Aviation Investigation Final Report

Location:	Melville, New York	**Accident Number:**	WPR18FA155
Date & Time:	May 30, 2018, 13:48 Local	**Registration:**	N62382
Aircraft:	North American SNJ 2	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot departed the airport with the intention of joining five other airplanes to proceed on a cross-country formation flight. The rear seat passenger onboard one of the other airplanes and a witness on the ground watched as the accident airplane entered a steep, climbing right 180° turn to about 1,300 ft above ground level, then subsequently entered a spin that continued to ground contact. A video captured the airplane in a steep, nose-down angle rotating around its vertical axis before impacting the ground.

Postaccident examination revealed no anomalies with the airframe or engine that would have precluded normal operation, with the exception of some preexisting cracks in the cockpit heater assembly. However, these cracks would not have negatively impacted the pilot's ability to control the airplane. Toxicology of the pilot revealed the presence of carbon monoxide in his blood that was not the result of the postcrash fire, and further examination of the heater assembly revealed no cracks or holes in the exhaust pipe that would have allowed gases to mix with the cockpit air supply. Given the level of carbon monoxide detected, it is unlikely that the pilot experienced any symptoms, regardless of the source, and there was no evidence to suggest that any carbon monoxide in the pilot's system contributed to the circumstances of the accident. Therefore, it is likely that, during the climbing turn, the pilot exceeded the airplane's critical angle of attack and the airplane experienced an aerodynamic stall and inadvertent spin.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's exceedance of the airplane's critical angle of attack, which resulted in an aerodynamic stall, spin, and subsequent impact with terrain.

Findings

Aircraft	Angle of attack - Capability exceeded
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Initial climb	Loss of control in flight (Defining event)

On May 30, 2018, about 1348 eastern daylight time, a North American SNJ-2, N62382, was destroyed when it was involved in an accident near Farmingdale, New York. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 repositioning flight.

The airplane was one of six North American SNJ-2s operated by the Geico Skytypers. The accident flight was a formation flight to reposition the six airplanes from Republic Airport (FRG), Farmingdale, New York, to Patuxent Naval Air Station (NHK), Patuxent, Maryland, for an upcoming airshow. The pilot of the lead airplane (No. 1) departed and was holding northeast of the airport. He stated that his rear seat passenger watched the accident airplane (No. 6) pass underneath their airplane and enter a climbing, "high-G" turn. The accident airplane subsequently entered a spin that continued until it impacted the ground.

Flight track data showed the airplane depart from runway 14 and turn northeast, climbing to an altitude of about 1,200 ft mean sea level (msl), before turning northwest as it climbed to about 1,300 ft msl. The airplane then turned sharply right about 360° and started losing altitude. The airplane continued to lose altitude as it completed about three more 360° turns before the data ended in the vicinity of the accident site. (See Figure 1).

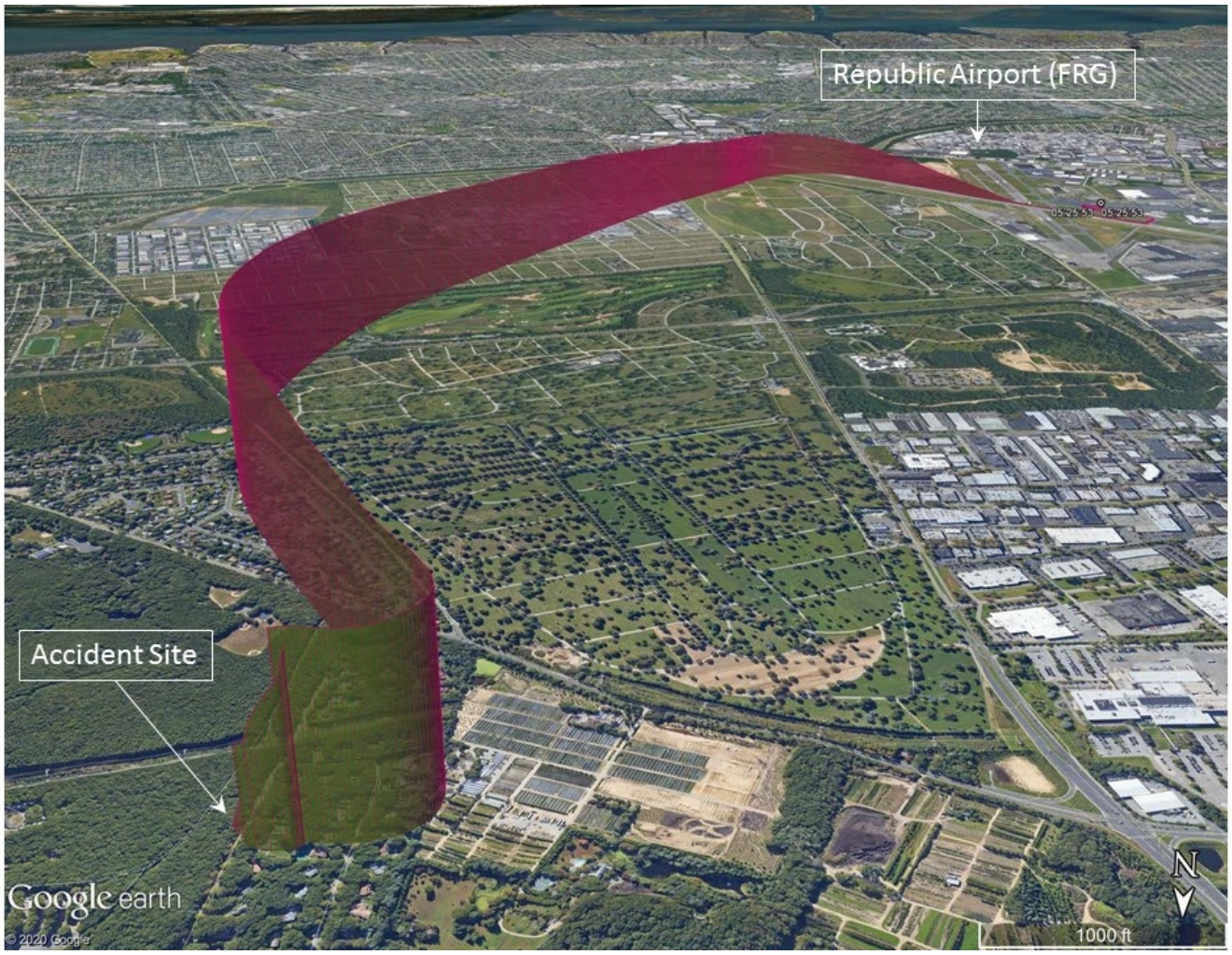

Figure 1-Accident Flight Track and Accident Site

A flight instructor who was in the traffic pattern for runway 14 at FRG reported that he watched the Nos. 5 and 6 airplanes depart toward the northwest. The instructor stated that he saw the No. 5 airplane initiate a climbing right 180° turn, similar to a chandelle maneuver, from about 800 ft above ground level (agl). He estimated that, throughout the turn, the bank angle of the airplane was about 70° to 80° until it reached about 1,200 ft agl, where it leveled off. He then watched as the No. 6 airplane conducted the same maneuver; however, at the top of the turn, the airplane entered a spin and remained in a constant-rate spin until ground impact. The instructor added that it appeared that the pilot did not attempt to recover from the spin.

A video provided by a witness located near the accident site captured the airplane in a steep, nose-down descent, rotating around its vertical axis until impacting the ground.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 None	**Last FAA Medical Exam:**	March 28, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	16125 hours (Total, all aircraft)		

The pilot's logbook was not recovered. The pilot had flown for the Skytypers air show team for over 10 years. During May 2018, he flew about 18 hours in the accident airplane and about 3 hours in the other Skytyper SNJ-2 airplanes.

Aircraft and Owner/Operator Information

Aircraft Make:	North American	**Registration:**	N62382
Model/Series:	SNJ 2 2	**Aircraft Category:**	Airplane
Year of Manufacture:	1940	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2039
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	March 21, 2018 100 hour	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5765 Hrs as of last inspection	**Engine Manufacturer:**	Pratt and Whitney
ELT:	Installed	**Engine Model/Series:**	R1340-AN-1
Registered Owner:		**Rated Power:**	550 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:	KFRG,81 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	211°
Lowest Cloud Condition:	Few / 1200 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.15 inches Hg	**Temperature/Dew Point:**	21°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Farmingdale, NY (FRG)	**Type of Flight Plan Filed:**	None
Destination:	PATUXENT RIVER, MD (NHK)	**Type of Clearance:**	Unknown
Departure Time:	13:45 Local	**Type of Airspace:**	

Airport Information

Airport:	REPUBLIC FRG	**Runway Surface Type:**	Asphalt
Airport Elevation:	80 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	6833 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal	**Latitude, Longitude:**	40.768333,-73.390274

The main wreckage and the wreckage debris were contained within a 50-ft radius. Several trees above and near the accident site were damaged, and limbs and large branches were found throughout the site. The first identified point of contact (FIPC) with the ground was a crater near the engine and propeller assembly. The main wreckage was upright, and the engine and propeller assembly were partially embedded in the crater. The main wreckage was mostly consumed by postimpact fire. All flight control surfaces were found at the accident site. (see Figure 2)

Figure 2-Accident Site

Following recovery of the wreckage from the site, flight control cable continuity was established throughout the airframe. The cabin heater assembly and associated exhaust pipe were removed from the engine. The exhaust pipe was buckled, and wear and openings were noted on the heater assembly. The connected scat tubing exhibited thermal damage. The heater assembly and associated pipe were sent to the NTSB Materials Laboratory for further examination, which revealed cracks along welds at the outboard ends where the interior and exterior walls of the heater assembly join. Weld segments overlapping the as-manufactured welds and welded patches consistent with repair welds were noted in multiple locations on the heater assembly. Preexisting cracks were identified, along with recent ductile overstress fractures as a result of the accident.

Medical and Pathological Information

The Suffolk County Office of the Medical Examiner, Suffolk County, New York, performed an autopsy of the pilot. The pilot's cause of death was multiple blunt impact injuries. No significant natural disease was identified. No soot was identified in the airways. A toxicology examination conducted in coordination with the autopsy found the pilot's carbon monoxide (CO) level at 10%.

Testing performed by the FAA's Forensic Sciences Laboratory did not identify CO (reporting cut off of 10%) or any other tested-for substances.

CO is an odorless, tasteless gas that is a product of combustion. When inhaled, it preferentially attaches to hemoglobin molecules in blood, inactivating their ability to carry oxygen. Nonsmokers may normally have up to 3% carboxyhemoglobin in their blood; heavy smokers may have levels of 10 to 15%. Symptoms from acute exposures are not generally expected until levels reach above 15%.

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew
Additional Participating Persons:	Christos E Tzavelis; FAA FSDO; Farmingdale, NY
Original Publish Date:	September 23, 2020
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97358