



National Transportation Safety Board Aviation Accident Final Report

Location:	Hollywood, FL	Accident Number:	ERA12FA023
Date & Time:	10/12/2011, 1334 EDT	Registration:	N37SV
Aircraft:	SOCATA TBM 700	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General Aviation - Flight Test		

Analysis

In anticipation of the maintenance test flight, a about 72 gallons of fuel was added to the left fuel tank to balance the fuel load. During the preflight, the pilot noted that the left tank had 105 gallons and that the right tank had 108 gallons. Because of the fuel level indications, the pilot did not visually inspect the tanks; even if he had done so the wing dihedral would have prevented him from seeing the fuel level.

About 20 minutes after takeoff, the pilot received the first annunciation of “Fuel Low R,” which lasted for about 10 seconds then went out. This indicates the fuel quantity is less than or equal to 9 gallons of usable fuel in the right tank. The pilot attributed this to a malfunction of the low fuel level sensor, since the fuel gauge showed about 98 gallons of fuel. He instructed the right front seat occupant (the mechanic) to make a note so the sensor would be replaced after the flight. Shortly thereafter, the amber “Fuel Unbalance” illuminated, and indicated that the right fuel quantity was greater than the left; as a result the pilot switched the fuel selector to the right tank.

He then initiated a descent to 10,000 feet to perform system checks, and after levelling off at that altitude for about 15 minutes, received a second “Fuel Low R” annunciation; he verified that the fuel selector automatically switched to the left tank and noted that the message went out after about 10 seconds. Either before or during a descent to 4,000 feet, the second “Fuel Unbalance” annunciation occurred. The right tank again depicted a greater quantity of fuel, so the pilot again switched the fuel selector to the right tank. The flight continued to a nearby airport, where the pilot terminated an instrument approach with a low approach. The flight then proceeded to the destination airport and entered the traffic pattern on a left downwind leg..

While on the downwind leg, the pilot received the third “Fuel Unbalance” annunciation and at this time the left fuel gauge indicated 55 gallons while the right fuel gauge indicated 74 gallons. Because he intended to land within a few minutes, the pilot manually selected the fullest (right) tank, then turned to base then final. While at 800 feet on final approach, the red warning message “Fuel Press” illuminated and the engine lost all power. Attempts to restore engine

power were unsuccessful. Unable to reach the airport, the pilot landed on a nearby turnpike. Both fuel tanks were breached, and fuel leakage, likely from the left fuel tank, was noted at the site. Inspection of the fuel outlet filter on the engine and the fuel sequencer reservoir considered an airframe item revealed both contained minimal fuel consistent with fuel starvation from the right fuel tank that actually did not contain an adequate supply of fuel.

Postaccident operational testing of the engine revealed no evidence of preimpact failure or malfunction that would have resulted in the loss of power. Examination and testing of the right fuel gauge harness revealed that a high impedance shielded cable was not correctly soldered to the shielding braid when the airplane was manufactured, which resulted in erroneous high readings of the fuel quantity in the right tank.

Several opportunities existed to detect the fuel quantity errors in the right tank during the airplane's 600-hour and annual inspection, which was signed off the day before. Several times during the inspection, electrical power was applied and different fuel quantities for the right tank were displayed, yet nothing was done to determine the reason for the different fuel indications. For example, 41 gallons was displayed, yet 70 gallons was drained; the fuel was returned to the tank after maintenance, yet the gauge showed 51 gallons, and after a post-maintenance run was performed, the gauge showed over 140 gallons even though it hadn't been fueled. Maintenance personnel incorrectly attributed the difference to fuel migration. Further, the pilot had the opportunity to terminate the test flight after multiple conflicting indications from the right tank, yet he continued the test flight, which resulted in fuel starvation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to terminate the flight after observing multiple conflicting errors associated with the inaccurate right fuel quantity indication. Contributing to the accident were the total loss of engine power due to fuel starvation from the right tank, the inadequate manufacturing of the right fuel gauge electrical harness, and failure of maintenance personnel to recognize and evaluate the reason for the changing fuel level in the right fuel tank.

Findings

Aircraft	Fuel indication system - Malfunction (Cause) Fuel - Fluid level (Factor) Fuel indication system - Incorrect service/maintenance (Factor) Fuel indication system - Design (Factor)
Personnel issues	Understanding/comprehension - Pilot (Cause) Use of available resources - Pilot (Cause) Understanding/comprehension - Maintenance personnel (Factor)
Environmental issues	Terrain - Contributed to outcome
Organizational issues	Equipment manufacture - Manufacturer (Factor)

Factual Information

HISTORY OF FLIGHT

On October 12, 2011, about 1334 eastern daylight time, a Socata TBM 700, N37SV, registered to SV Leasing Company of Florida, operated by SOCATA North America, Inc., sustained substantial damage during a forced landing on a highway near Hollywood, Florida, following total loss of engine power. Visual meteorological conditions prevailed at the time and an instrument flight rules (IFR) flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 maintenance test flight from North Perry Airport (HWO), Hollywood, Florida. The airline transport pilot and pilot-rated other crewmember sustained minor injuries; there were no ground injuries. The flight originated from HWO about 1216.

The purpose of the flight was a maintenance test flight following a 600 hour and annual inspection.

According to the right front seat occupant, in anticipation of the flight, he checked the fuel load by applying electrical power and noted the G1000 indicated the left fuel tank had approximately 36 gallons while the right fuel tank had approximately 108 gallons. In an effort to balance the fuel load with the indication of the right fuel tank, he added 72.4 gallons of fuel to the left fuel tank. At the start of the data recorded by the G1000 for the accident flight, the recorded capacity in the left fuel tank was approximately 105 gallons while the amount in the right fuel tank was approximately 108 gallons.

The PIC reported that because of the fuel load on-board, he could not see the level of fuel in the tanks; therefore, he did not visually check the fuel tanks. By cockpit indication, the left tank had approximately 105 gallons and the right tank had approximately 108 gallons. The flight departed HWO, but he could not recall the fuel selector position beneath the thrust lever quadrant. He further stated that the fuel selector switch on the overhead panel was in the "auto" position.

After takeoff, the flight climbed to flight level (FL) 280, and levelled off at that altitude about 20 minutes after takeoff. While at that altitude they received a "Fuel Low R" amber warning CAS message on the G1000. He checked the right fuel gauge which indicated 98 gallons, and confirmed that the fuel selector automatically switched to the left tank. After about 10 seconds the amber warning CAS message went out. He attributed the annunciation to be associated with a failure or malfunction of the sensor, and told the mechanic to write this issue down so it could be replaced after the flight. The flight continued and they received an amber warning CAS message, "Fuel Unbalance" which the right fuel tank had more fuel so he switched the fuel selector to supply fuel from the right tank to the engine. The G1000 indicates they remained at that altitude for approximately 8 minutes.

He then initiated a quick descent to 10,000 feet mean sea level (msl) and during the descent accelerated to V_{mo} to test the aural warning horn. They descended to and maintained 10,000 feet msl for about 15 minutes and at an unknown time, they received an amber warning CAS message "Fuel Low R." Once again he checked the right fuel gauge which indicated it had 92 gallons and confirmed that the fuel tank selector automatically switched to the left tank. After about 10 seconds the CAS message went out. Either just before or during descent to 4,000 feet, they received an amber CAS message "Fuel Unbalance." Because the right fuel gauge indicated the fullest tank was the right tank, he switched the fuel selector to supply fuel to the engine

from the right tank.

The flight proceeded to the Opa-Locka Executive Airport, where he executed an ILS approach which terminated with a low approach. The pilot cancelled the IFR clearance and proceeded VFR towards HWO. While in contact with the HWO air traffic control tower, the flight was cleared to join the left downwind for runway 27L. Upon entering the downwind leg they received another amber CAS message "Fuel Unbalance" and at this time the left fuel gauge indicated 55 gallons while the right fuel gauge indicated 74 gallons. Because he intended on landing within a few minutes, he put the fuel selector to the manual position and switched to the fullest (right) tank.

Established on final approach to runway 27L at HWO with the gear down, flaps set to landing, and minimum speed requested by air traffic for separation (85 knots indicated airspeed). When the flight was at 800 feet, the red warning CAS message "Fuel Press" illuminated and the right seat occupant with his permission moved the auxiliary fuel boost pump switch from "Auto" to "On" while he, PIC manually moved the fuel selector to the left tank. In an effort to restore engine power he pushed the power lever and used the manual over-ride but with no change. Assured that the engine had quit, he put the condition lever to cutoff, the starter switch on, and then the condition lever to "Hi-Idle" attempting to perform an airstart. At 1332:42, a flightcrew member of the airplane advised the HWO ATCT, "...just lost the engine"; however, the controller did not reply.

The PIC stated that he looked to his left and noticed a clear area on part of the turnpike, so he banked left, and in anticipation of the forced landing, placed the power lever to idle, the condition lever to cutoff, the fuel tank selector to off, and put the electrical gang bar down to secure the airplane's electrical system. He elected to retract the landing gear in an effort to shorten the landing distance. The right front seat occupant reported that the airplane was landed in a southerly direction in the northbound lanes of the Florida Turnpike. There were no ground injuries.

AIRCRAFT INFORMATION

The airplane was manufactured in 2008, by EADS Socata as model TBM 700, and was designated serial number 441. At the time of the accident, it was powered by a 850 horsepower Pratt & Whitney Canada PT6A-66D engine and equipped with a Hartzell HC-E4N-3/E9083 propeller with reverse capability.

The airplane's fuel system consists of a 150.5 gallon capacity wet wing fuel tank in each wing, with a resulting total usable capacity of 292 gallons. Fuel gauging is a capacitance type with 3 probes installed in each wing, and a low fuel sensor installed in each wing inboard of the inboard fuel probe, which provides a low level CAS messages when the fuel quantity remaining in the concerned tank is under about 9 U.S. gallons. The fuel probes are capacitors connected in parallel via electrical harness to the fuel amplifier (FCU) which in turn is connected electrically to the G1000 in the cockpit for display for the fuel tank readings.

Review of the maintenance records revealed an entry on August 4, 2010, indicating, "Troubleshoot right fuel quantity, found pin B at P61 connector loose, removed and replaced pin B at P61 connected as required, performed an operational check of right fuel quantity, system operates normal." The airplane total time at that time was recorded to be 451.1 hours. There was no other record of repair of the right fuel harness.

On September 29, 2011, the airplane was flown to HWO for compliance with an annual/600-

Hour inspection. A pre-inspection engine run-up was performed and according to a fuel timeline provided by the maintenance facility, the reading for the fuel level in the right fuel tank at the completion of the run was recorded by the G1000 to be 41 gallons. On October 4, 2011, due to fuel leaking from 2 panels of the right wing, it was drained of fuel. A total of about 70 gallons of fuel were drained from the right fuel tank. The same day, electrical power was applied for about 43 seconds and during this time the right fuel quantity at the beginning and ending of the power-up was recorded to be approximately 11 gallons, though there was no remaining fuel in the fuel tank. The leaking panels were removed, repaired, and reinstalled. On October 5th, the fuel drained from the right tank were placed back into the right wing, and a post maintenance run-up was performed using only fuel from the right fuel tank. This was done in an effort to balance the fuel load. The G1000 recorded that at the completion of the engine run, the right fuel tank contained 51 gallons. The G1000 indicated power application 2 days later indicating the right fuel tank had approximately 143 gallons, despite the fact that it had not been fueled. Five days later, on October 12, 2011, the G1000 indicated power application for less than 30 seconds which indicated the right fuel tank had 107 gallons of fuel, while the left fuel tank had 35.5 gallons of fuel. No maintenance was done to evaluate the reason for the changing right fuel quantity.

Further review of the maintenance records revealed that the airplane was last inspected in accordance with a 600 hour inspection and annual inspection which was signed off as being completed the day before. The airplane total time at that time was recorded to be 593.4, while the airplane total time at the time of the accident was 595.2 hours.

FLIGHT RECORDERS

The airplane was equipped with a Garmin G1000 Integrated Flight Deck, which is a collection of multiple avionics units which include flight displays. Each display has two SD card slots. The SD memory card was removed from the MFD and sent to the NTSB Vehicle Recorder Division for readout.

According to the NTSB Factual Report, the data was extracted normally and contained 59 log files. The event flight was recorded and contained approximately 1 hour and 38 minutes of data; the calculated sample time interval was 1.055 seconds per data record. A review of the recorded data with respect to the fuel level revealed that beginning about 1218, or about 2 minutes after takeoff until 1229, during which time the airplane was at FL190 and climbing to FL280, the fuel level indication for the left steadily decreased consistent with supplying fuel to the engine, while the fuel level indication for right varied with increases noted. The left fuel level remained steady from about 1229 until about 1245, indicative of fuel being provided from the right fuel tank. From about 1245 until about 1324, a steady decrease of the left fuel quantity was noted, while during the same period the right fuel quantity indication showed a general decline. At the end of the recorded data, the left fuel quantity was approximately 62 gallons, while the right fuel quantity was approximately 60 gallons. A copy of the report and data is contained in the NTSB public docket.

WRECKAGE AND IMPACT INFORMATION

The NTSB did not immediately respond to the accident site; however, the NTSB did view the airplane during the recovery process. The approximate location of where the airplane came to rest was reported to be 25 degrees 59.845 minutes North latitude and 080 degrees 13.312 minutes West longitude, or approximately 4,338 feet and 94 degrees from the approach end of

runway 27L (intended runway). The airplane was recovered for further examination. According to the recovery crew, fuel leakage was noted at the accident site; however, it was not determined what tank(s) the fuel leaked from, nor the amount of fuel leaked.

The airplane was formally inspected by NTSB on October 17 and 18, 2011. Also in attendance were representatives of the FAA, technical advisor from Daher-Socata, and Pratt & Whitney Canada. As first viewed, both wings and the horizontal stabilizer were removed. The fuselage was fractured circumferentially at frame 8.

Examination of the cockpit revealed the auxiliary fuel boost pump switch was in the "Auto" position, the manual fuel tank selector was in the "Off" position, and the fuel selector switch on the overhead panel was in the "Manual" position.

Testing of the airplane's fuel quantity indicating system was performed using the aircraft's battery for electrical power. The right wing which was empty of fuel was electrically connected while the wing was inverted. With the aircraft's battery power applied, the G1000 displayed red X's for fuel quantity for both sides. The G1000 indicated that the fuel used was 88 gallons, and the fuel remaining was 123 gallons. The left wing which was empty of fuel was then electrically connected in an upright position and with the aircraft's battery power applied, the G1000 displayed 108 gallons in the left wing on initial power up. The gallons decreased steadily over the next 10 minutes to 29 gallons when the test was terminated. The left and right wings were electrically connected in an upright position, and with aircraft's battery power applied, the G1000 displayed 33 gallons for the left fuel tank and the right fuel tank indicated red X's. With battery power applied and fuel selector switch on overhead panel in auto position, the G1000 displayed changing of the fuel selector position. The fuel sequencer was not in bypass; approximately 2 ounces of fuel were drained from the fuel sequence reservoir, which contained slight aluminum particles on the screen. With battery power applied, a fuel supply plumbed to the left wing root, and the fuel selector positioned to the left tank, fuel flow noted at the firewall fitting and no suction was noted at the right wing root fitting. With battery power applied, a fuel supply plumbed to the right wing root, and the fuel selector positioned to the right tank, fuel flow noted at the firewall fitting and no suction was noted at the left wing root fitting. The fuel amplifier was retained for further examination.

Examination of the left wing following fuel system testing revealed the fuel tank was breached, but there were no obstructions inside the fuel tank. The fuel tank outlet finger screen had a little fuzz material present. Both flapper valves were installed and noted to operate normally. The low fuel sensor, fuel probes, and electrical harnesses pertaining to fuel were noted to be installed correctly. The low fuel sensor, inner fuel probe, intermediate fuel probe, outer fuel probe, main fuel tank electrical harness, intermediate strap electrical harness, high and low fuel vent valves, and fuel check valve were removed for further examination.

Examination of the right wing following fuel system testing revealed the fuel tank was breached, but there were no obstructions inside the fuel tank. The fuel tank outlet finger screen had some debris. Both flapper valves were installed and operate normally. The low fuel sensor, fuel probes, and electrical harnesses pertaining to fuel were noted to be installed correctly. The low fuel sensor, inner fuel probe, intermediate fuel probe, outer fuel probe, main fuel tank electrical harness, intermediate strap electrical harness, high and low fuel vent valves, and fuel check valve were removed for further examination.

Cursory examination of the engine and propeller revealed all four propeller blades were bent

aft. Rotation of the propeller by hand resulted in expected rotation of the power turbine assembly, while rotation of the compressor assembly resulted in expected rotation of all the Accessory Gearbox (AGB) drives. Examination of the fuel filter revealed the level of residual fuel in the bowl measured 0.400 inch. The propeller was removed from the engine which was removed from the airframe and shipped to Pratt & Whitney Engine Services (PWES) facility for engine operational testing.

Prior to operational testing of the engine with FAA oversight, borescope examination of it revealed no discrepancies. The engine was placed in a test cell as received and with FAA oversight, the engine was started and operated at various power settings for over 2.5 hours. Four parameters exceeded the Overhaul Manual tolerances for a zero time engine, but when the repair limits that factor in the engine's operating time were used, the only parameter out of tolerance was the inter turbine temperature (ITT), which can be adjusted with a trim class change. A copy of the report from the engine manufacturer is contained in the NTSB public docket.

TEST AND RESEARCH

According to the maintenance manual, a low level test, and indicator calibration on aircraft are not due until 1,500 hours and/or 4 years; therefore, these special inspection items were not performed during the last 600-Hour/Annual inspection.

According to section 3.8 of the Pilot's Operating Handbook (POH), in the event of annunciation of "Fuel Low R" as reported by the pilot occurring twice, the emergency procedures specify to check the corresponding gauge, check that the other tank has been automatically selected, and if not, place the fuel selector switch to manual and manually select the opposite tank of the indication. Section 3.8 of the POH also indicates that with respect to the red warning CAS message "Fuel Press" on, a fuel pressure drop at the high pressure engine pump inlet. The corrective action indicates to check the remaining fuel, move the fuel selector to the opposite tank, check the fuel pressure indication, and place the "Aux BP" fuel switch to the auto position.

The POH also indicates that the fuel selector automatically changes in-flight every 10 minutes, and the maximum dissymmetry is 15 U.S. gallons. When the first low level CAS message occurs, the sequencer immediately selects the other tank. The selected tank will operate until the second low level CAS message occurs. When both low level CAS messages are visible, the sequencer changes tanks every 1 minute 15 seconds. There are no procedures specified in the POH to deal with multiple conflicting fuel level annunciations from the same fuel tank.

Testing of the 3 capacitance fuel probes from each wing, the low fuel sensor from each wing, the fuel amplifier (FCU), the fuel check valves from each wing, the left fuel gauge harness and intermediate strap, the right fuel gauge harness and right intermediate strap were performed at the respective manufacturer's facility with oversight from personnel of Bureau d'Enquetes et d'Analyses (BEA), Bourget, France. The results of the examinations revealed no evidence of preimpact failure or malfunction.

Examination of the right fuel gauge harness, part number (P/N) T700G921201000100, serial number (S/N) 0110740 was performed at the manufacturer's facility BEA oversight, who also performed X-ray testing of the harness. An electrical continuity check revealed a discrepancy of pin B of the P60 and P61 harnesses. During the testing resistance values of several thousand Ohms were noted; however, during movement of the harness, the resistance value increased to

more than 1 Million Ohms. Both harnesses were examined with an x-ray machine, the results of which were compared with the left harness, as well as to an exemplar harness. It was noted that the High Impedance shielded cable near the P60 connector appeared to be outside of the solder joint. The shielded wire on the P60 and P61 sides is a copper nickelled (kapton type) with a self-soldering sleeve adapted to this technology. A complete disassembly of the P60 harness was then performed which revealed that when the self-soldering sleeve was cut, the shielded HI wire was not correctly soldered to the shielding braid near the P60 connector during manufacturing; it was not complete. Testing of an exemplar harness duplicating the improper solder connection of the right harness was performed on an exemplar airplane with no fuel. During the testing, the right fuel quantity depicted the maximum value.

Personnel from the BEA reported that during research, starting with airplane serial number 434, new kapton type electrical wires were utilized for some of the fuel gauge harnesses. And although the manufacturing instructions were clear, one mistake was identified in the manufacturing process.

ADDITIONAL DATA/INFORMATION

Post-Accident Corrective Actions

As a result of the initial finding of the investigation and the result of a second airplane with erroneous fuel indication issue, in October 2011, a representative of the airplane manufacturer sent an e-mail to all owners, operators, and network owners of TBM 700 and TBM 850 (market name for TBM 700) airplanes equipped with Garmin G1000 Integrated Flight Deck. The e-mail advised of 2 instances in which erroneous fuel indication occurred. The e-mail asked that before the next flight, document the quantity of fuel in each tank, and then fill each tank noting the amount. If a discrepancy exists, contact a maintenance center to correct the discrepancy. The issue involving the other airplane was attributed to be from an intermediate fuel probe.

Additionally, in March 2013, the airplane manufacturer developed technical note (TN) 70-014, titled Fuel Gauge Harness. This made it mandatory to replace the shielded cable on TBM 700 airplanes equipped with modification (MOD) MOD70-0176-00, affected airplanes were S/N's 434 through 440, and 442 through 450. The airplane manufacturer also changed their quality control procedure for fuel gauge harnesses for production airplanes, and implemented a specific box used for manufacturing fuel gauge harnesses.

History of Flight

Approach-VFR pattern final	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-flare/touchdown	Hard landing Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Airline Transport	Age:	49
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without Waivers/Limitations	Last FAA Medical Exam:	04/11/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	02/01/2010
Flight Time:	11071 hours (Total, all aircraft), 4053 hours (Total, this make and model), 10415 hours (Pilot In Command, all aircraft), 102 hours (Last 90 days, all aircraft), 61 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Other Flight Crew Information

Certificate:	Commercial; Flight Engineer	Age:	50
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	10/28/2006
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2500 hours (Total, all aircraft), 5 hours (Total, this make and model), 2400 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	SOCATA	Registration:	N37SV
Model/Series:	TBM 700	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	441
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	10/12/2011, Annual	Certified Max Gross Wt.:	7400 lbs
Time Since Last Inspection:	2 Hours	Engines:	1 Turbo Prop
Airframe Total Time:	593 Hours as of last inspection	Engine Manufacturer:	P&W
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	PT6A-66D
Registered Owner:	SV LEASING COMPANY OF FLORIDA	Rated Power:	850 hp
Operator:	SOCATA North America, Inc.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	HWO, 8 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	1335 EDT	Direction from Accident Site:	283°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.85 inches Hg	Temperature/Dew Point:	30° C / 20° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hollywood, FL (HWO)	Type of Flight Plan Filed:	IFR
Destination:	Hollywood, FL (HWO)	Type of Clearance:	IFR
Departure Time:	1216 EDT	Type of Airspace:	Class D

Airport Information

Airport:	North Perry Airport (HWO)	Runway Surface Type:	Asphalt
Airport Elevation:	8 ft	Runway Surface Condition:	Dry
Runway Used:	27L	IFR Approach:	None
Runway Length/Width:	3255 ft / 100 ft	VFR Approach/Landing:	Full Stop; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	25.997222, -80.221944 (est)

Administrative Information

Investigator In Charge (IIC):	Timothy W Monville	Report Date:	04/10/2014
Additional Participating Persons:	Loftis Rollins; FAA/FSDO; Miramar, FL Xavier deGastines; Bureau d'Enquetes et d'Analyses (BEA) Philippe Santoro; Socata North America, Inc.; Pembroke Pines, FL Paul Crosby; Pratt & Whitney; Bridgeport, WV		
Publish Date:	04/10/2014		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=82046		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).