Aviation Investigation Final Report

Location:	East Moriches, New York	**Accident Number:**	ERA13FA032
Date & Time:	October 20, 2012, 15:04 Local	**Registration:**	N80823
Aircraft:	Swift Museum Foundation, Inc. GC-1A	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane departed with an adequate supply of fuel in the main fuel tank but an unknown amount of fuel in the tip tanks. After the airplane took off, the mechanic who performed the last condition inspection and who was near the departure end of the runway noted an unusual sound; he said the sound was abnormal and expected the pilot to return, but he did not. The airplane's GPS indicated that the flight proceeded south to the southern Long Island coastline then turned to the west, paralleling the coastline while climbing to a maximum altitude of 2,602 feet. The flight continued on the westerly heading along the southern coast of Long Island and descended to 2,383 feet and then turned north; the VHF transceiver was set to the Farmingdale automatic terminal information service. The flight continued on the northerly heading and descended to 1,812 feet, then turned to an easterly heading, followed by a southeasterly heading toward the southern coast of Long Island. The flight then turned back to an easterly heading with a steadily decreasing altitude and a steady groundspeed of about 86 knots. When just west of Moriches Inlet, the GPS altitude was noted to be 60 feet, and the groundspeed was 85 knots.

Several witnesses located near the crash site heard a sputtering engine. One witness stated that the airplane was running flawlessly, but he thought it was going to land because it was flying "way too slow." Another witness who was located about 1,000 to 1,500 feet west of the Moriches Inlet reported seeing a flock of birds take flight followed by the airplane pitching up and then pitching down into the inlet.

Postaccident inspection of the airframe, flight controls, engine, and engine systems revealed no evidence of preimpact failure or malfunction. Although minimal damage was noted on the

propeller, no evidence of a bird strike was noted on any component of the airplane. The flaps and landing gear were extended, consistent with a precautionary landing.

During the postaccident examination, the left side of the engine exhaust, where it enters the muffler, was circumferentially fractured at a weld, and cracks were noted in a weld-repaired area of the left side exhaust system components; the fracture and cracks can be attributed to overload as a result of impact. There was no evidence of exhaust gas escaping the repaired area. Further, no carbon monoxide was detected in specimens of the pilot or passenger taken during the postmortem examinations. Although a crack to the left side exhaust system had been detected 9 days earlier and repaired at a non-aviation facility, it did not play a role in the accident.

The fuel selector was found positioned to the tip tanks, both of which were breached during the impact sequence; therefore, no determination could be made as to the quantity of fuel in the tanks at the time of the accident. Although the remaining quantity of fuel in the main fuel tank was not quantified during the postaccident investigation, the airplane had only been operated for 40 minutes since the main fuel tank was filled; the main fuel tank can hold over 2 hours of fuel. No obstructions of the fuel supply from the main or tip tanks were noted, and the engine-driven fuel pump tested satisfactorily. Although about 6 ounces of water was drained from the main fuel tank, the water was consistent with ocean water; no other contaminants from the tank were noted. Water contamination was also noted from a sample of fuel and water drained from an open fuel supply line for the right tip tank; however, the right tip tank was breached and the water was likely from the ocean. No fuel or contamination was noted in the carburetor bowl.

Although a valve on the left side of the firewall was inoperative, which allowed heated air to enter the cockpit by the pilot's side, no determination could be made as to how or if that factored into the accident sequence. Further, that condition had been known by the pilot since September.

Based on the flight track and groundspeed recorded by the GPS and the fact that the landing gear and flaps were extended, it is likely that the pilot was performing a precautionary landing. However, the reason for the attempted precautionary landing could not be determined from the available evidence. Based on the witness statement of birds in the area, it is likely that during the precautionary landing, the pilot reacted to the birds by pitching the airplane up, stalled the airplane, and was unable to recover because of the low altitude.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to maintain airspeed, while attempting a precautionary landing for reasons that could not be determined from the available evidence. Contributing to the accident was the pilot's pitch-up reaction to birds that took flight during his approach for the precautionary landing, which resulted in an inadvertent stall.

Findings

Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	Animal(s)/bird(s) - Effect on operation
Personnel issues	Incorrect action performance - Pilot

Factual Information

History of Flight

Enroute	Unknown or undetermined
Maneuvering	Off-field or emergency landing
Maneuvering	Altitude deviation
Maneuvering	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On October 20, 2012, about 1504 eastern daylight time, a Swift Museum Foundation, Inc., GC-1A, N80823, owned by the pilot, impacted the water of Moriches Inlet, East Moriches, New York. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed for the 14 CFR Part 91 personal flight from Spadaro Airport (1N2), East Moriches, New York, to Republic Airport (FRG), Farmingdale, New York. The airplane was substantially damaged and the private pilot and 1 passenger were fatally injured. The flight originated from 1N2 about 1455.

The reported purpose of the flight was to return to FRG. An airframe and powerplant mechanic who signed off the last condition inspection was at the south end of 1N2 when the accident flight departed. He reported that what first caught his attention was the sound. The airplane at that time was past the departure end of the runway about 100 feet above ground level (agl), and he described hearing a noise from the engine he described as an “after noise.” He was asked if it was an after fire, and he advised it was not. He again referred to it as an “after noise”, which in all his years of experience he could not describe. Because of the noise which he perceived as abnormal, he expected the pilot to return but he did not. He did not observe any smoke trailing the airplane, which disappeared from his view. The witness was asked if he wears any hearing aide devices and he said he does, but at that time was not wearing them because they were in for repairs.

According to data downloaded from the on-board GPS receiver, after takeoff the flight proceeded south to the southern coast of long Island while climbing to 1,473 feet, then turned to the west paralleling the coastline climbing to a maximum altitude of 2,602 feet at 1459:10. The airplane continued on the westerly heading along the southern coast of Long Island and descended to 2,383 feet where at 1500:47, a right turn to the north was made. The flight continued on the northerly heading and descended to 1,812 feet, and at 1501:37, the flight turned to an easterly heading, followed by a southeasterly heading towards the southerly coast of Long Island. The flight then turned to an easterly heading with decreasing altitude and steady groundspeed value of approximately 86 knots. When just west of Moriches Inlet, at 1504:14, the GPS altitude was noted to be 60 feet and the groundspeed was 85 knots, while 7

seconds later, the GPS altitude was noted to be 87 feet and the groundspeed was 75 knots. The final GPS target at 1504:22 indicates the GPS altitude was 89 feet and the groundspeed was 67 knots. The last target was located at 40 degrees 45.8736 minutes North latitude and 072 degrees 45.396 minutes west longitude.

A witness driving eastbound on the beach approximately 200 yards west of the Moriches Inlet jetty reported the accident airplane flew over his vehicle about 30 feet agl. The witness heard a sputtering engine, and assumed that the airplane was in distress, and was going to land on the beach. He then lost sight of the airplane and assumed it had impacted the water in the inlet. He proceeded to the area and observed boaters secured the airplane with anchor lines. The comment about the sputtering engine was echoed by another witness located on the west jetty of Moriches Inlet.

One individual who was on the beach located 1,000 to 1,500 feet west of the Moriches Inlet reported seeing the airplane flying low in an easterly direction. The witness reported the airplane appeared to spook a flock of birds which became airborne, and then observed the airplane pitch up, followed by the nose pitching down; the airplane crashed into the water of the Moriches Inlet.

According to the Federal Aviation Administration (FAA) inspector-in-charge, the accident pilot did not establish contact with any FAA air traffic control facility at any time during the flight, and there was no radar data available for the accident flight.

PERSONNEL INFORMATION

The pilot, age 51, seated in the left seat, was the holder of a private pilot certificate with airplane single engine land rating. He was issued a third class medical certificate with no limitations on September 7, 2011. On the application for his last medical certificate he listed 480 hours as his total flight time, and 20 hours in last six months. There was no record of enforcement action, and he did not hold a repairman certificate.

Review of the aircraft insurance application dated August 21, 2012, with an effective date of August 25, 2012, indicates the pilot listed his total time to be 500 hours, and 15 hours were in a tailwheel equipped airplanes in the last 90 days. The application also indicates his last flight review was in July 2012.

The passenger, age 72, seated in the right seat, was last issued a student pilot medical certificate on August 16, 2006. On the application for his last medical certificate he listed a total time of 300 hours. There was no record that he obtained any further pilot certificates.

AIRCRAFT INFORMATION

The airplane was manufactured in 1946 by Globe Aircraft Corporation, Fort Worth, Texas, as model GC-1, and was designated serial number 226. It was certificated in the normal category

in accordance with Civil Air Regulation (CAR) 4A, and originally equipped with a 85 horsepower Continental C85-12 engine and a fixed pitch propeller.

An application was requested by Palomar Aviation, Inc., to place the airplane in the experimental category for the purpose of conducting flight tests on various modifications including installation of a 180 horsepower Lycoming O-360-A1A engine, leading edge change, rudder size change, and tip tank installation. The FAA Engineering & Manufacturing District Office (WE-41) approved the request on May 2, 1963, and issued operating limitations that expired November 2, 1963. The airplane remained in the Experimental Category by application every year until October 1979, at which time it remained in the experimental category with no expiration date.

The fuel system consisted of two tanks in the wing center section each located inboard of the wing outer panel attach point and also between the forward and aft spars, and two fiberglass fuel tanks installed at each wingtip, selectable by the fuel selector, and plumbed to the engine compartment. The two tanks installed in the wing center section are considered the main tank; the total capacity of the main tank is listed to be 27.8 gallons. While the capacity of each fiberglass tip tank was not determined by paperwork, the fuel selector indicated “176” for the left and right tip tanks respectively.

The engine was equipped with an exhaust system that is similar in design to that for a Mooney M20A or M20B airplane equipped with a Lycoming O-360 engine; however, it was modified.

Paperwork provided to FAA and NTSB indicates that the pilot purchased the airplane from the previous owner in December 2011. There was no record with the FAA that a registration application and bill of sale for his purchase were submitted to the agency. The pilot picked up the airplane on August 25, 2012, at Waterbury-Oxford Airport (OXC), Waterbury, Connecticut. The mechanic who performed the last condition inspection reported he did not perform a pre-buy inspection of the airplane for the pilot. Since purchase, the pilot based the airplane at the Republic Airport (FRG), located in Farmingdale, New York.

Heated air for the cockpit and cabin is provided by a shroud assembly which covers an exhaust manifold on the bottom forward portion of the engine. A scat hose connects to a duct on the shroud assembly and also to a valve located on the lower left portion of the firewall. A Bowden wire connected to a control knob on the co-pilot’s side of the instrument panel controls the valve which has a moveable flap on the engine compartment side of the valve and also a second flap located on the interior of the valve. By design, with the cockpit and cabin heat knob in the closed position, the flap on the interior is vertical or parallel to the firewall while the flap on the engine compartment side of the valve is open preventing heated air from entering the cockpit and allowing it to escape into the engine compartment.

Ram or fresh air to the cockpit and cabin is provided by a scat hose that connects to a duct at the engine cowling and also to a valve located on the lower center portion of the instrument panel. A Bowden wire connected to a control knob on the co-pilot’s side of the instrument

panel controls the valve which has a moveable flap on the engine compartment side of the valve and also a second flap located on the interior of the valve. By design, with the cockpit and cabin fresh air knob in the open or pulled position, the flap on the interior is horizontal or perpendicular to the firewall while the flap in the engine compartment is closed allowing fresh air to enter the cockpit.

The maintenance records were obtained from the airframe and powerplant mechanic who performed the last condition inspection. The airframe logbook contained only 1 entry and was for the last condition inspection which was signed off as being completed on October 11, 2012, or 9 days before the accident. The entry did not specify tachometer time nor airframe total time. The mechanic who performed the inspection later reported to the FAA-IIC that he signed the inspection off on the wrong date after being informed that the accident airplane was seen by another FAA inspector at FRG on October 8, 2012.

During the last condition inspection, the airframe and powerplant mechanic noted the left side exhaust was cracked. The exhaust was removed from the airplane, and taken to a non-aviation facility for repairs. The individual who performed the repair was interviewed by several FAA inspectors and the individual reported the general condition was, "…was about 50 percent good but pretty rotted and cracked at the 'Y' and very dirty." The person did not have a jig but eyed the repair for alignment, and used ER705-2 steel rod for the repair. The person recommended getting a new exhaust for the left side and he also stated that he had no prior experience welding an aircraft exhaust system.

The airframe and powerplant mechanic reported the repaired exhaust looked good and he advised the accident pilot to check for stress/misalignment when installing the exhaust. The mechanic reported the pilot informed him there was no stress/misalignment when he installed the exhaust system onto the engine.

The mechanic who performed the last condition inspection reported he began the inspection about 1 week before the accident. When asked what reference data he used (maintenance manuals, 14 CFR Part 43, homemade checklist, etc.) he said he did not have any data and based his inspection on his years of experience as a mechanic. He was asked if he test flew the airplane after the condition inspection was performed and he said no, but did state that the accident pilot flew it on 3 takeoffs and landings and after the flight did not report any discrepancies.

The engine logbook contained entries from February 2, 1960 to the last entry dated October 11, 2012. Further review of the engine logbook revealed an entry dated March 10, 1967, indicating the Lycoming O-360-A1A engine was given a major overhaul and then installed in the accident airplane. No entries were noted between March 10, 1967 and June 7, 1975; November 18, 1982, and May 5, 1998; May 5, 1998, and "8/08"; "8/08" and "9/10"; and "9/10" to "October 11, 2012." There was no record that the engine had been removed since installation in 1967, and there was no record excluding the entry for the last condition inspection indicating any work performed to the exhaust system.

Although the time since the last condition inspection could not be determined because the airframe and engine logbook entries did not contain the tachometer time, data downloaded from the installed global positioning system (GPS) receiver indicates that on October 7th, the GPS recorded the position to be at 1N2, and about 25 minutes later the GPS recorded the position to be on the ramp at FRG, which is the airport where the airplane is based. Recorded or calculated ground speed values were consistent with flight. Two roundtrip flights were recorded on October 13, 2012, and also on October 18, 2012. The total flight duration for the flights on October 13 totaled approximately 1 hour 27 minutes, while the total flight duration for the flights on October 18 totaled approximately 1 hour 12 minutes. The next recorded flights occurred on the accident date.

METEOROLOGICAL INFORMATION

A surface observation weather report taken at HWV Airport at 1456, or approximately 10 minutes before the accident indicates the wind was from 200 degrees at 12 knots, the visibility was 10 miles, and clear skies existed. The temperature and dew point were 19 and 14 degrees Celsius respectively, and the altimeter setting was 29.68 inches of Mercury. The accident site was located approximately 5.8 nautical miles and 123 degrees from the HWV Airport.

FLIGHT RECORDERS

The airplane was not equipped, nor was it required to be equipped, with a cockpit voice recorder (CVR) or flight data recorder (FDR). However, the airplane was equipped with a Garmin GPSMAP 196 global positioning system (GPS) receiver. The component was retained and shipped to the NTSB Vehicle Recorders Laboratory located in Washington, DC.

Upon arrival at the Vehicle Recorder Laboratory, internal corrosion was noted. The main board was removed and rinsed in fresh water, and then air dried. The non-volatile memory chip was removed from the board, the memory image downloaded, and the contents decoded.

The track data extracted spanned the time period from August 26, 2012 through October 20, 2012. The accident flight was recorded starting at 18:50:41 UTC and ending at 19:04:22 UTC. Extracted data concerning the accident flight were overlayed onto Google Earth, and also placed in an Excel spreadsheet; the report is contained in the NTSB Public Docket.

WRECKAGE AND IMPACT INFORMATION

The wreckage came to rest near the west edge of the Moriches Inlet jetty, East Moriches, New York; the airplane was inverted. Bystanders who watched the crash tied ropes to the airplane in an effort to keep it from sinking to the bottom. The wreckage was located at 40 degrees 45.9 minutes North latitude, and 072 degrees 45.3 minutes West longitude.

The airplane and all observed components were recovered from the water the same day about

2300 hours local. Pictures of the airplane following recovery from the water provided by the Suffolk County Police Department depict the right wing still attached. The right wing was removed, and the wreckage was transported to the Suffolk County Police Department Impound yard where it was secured.

Following recovery, the wreckage was inspected by NTSB, representatives of the FAA, and a representative of the engine manufacturer. All components necessary to sustain flight with the exception of both flaps were recovered. Inspection of all recovered components revealed no evidence of bird strikes. As first viewed, the left wing was fractured and separated just outboard of the attach point, but recovered. The horizontal and vertical stabilizers were separated, but recovered. The engine remained attached to the airframe and the propeller remained attached to the engine. A portion of the lower cowling remained partially attached; however, the upper engine cowling was not located or recovered.

Examination of the left wing and wing center section revealed the main spar remained attached to the inboard attach point but was bent aft and fractured due to bending overload about 12 inches outboard of the attach bolt. The aft spar attach bolt was in place but the aft spar fitting was bent forward and overload fractured about 1 inch outboard of the attach bolt. The separated section of the wing exhibited a 45 degree compression wrinkle on the upper wing skin surface that begins about midspan of the aileron extending through the main and aft spars to about the outboard edge of the aileron. Both aileron control cables remained attached to the bellcrank near the control surface, and were pulled inboard towards the fuselage tearing the upper wing skin for about 21 inches. The cables were fractured and exhibited tension overload near the wing attach. The aileron containing a fixed tab remained attached at all three hinge points but the flap was separated and not recovered. The flap actuator push/pull rod near the control surface was fractured and exhibited tension overload. The inboard bearing bracket was not fractured, while the middle flap hinge was bent outboard with a section of flap still attached. The outboard flap/aileron hinge bracket was bent outboard. The inboard 39 inches of the leading edge was crushed. The fuel cap was in place, and with the airplane in a nose-low attitude, fuel escaped from the opening when the fuel cap was unscrewed. Although the amount of fuel was not quantified, it was consistent with a nearly full fuel tank. The tip tank was separated but recovered; no fuel remained in the breached tank. The aluminum fuel supply line from the tip tank was fractured near the wing separation point. Air was blown into the fuel line at the fracture point and no obstructions were noted from the line fracture point to the engine compartment with the fuel selector in the as-found “B” position. The main landing gear was down and locked. The flap actuator push/pull rod exhibited bending overload approximately 9 inches outboard from the bellcrank attach point near the actuating cylinder.

Examination of the right wing and wing center section revealed the outer wing panel was removed at the attach point by normal disassembly method during the recovery process. The main spar was displaced aft. Fuel was dripping from the tip tank fuel supply line where disconnected for recovery at the wing attach point. The dripping fuel was captured into a glass jar and found to be blue colored fuel consistent with 100LL mixed with water. The inboard 38 inches of the wing leading edge was crushed aft. The tip tank remained attached but was

breached and did not contain any fuel; air was blown into the tip tank fuel supply line at the wing attach point and no obstructions were noted from the line to the engine compartment with the fuel selector in the as-found “B” position. The aileron equipped with a fixed tab remained attached at all hinges. The middle hinge of the aileron was bent inboard. The aileron flight control cables remained connected to the bellcrank near the control surface but were cut near the wing attach point during the recovery process. The flap was separated and not recovered. The flap actuator push/pull rod remained connected to the flap attach bracket, while the inboard flap hinge hole showed deformation of the hole. The middle flap hinge has section of flap attached by the bolt, castellated nut, and cotter pin. The remaining portion of the flap exhibited overload fracture. The outboard flap hinge has the bracket attached. A metal fuel tank was installed in the wing cavity; however, it was not equipped with a provision for a fuel cap. The main landing gear was down and locked. A compression wrinkle was noted in the lower wing skin from the leading edge of the wing to the aft spar of the wing; the wrinkle was noted between the middle and outboard aileron hinges. The flap actuator push/pull rod exhibited bending overload approximately 15 inches outboard from the bellcrank attach point near the actuating cylinder.

Examination of the fuselage and empennage revealed the fuselage was circumferentially fractured near the rear window and remained connected by the battery cable and flight control cables. Compression wrinkles were noted on the right side of the fuselage aft of the battery compartment area. The vertical stabilizer was separated from the airplane but recovered. The front spar attach rivets of the vertical stabilizer were sheared, and the aft spar bracket exhibited overload fracture. The separated vertical stabilizer exhibited a compression wrinkle on the right side indicating displacement to the right. The rudder was separated from the vertical stabilizer but remained connected to the airplane by the flight control cables. The upper and lower rudder attach bolts remained connected to the vertical stabilizer. Both horizontals were separated at the root but recovered; the structure exhibited overload failure. Both elevator primary control surfaces remained connected to each separated horizontal stabilizer, while the elevator trim tab remained attached to the left elevator. The elevator push/pull rods exhibited cup and cone fractures consistent with tension overload. The elevator trim tab appeared neutral; the elevator trim tab actuator drum exhibited 6 wraps on the forward side and 4 wraps on the aft side, also consistent with the neutral position. The elevator jackscrew had 4 full threads exposed aft of the trim tab actuator housing. The flap actuator cylinder was at the forward stop consistent with the flaps full down position.

Examination of the cockpit revealed the front windshield was nearly completely missing. The No. 1 communication transceiver was set to the FRG airport automated terminal information service (ATIS) frequency of 126.650 megahertz. A knob located on the co-pilot’s side of the instrument panel that controlled the cockpit and cabin heat was partially extended, while a knob that controlled fresh air into the cockpit and cabin was extended about 1.75 inches and was bent to the right. Bowden wire continuity was established for both knobs; however, movement of the knob for the cabin heat did not move the valve at the firewall, it only resulted in flexing of the cable housing that was only secured by 1 plastic tie wrap. The corresponding valve positions on the cockpit and firewall sides were both open, though impact damage was

noted to the lower left portion of the firewall. Also, the housing near the control knob was split, and bent to the left, which allowed movement of the cable housing with movement of the knob. The second valve installed on the lower center portion of the firewall which allows ram or fresh air into the cockpit and cabin was completely closed on the firewall side. The fuel selector was found positioned to the “B” position and was in the detent, which corresponded to fuel being supplied by both wing tip fuel tanks.

An approximate 9 ounce sample was collected from the main fuel tank. The 9 ounce sample consisted of approximately just under 6 ounces of cloudy water consistent with salt water and the remainder being blue colored fuel consistent with 100LL. A second sample of 8 ounces was collected which consisted entirely of blue colored fuel consistent with 100LL.

Testing of the fuel supply system was performed with the fuel selector position to the main position; no obstructions were noted to the engine compartment.

Examination of the Lycoming O-360-A1A engine, serial number L-2038-36, revealed the No 3 cylinder top spark plug lead was finger loose; however, abrasion damage was noted to the barrel nut. Additionally, the intake and exhaust valve pushrod seals for the No. 4 cylinder were noted to be pushed in; however, impact damage on the left side of the engine was noted, and there was no evidence of an oil leak in the area. The exhaust stack assembly for the No. 2 cylinder was separated at the inlet of the muffler. A crease on the lower portion of the No. 2 cylinder exhaust stack extended from the fracture surface forward approximately 3.0 inches in length. The crease nearly collapsed the complete wall thickness near the fracture surface and was progressively less in depth moving forward, while the mating fracture surface at the muffler did not exhibit any discernible deformation. The oil filler dipstick was in place but separated at the engine attach point; safety wire securing the dipstick to the engine was broken. Crankshaft, camshaft, and valve train continuity was confirmed, and suction and compression was noted in each cylinder during hand rotation of the crankshaft. Borescope examination of each cylinder revealed no anomalies noted. Magneto to engine timing could not be confirmed because the ring timing gear was fractured; however, both magnetos were tightly secured to the accessory case. The magnetos were removed from the engine, dried using compressed air, and rotated by hand revealing spark at all ignition towers. The carburetor was fractured across the throttle bore and was retained by the throttle, mixture, and carburetor heat control cables. Disassembly inspection of the carburetor revealed no fuel or debris inside the carburetor float bowl, and no anomalies noted. Inspection and hand operation of the engine-driven fuel pump revealed no discrepancies noted. The auxiliary fuel pump which remained attached to the firewall was inspected by removal of the pump filter; no debris was noted. The filter had an odor consistent with that of aviation fuel. A section of exhaust from the No. 2 cylinder was retained for further examination.

The exhaust system was loosely attached to the engine, and the lower engine cowling was placed in proper position in order to mock-up the components. Although impact damage was noted to the No. 2 cylinder exhaust riser which caused damage at the repaired area of the exhaust, the mock-up depicted heat damage on the interior surface of the cowling and the

proximity of the exhaust system components.

Examination of the propeller which remained secured to the engine revealed blade marked “A” exhibited spanwise scratches on the cambered side of the blade and did not exhibit any appreciable bend or blade twisting, while the blade marked “B” exhibited some chordwise and spanwise scratches on the cambered side of the blade and was bent aft about 5 degrees at about ¾ span and was twisted towards low pitch.

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examinations of the pilot and passenger were performed by the Suffolk County Medical Examiner’s Office. The cause of death for both was listed as blunt force trauma.

Forensic toxicology was performed on specimens of the pilot and passenger by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, and also the Division of Medical-Legal Investigation and Forensic Sciences, Suffolk County, New York. The toxicology report for the pilot by FAA stated the results were negative for carbon monoxide, cyanide, ethanol, and tested drugs. The toxicology report for the pilot by the Division of Medical-Legal Investigation and Forensic Sciences stated the results were negative for ethanol, carbon monoxide, basic and acidic drugs.

The toxicology report for the passenger by FAA stated the results were negative for carbon monoxide, cyanide, ethanol, and tested drugs. The toxicology report for the passenger by the Division of Medical-Legal Investigation and Forensic Sciences stated the results were negative for ethanol, carbon monoxide, basic and acidic drugs.

TEST AND RESEARCH

An individual who was in Moriches Inlet on a boat equipped with a recording camera provided the SD card and operating software to NTSB Vehicle Recorder Division in an effort to determine if the accident sequence was captured.

According to the NTSB Image Recorder Specialist’s Factual Report, no files were found on the SD card. Recovery software was used to recover a large number of proprietary video files; however, no video files depicted the accident site. The owner of camera reported to NTSB there may have been operational issues with the recording system at the time of the accident.

On the morning of the accident date the pilot flew from FRG (home base airport) to Brookhaven Airport (HWV); the flight duration was about 41 minutes as determined by the on-board GPS receiver. The pilot did not fly while at HWV, and while there about 1220, the main tank was filled per his request. The flight departed HWV about 1247, and flew to 1N2 arriving there about 1318 based on GPS data. While there the pilot and passenger had lunch with a friend at the airport; no maintenance was performed while at 1N2.

The individual who had lunch with the pilot and passenger advised the NTSB that while at lunch, the pilot “looked sweaty, but the doctor was not.” She stated that the pilot was heavy in the stomach and the doctor/passenger was thin. She said goodbye to the pilot, and both occupants boarded the airplane which was then taxied to the approach end of runway 18, and paused. The witness at that time was located outside on the east side of the departure end of runway 18.She watched the takeoff and noted the airplane rotated about the first 1/3 of the runway, began climbing and noted the landing gear retracted. To her the engine sounded fine during the takeoff. She also reported that the pilot flew the airplane into 1N2 on September 1st or 2nd, 2012, and after arrival he complained about the heater and the fact that he could not shut it off.

Examination of the retained portion of the exhaust by the NTSB Materials Laboratory revealed the fracture surface exhibited a rough grainy surface consistent with an overload event, on a uniform pipe thickness that measured 0.027 to 0.025 inch thick. No evidence of preimpact failure or malfunction was noted. Examination of the repaired area of the exhaust revealed the patch repairs displayed a rough uneven lumpy appearance but did not exhibit any indications of escaping exhaust gases. Further, cracks in the weld repaired area were consistent with compression buckling related to impact damage.

Pilot Information

Certificate:	Private	**Age:**	51,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	September 7, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 1, 2012
Flight Time:	500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Swift Museum Foundation, Inc.	**Registration:**	N80823
Model/Series:	GC-1A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	226
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	October 11, 2012 Condition	**Certified Max Gross Wt.:**	1570 lbs
Time Since Last Inspection:	3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-360-A1A
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HWV,81 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	14:56 Local	**Direction from Accident Site:**	303°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.68 inches Hg	**Temperature/Dew Point:**	19°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	East Moriches, NY (1N2)	**Type of Flight Plan Filed:**	None
Destination:	Farmingdale, NY (FRG)	**Type of Clearance:**	None
Departure Time:	14:55 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	40.764999,-72.754997(est)

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Michael Torns; FAA/FSDO; Farmingdale, NY James M Childers; Lycoming; Williamsport, PA
Original Publish Date:	September 30, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=85377