site:**	126°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	28 knots / 34 knots	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	28°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	9°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Minden, NV (MEV)	**Type of Flight Plan Filed:**	None
Destination:	Minden, NV (MEV)	**Type of Clearance:**	None
Departure Time:	07:15 Local	**Type of Airspace:**	

The nearest weather reporting facility was at the Reno/Tahoe International Airport (RNO) which was about 3 miles southeast of the accident site. The surface observations at RNO around the time of the accident indicated sustained wind from the south at about 25-30 knots, with gusts to 30-35 knots. Remarks from the weather observer on the field identified altocumulus standing lenticular clouds, which may be consistent with wave action of the terrain.

A weather balloon was launched a few hours after the accident. The weather balloon indicated a southeasterly wind between 20-50 knots until about 15,000 feet when the wind was 50 knots.

Geostationary weather satellite imagery confirmed standing clouds over the regional terrain in the hour or two leading up to the event, and some polar-orbiting satellite data depicted clouds along the final portion of the glider's flight path about 40 minutes prior to the accident time.

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	39.525554,-119.809448(est)

Given the nature of the accident the National Transportation Safety Board investigator-in-charge did not conduct an on scene investigation. However, local law enforcement reported that the glider's components came to rest in various locations throughout the Reno area. The pilot landed on top of a

parking garage and the fuselage came to rest about 50 yards to the south. The right wing came to rest in a park about 1 mile northeast of the fuselage, and the left wing was inside of a vacant warehouse about 0.4 miles to the east of the main wreckage.

There were no ground injuries, and only minor damage to one vehicle.

Tests and Research

Postaccident examination of the airframe revealed that the glider's right wing failed in positive overload and the left wing slid out of the fuselage.

Right Wing

The right wing attachment point was mostly intact. There was a fracture in the fuselage above the attachment point; however, the wing pins that transmit the wing lift loads to the fuselage sustained no obvious deformation.

The main wing spar fracture point was near the fuselage. The upper spar cap fractured about 12 inches outboard of the glider centerline, and the lower spar cap fractured about 24 inches outboard of the glider centerline. About 5.5 feet of the upper spar cap and web was missing and about 3 inches of the lower spar cap was missing. Most of the inboard 5.5 feet of skin and leading edge was also missing. The outboard right wing was mostly intact, although it was fractured about 64 inches inboard of the tip; the wing tip and winglet were missing. Portions of both the aileron and flap were present with the remainder missing.

Left Wing

The left wing attachment point sustained damage. The forward wing pin had a slight aftward deformation at the tip and the hole in the end was elongated. The aft wing pin sustained significant aftward deformation. The fuselage structure above the left wing attachment point was fractured and the forward wing pin carry through was fractured.

All of the left wing wreckage was found in the vacant warehouse. The main spar fracture point of the left wing was about 75 inches outboard of the aircraft centerline. The left wing was also fractured about 64 inches inboard of the tip; the wing tip and winglet were missing. Portions of the aileron and flap were present with the remainder missing.

The main spar was intact with little damage from the fracture about 74 inches left of the centerline, through the center fitting, and to a point about 1-2 feet right of the centerline. The two spar pins were intact and installed in the tapered lug and clevis fitting. The lug on the left wing and the two forks of the clevis from the right wing were intact.

Additional Information can be found in the 'Structures Group Factual Report' document located in the public docket.

NTSB Recorders Laboratory

The glider was equipped with a flight data recorder that stored flight log data in non-volatile memory. During the accident sequence the flight data recorder sustained major impact damage and usable data was unable to be recovered from the device.

Additional information can be found in the 'Electronic Device Specialist's Factual Report' document located in the public docket.

Administrative Information

Investigator In Charge (IIC):	Link, Samantha
Additional Participating Persons:	Lee A Oscar; Federal Aviation Administration; Reno, NV
Original Publish Date:	February 13, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=90993