



National Transportation Safety Board Aviation Accident Final Report

Location:	LAUDERDALE LAKE, FL	Accident Number:	MIA99FA114
Date & Time:	03/25/1999, 1139 EST	Registration:	N5548A
Aircraft:	Grumman G-21A	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal, 1 Serious

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

The pilot was receiving a competency flight in the seaplane from an FAA inspector. The pilot was returning to their initial departure airport, descended to 1,000 feet, contacted the control tower for landing instructions, and was instructed to enter on a right base. Before he could acknowledge the landing instructions the engines started to make loud, rough, and unusual noises. The pilot informed the control tower that he was 2 miles south, declared an emergency, and stated he had a bad engine on the left side. The FAA inspector stated the pilot started the emergency procedure, the manifold pressure and rpm was fluctuating. The inspector could not determine the dead engine by the dead foot, dead engine method, because her rudder pedals were stowed. She pointed out a pasture and the pilot stated they were going to the water. She did not recall the pilot shutting down the engine or feathering the propeller. She could not recall the final seconds of the flight. The airplane collided with a tree, canal bank, and came to rest inverted in the canal. Examination of the airframe and flight control systems revealed no evidence of a precrash mechanical failure or malfunction. Examination of the left propeller revealed it was not feathered. The No. 6 front forward spark plug ignition lead was disconnected from the spark plug. The ignition lead shroud threaded coupling on the No. 4 front forward spark plug was unscrewed and the carbon wire was exposed. The left and right engines were removed from the airplane and transported to an authorized FAA approved repair station. The left engine was placed in an engine test cell. The engine was started, developed rated power, and achieved takeoff power. The spark plug lead was removed from the No.6 forward cylinder. The left magneto had a 125 rpm drop during the magneto check. The right magneto had a 75 rpm drop. The magneto drop exceeded the allowable drop indicated by the engine overhaul manual. The right engine was placed in a engine test cell. The engine was started, developed rated power, and achieved takeoff power. Review of the FAA inspectors FAA Form 4040.6 revealed she was not Event Based Current (EBC) for the 4th quarter of the Flight Standards EBC program, and she did not meet the EBC quarterly events required by the end of the 14-day grace period. FAA Order 4040.9 states for an FAA inspector to be eligible / assigned to perform flight certification job function they must be EBC current., and inspectors should not accept assignments without being in compliance with the FAA Order. Managers and supervisors should not assign inspectors who are not current. The FAA inspector's supervisor was aware that the inspector was not current. He contacted the FAA Safety

Regulation Branch, FAA Southern Region Headquarters, and stated that FAA Southern Region indicated that the inspector could administer the checkride. FAA Southern Region stated at no time did they approve or agree to an operation outside the parameters of the FAR's, Inspector Handbook or FAA Order.

Probable Cause and Findings

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

The pilots failure to correctly identify an in-flight emergency (fluctuating manifold pressure and rpm due to a disconnected spark plug lead / unscrewed ignition lead shroud) and failure to complete the engine shutdown procedure once it was initiated (propeller not feathered). This resulted in a forced landing and subsequent in-flight collision with a tree, dirt bank and canal. Contributing to the accident was the FAA inspectors improper supervision of the pilot, and the improper supervision of the inspector by her supervisor, in his failure to follow written procedures / directives in assigning a non-current inspector to conduct a competency flight.

Findings

Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: DESCENT

Findings

1. IGNITION SYSTEM, SPARK PLUG - DISCONNECTED
 2. (C) EMERGENCY PROCEDURE - IMPROPER - PILOT IN COMMAND
 3. IGNITION SYSTEM, SPARK PLUG - NOT SECURED
 4. EMERGENCY PROCEDURE - INITIATED - PILOT IN COMMAND
 5. ENGINE INSTRUMENTS, MANIFOLD PRESSURE GAGE - FLUCTUATING
 6. (C) EMERGENCY PROCEDURE - NOT COMPLIED WITH - PILOT IN COMMAND
 7. ENGINE INSTRUMENTS, PROPELLER RPM GAGE - FLUCTUATING
 8. (F) SUPERVISION - IMPROPER - FAA INSPECTOR
 9. (F) SUPERVISION - IMPROPER - FAA(OTHER/ORGANIZATION)
 10. PROCEDURES/DIRECTIVES - NOT COMPLIED WITH - FAA(OTHER/ORGANIZATION)
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Occurrence #2: FORCED LANDING

Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

11. OBJECT - TREE(S)
-

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

12. TERRAIN CONDITION - DIRT BANK/RISING EMBANKMENT
13. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT

On March 25, 1999, about 1139 eastern daylight time, a Grumman G-21A, N5548A, registered to Tropic Bird Holdings Inc., operating as a 14 CFR Part 135 competency flight, experienced a reported loss of left engine power, and crashed into a canal about 2 miles south of Fort Lauderdale Executive Airport (FXE), Fort Lauderdale, Florida. Visual meteorological conditions prevailed and no flight plan was filed. The airplane was destroyed. The airline transport pilot was fatally injured. The airline transport pilot FAA inspector sustained serious injuries. The flight originated from Watson Island International, Miami, Florida, about 10 minutes before the accident. The competency flight initially originated from FXE, at 0949.

Review of radio transcriptions between Fort Lauderdale Executive Air Traffic Control Tower (FXE) and N5548A, revealed that N5548A initially contacted the tower at 1136:33, with the ATIS information. At 1138:06, N5548A informed the tower that he was 3 miles south for landing. The controller asked N5548A to state type of airplane. N5548A replied, "standby sir standby." At 1138:36, N5548A replied, "five five four eight alpha we'd like to declare an emergency sir ah we're two miles south." The controller informed N5548A to enter right base runway eight, cleared him to land and asked the nature of the emergency at 1138:44. N5548A replied, "ok we have a bad engine on the left side sir." The controller cleared N5548A to land again and provided the winds. There was no other recorded communication with N5548A.

The FAA inspector stated in an initial interview with another FAA employee present, that shortly before the accident she heard a bad engine sound, and looked at the manifold pressure and rpm, which was fluctuating. She informed the pilot that there was a pasture. He stated he was going for the water. They went down like a rock turning towards the canal and crashed. When asked if she heard the pilot declare an emergency or shut down an engine she said no.

The FAA inspector stated in a subsequent written statement to the NTSB that the load manifest showed the ballast and fuel, and that they had about 4.5 hours of fuel at cruise flight, which meant they could stay airborne just under 4 hours, because they would be using full power frequently. The pilot showed her the fuel system. She stated, "I do not recall the setting or that he ever mentioned his intentions for handling fuel or if and when he changed the fuel selector." The pilot had a paper copy of the checklist. It was their intentions to record any required changes that may be required. A certified letter was sent to the FAA inspector on June 3, 1999, requesting clarification of her statement. She was asked in the letter if she reviewed the Pilot Operating Handbook (POH), (Model JRF-5 airplane) before conducting the competency flight, and were there any deficiencies noted with the POH? She was asked if the airplane was equipped with dual controls, and were all of the flight controls available to her during the flight? In addition, she was asked if there were any deficiencies noted during the preflight inspection, during propeller governor and magneto check?

In her response dated July 14, 1999, she stated, "Mr. O'Leary presented me with a copy of a manual, not a POH, which had been described by Mr. Santiago, when we met on March 24, 1999, to use for the oral. I used it that evening to additionally familiarize myself with the aircraft. I had four questions for him when I met him the next day, and he answered all of them." She further stated, "The airplane was equipped with dual controls. It is rated for one

pilot. The rudder pedals on the right side can be stowed. After the runup and check of the controls, I stowed them in the aft position. The pilot was aware of this because we had had a satisfactory discussion of what I would need to do should he become incapacitated or for any other reason I would need to take control of the aircraft. They were within reach to pull up into position for use." She also stated she did not recall any deficiencies during the preflight except for a minor correction to the load manifest, which was made, and there were no deficiencies with the propeller governor or magneto check.

They departed FXE, flew southbound, north of Turkey Point and set up for maneuvers conducting steep turns, stalls, and compass turns with the directional gyro and gyro horizon covered. They proceeded to Dolphin VOR and tracked inbound. Once established, they terminated the high work and positioned themselves for Government Cut, circling to wait access to the water. They landed and ramped the airplane at Chalk's seaplane base. They departed again, returned for a normal landing, steptaxied with turns, took off again, and power was reduced on one engine just past 500 feet. The pilot reacted quickly and power was restored. Abeam the probable touchdown point, power was reduced again on one engine. The pilot's procedures were good; however, the airplane was descending too fast and a go-around was commanded. The pilot returned for another landing without flaps, which resulted in another go-around. The appropriate checklist was completed and they headed to the Fort Lauderdale VOR.

They contacted Fort Lauderdale tower and were instructed to climb to 1,500 feet. They over flew the Fort Lauderdale-Hollywood International Airport. Once clear of their airspace, they descended to 1,000 feet, and called Fort Lauderdale Executive tower. The controller asked all aircraft to be silent and to listen to him for clearance. They made two shallow 360-degree turns while waiting for the controller to get back with them. The controller came back and stated that they were to make a right base to runway 08. Before the pilot could acknowledge, the engines started to make loud, rough, and unusual noises which could not be related to any particular problem. The pilot asked the tower for an emergency landing, which was approved by the controller. The pilot went through the first three or four steps of the emergency procedures. I looked at the rpm and manifold pressure, and the pilot stated the right engine was out. She informed the pilot, "I don't know, Paddy," and observed the needles on both engines and gauges fluctuating. She further stated, "my rudder pedals were stowed, so I could not determine the dead engine by the dead foot, dead engine method." She pointed out a pasture and the pilot stated they had to go to the water, and continued to work with both engines, but the noise never decreased. She did not recall the pilot shutting down either engine or feathering a prop, and said, "we seemed to be, not in a glide, but sinking like a rock after the effect of going over the top of a roller coaster." She did not recall the last few hundred feet or the collision with the trees.

Witnesses stated they saw the airplane flying towards the north at a very low altitude, descending. The engines were making a loud popping sound. The airplane started a shallow turn estimated less than 45 degrees. The airplane collided with a tree and crashed into the canal.

PERSONNEL INFORMATION

The 40-year-old deceased pilot held an airline transport pilot certificate, with ratings for airplane multiengine land, and multiengine sea. In addition, he held a private pilot certificate with a rating for airplane single-engine land. He indicated on an application for a first class

medical certificate dated December 14, 1998, that he had accumulated 10,000 hours, with 400 hours flown in the last 6 months. Attempts to locate the pilot's logbook were unsuccessful. A certified letter was mailed to the wife of the deceased pilot on April 28, 1999, requesting a copy of the pilot's logbook. The letter was returned to the NTSB by the U.S. Postal Service, on May 6, 1999.

Review of a pilot history form submitted to Aviation Insurance Management Inc., on March 17, 1999, revealed the pilot had accumulated 11,711.5 total hours, of which 520 were recorded as logged in the Grumman Goose G-21A, and 20 hours were flown in the last 90 days.

The 57-year-old FAA inspector holds an airline transport pilot certificate, with ratings for airplane single-engine land/sea, multiengine land/sea, flight instructor, airplane single and multiengine, and instrument airplane. In addition, she holds a ground instructor and flight engineer certificate. She indicated on an application for a second class medical certificate dated August 19, 1998, that she had accumulated 7,521 hours, with 71 hours flown in the last 6 months. Review of FAA Form 4040-6 revealed the pilot had not recorded any hours in the Grumman Goose G-21A before the accident. She was requalified in the Grumman Mallard GA-73T on February 24, 1998. Her last seaplane proficiency flight was conducted in a GA-73T on August 18, 1998. Review of the FAA inspectors FAA Form 4040.6, FAA Aircraft Request and Use Record, dated August 18, 19998, revealed she had only recorded six day takeoff and landings during the 4th quarter of the Flight Standards Event Based Currency program (EBC), and she did not meet the quarterly events required by the end of the 14-day grace period. An LOA was issued by FAA ASW-203, on March 3, 1999, authorizing her to conduct checkrides in a G-73T aircraft. She was prohibited from occupying a required flight crewmember seat while performing duties under the authority of the LOA. According to a cc: mail sent to the FAA inspector on March 12, 1999, from her white team leader, she was authorized by the FAA Regional Office to conduct the 14 CFR Part 135.293 check to Tropic Bird Airways. The pilot did not recall if she was or was not EBC current at the time of the accident.

The FAA inspector's supervisor stated in a statement dated September 7, 1999, he reviewed the national inspector pilot resource web site to see if any other inspectors were available who met the EBC currency requirements for twin-engine seaplanes, and none were located. Although the inspector assigned was not seaplane events current, she was airplane current, having completed all general aircraft events.

"FAA Bulletins HBAT 93-02/HBGA 93-01 address (among other things) what to do in the event an appropriately rated and EBC current inspector is not available to conduct a given practical test. On such occasions, a LOA can be issued to allow an inspector to administer the check, if that inspector is deemed best qualified in an aircraft with similar characteristics. Because inspector Hirsch holds both Airline Transport Pilot (ATP) Multi-Engine Seaplane and Grumman G-73T type ratings, I felt she was best qualified to administer the checkride....I could not find no written guidance that addressed how to obtain a similar dispensation from the EBC requirements for checkrides administered in small aircraft."

"It did not seem rational to me that the FAA intended to allow dispensations from the EBC requirements for checkrides administered in large aircraft, but not for small aircraft, so I called Mr. Emmet Hughes (ASO-250), the Air Safety Regulations Branch EBC Programs Specialist. We discussed all of the above matters. He agreed that an LOA was not appropriate and that it appeared inspector Hirsch could administer the checkride for Paradise Flights, Inc.

I was trained to use my best judgement when confronted with situations not addressed in our Handbooks and Bulletins. Because the pertinent FAA Orders and Bulletins were silent as to the mechanism by which dispensation from the EBC requirements could be obtained for administering a checkride in small aircraft (under 12,500 lbs.). I opted to exercise my best judgement in determining the proper course of action.... I authorized her to conduct that check. I stand by that decision, and believe it was not inconsistent with FAA policy."

A statement submitted by an FAA Aviation Safety Inspector assigned to the ASO-250, Air Safety Regulations Branch, FAA Southern Region Headquarters, College Station, Georgia, revealed that the FAA inspector's supervisor contacted ASO-250 on or about March 11, 1999, regarding the proposed G-21A aircraft Part 135 flight check. "The main items of discussion were, requirements for an Letter of Authorization (LOA), inspector qualification for job functions as a pilot, and EBC requirements for inspector currency to fly or conduct job functions as a pilot. The discussion revealed that a G-21A is certified below 12,500 Lb.'s gross take-off weight and, therefore, does not require an LOA to conduct a flight check when the inspector has not flown that particular aircraft. Further, that an LOA previously used to conduct a flight check in a G-73 aircraft had no bearing on the planned FAR 135 flight check even if it had been required in a G-21A. The discussion then hinged on the requirements of the General Aviation Inspectors Handbook, 8700.1, and FAA Order 4040.9, Aircraft Management Program. The items talked about were requirements for:

- * 24-month formal course, or equivalent, attendance by operations inspectors who conduct cockpit job functions.
- * 12-month flight competency checks for operations inspectors who conduct cockpit job functions.
- * EBC currency in aircraft category and class of aircraft flown while performing inspector job functions.

"The telephone call was concluded on the basis that the proper references to determine inspector qualifications were discussed, and that if the inspector met those requirements, then the flight check could be conducted. At no, time did the Southern regional Office approve or agree to an operation outside the parameters of the FAR's, Inspector Handbook or FAA Order."

Review of FAA Order 4040.9D, Appendix 11. FLIGHT STANDARDS EVENT BASED CURRENCY PROGRAM SECTION 1. GENERAL, SECTION 3. QUARTERLY EVENTS FOR GROUP 1 INSPECTORS and, SECTION 5. DOCUMENTATION, states:

"1. PURPOSE. This appendix prescribes the Flight Standards Event Based Currency (EBC) Program for Flight Standards Aviation Safety Inspectors....

3. DEFINITIONS....

f. Group 1 Pilot. An Aviation Safety Inspector-Operations who is assigned to perform one or more of the following job functions:

- (1) Conduct pilot certification activities while occupying a pilot duty station....

11. LOCAL FLIGHT PROGRAM MANAGEMENT

c. Currency Required to Perform Flight Certification Job Functions. Inspectors are qualified to perform flight certification job functions only after complying with this appendix. Managers and supervisors shall not assign and inspectors will not accept assignments involving flight certification job function responsibilities without compliance with the requirements of this appendix....

14. ELIGIBILITY TO CONDUCT AIRMAN CERTIFICATION JOB FUNCTIONS. For an

inspector to be eligible / assigned to perform flight certification job functions, he must meet the following criteria:...

(c) Completion of Quarterly Events Program per this appendix....Events / tasks will be completed by inspectors on a quarterly basis.

(1) Grace period. If tasks have not been completed by the end of the Quarter, the inspector will be allowed 14 additional calendar days to complete them....Inspectors failing to complete the quarterly events by the end of the grace period, however, will need to meet re-qualification provisions of the next paragraph.

(2) Re-qualification provisions. An inspector who fails to meet the events / task requirements set forth by paragraph c above, shall be required to complete one quarter's event / tasks and a requalification check prior to being reassigned flight certification job functions. This provision applies to inspectors who become non-current under this appendix for any reason.

20. CATEGORY, TYPE AND CLASS OF AIRCRAFT. Each category, type and class of aircraft listed here will require training and currency events to be performed:...

Airplane-Multi-Engine Sea

21. GROUP 1 INSPECTOR TASKS. Each group one inspector will perform the quarterly tasks as follows:

a. General Tasks. Tasks found in paragraphs titled "General" apply to inspectors assigned flight certification job functions in that category of aircraft (Example: All inspectors assigned to airplanes must complete paragraph 22. All inspectors assigned to Rotorcraft must complete paragraph 28).

22. GENERAL AIRPLANE TASKS. All Inspectors assigned flight certification job functions in airplanes will perform the tasks listed below during each calendar quarter:...

b. Fifteen takeoffs. (1) Four Instrument (2) Four Crosswind (3) Three night (when night job functions are preformed) (4) Four more. One rejected, or with a simulated power plant failure.

63. CURRENCY IS QUARTER BY QUARTER.

a. The program is based on standard calendar quarters (Oct-Dec; Jan-Mar; Apr-Jun; Jul-Sep)....

c. Completion of events on any date within a quarter counts for currency (provided medical, proficiency, training are current) through the last day of the next quarter."

AIRCRAFT INFORMATION

Information pertaining to N5548A is contained in this report on page 2 Aircraft Information, NTSB Form 6120.4.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. For additional information see page 3 of this report.

WRECKAGE AND IMPACT INFORMATION

The wreckage of N5548A was located about 2 miles south of Fort Lauderdale Executive Airport, 710 feet west of NW 31st Avenue in the C-13 canal, located north of the Carefree Cove mobile home park in Lauderdale Lakes, Florida.

Examination of the crash site revealed the airplane collided with the top of a 40- to 50-foot-tall tree in a descending right turn. The airplane continued forward and the right wing tip collided with the south bank of the C-13 canal. The airplane rotated around its vertical axis to the left. The left wing separated at station 166. The airplane came to rest inverted on a heading of 176 degrees. The left float separated from the left wing at station 226. The left and right main landing gear, tail wheel, and flaps were in the up position. A post-crash fire originated below the water line between station 10 extending rearward to the false step at station 16 in the vicinity of the bilge pumps. Examination revealed the left main fuel tank valve separated from the sump tank. Fuel escaped from the sump tank. The bilge pumps were found in the auto position with the green advisory light illuminated.

The pilot's compartment separated at station 12 behind the pilot and copilot seat, along with the center wing section, and fuselage from station 16 to station 36 during recovery. The left and right engine remained attached to the center wing section. The left and right fuel tanks were not ruptured. Canal water and an undetermined amount of aviation fuel was removed from the left and right fuel tanks. The left and right propellers were not feathered. The right wing tip was bent upward at station 271.

The throttle, mixture, and propeller controls were attached to the overhead instrument panel. The left throttle was in the idle position. The left propeller was full forward and the mixture was full rich. The left engine fuel cut-off valve located on bulkhead behind the pilot's seat was in the off position. The right throttle was in the full forward position. The right propeller was full forward and the mixture was full rich. The right engine cut-off valve was in the on position. The pilot's rudder control pedals were in the extended position. The copilot's rudder control pedals were found in the stowed position.

Examination of the airframe and flight control assembly revealed no evidence of a precrash mechanical failure or malfunction. Continuity of the flight control assembly was confirmed for pitch, roll, and yaw.

Visual examination of the left propeller revealed the propeller was attached to the propeller spline shaft. No evidence of torsional twisting, "s" bending, chordwise scarring or leading edge damage was present. There was no evidence of rotation present on the propeller spinner. The start locks were not damaged and attached to the spinner bulkhead. The propellers were transported to Aviation Propellers Inc., an authorized FAA repair station for further analysis. A bench test was conducted on the left propeller governor with the Hartzell Governor Maintenance Manual. The pressure relief valve pressure was 160 psi with 4 quarts of oil per minute. The relief valve pressure should be 290-310 psi with 8-12 quarts of oil per minute. The plug relief valve was removed to gain access to the relief valve and relief valve spring. The inside diameter of the pressure relief valve exhibited rippled wear marks. The maintenance manual requires usage of a A-3194 pressure relief valve spring. The A3194 spring was not installed. The governor was reassembled and forwarded to the FAA Manufacturing Inspection District Office for further examination. A bench test was conducted and the pressure relief valve pressure was 280 psi with 8.2 quarts of oil per minute. Disassembly of the propeller governor by Hartzell in the presence of the FAA revealed the inside diameter of the pressure relief valve had rippled wear marks caused by contact from the pressure relief valve

spring. Teardown examination of the left propeller revealed very little damage. Slight markings on the link arms from counterweight contact indicates a very low blade angle, in the proximity of the low pitch stop. The start lock plate on the bottom of each blade clamp was not damaged. Hartzell staff concluded that the propeller was rotating at impact and was not feathered. There were no propeller discrepancies noted that would have precluded normal operation or feathering of the left propeller. For additional information see the Hartzell Propeller Teardown and Propeller Governor Report.

Visual examination of the left engine revealed the No. 6 front forward spark plug ignition lead was disconnected from the spark plug. The ignition lead shroud threaded coupling on the No. 4 front forward spark plug was unscrewed and the carbon wire was exposed. Pratt and Whitney (P&W) Service Bulletin No. 1274 rework of sparkplug lead conduits had not been completed. A cc: mail received from an FAA inspector stated (see attached cc: mail), while in industry he experienced a problem pertaining to the P&W 985 engine ignition. Moisture was getting into the harness, while operating in high moisture conditions and rain. The difficulties were ignition leads breaking down and firing to the ignition harness shielding and to the ground. This of course would create a violent misfire, backfire or afterfire and a rough engine with loss of power and erratic instrument tachometer and manifold pressure readings. No fuel was found in the carburetor inlet screen. Fuel was present from the firewall to the engine-driven fuel pump and from the engine-driven fuel pump to the carburetor.

The left engine was transported to Dumont Aircraft Engines Inc., an authorized FAA approved repair station. The left and right magnetos were removed and a functional bench test was conducted in accordance with Technical Order 8E2-5-3-23. The bench test revealed a dead left magneto. The right magneto functioned. An ohmmeter reading was taken on the left magneto coil. The resistance was 5.1k ohms. The resistance should be between 3.9k ohms to 6.0k ohms. The coil was removed, a serviceable coil was installed, and a functional bench test was performed with no deficiencies noted. The left and right magnetos were reinstalled on the left engine. The engine was placed in an engine test cell. The engine developed rated power and achieved takeoff power. Gravity fuel pressure was recorded at 2 psi. Removal of the engine-driven fuel pump after the engine run revealed the drive shaft had separated during the engine run. The spark plug lead was removed from the No. 6 front forward cylinder. The left magneto had a 125 rpm drop during the magneto check. The right magneto had a 75 rpm drop during the magneto check. The magneto drop exceeded the allowable drop indicated by Pratt & Whitney Overhaul Manual Part No. 123440, page 227-228, Final Engine Check. The manifold takeoff power was reached before obtaining takeoff power. The left magneto was taken off line along with the No. 6 front forward spark plug lead. A significant degradation of engine power and performance was noted. For additional information see engine the test run sheet.

Visual examination of the right propeller revealed the propeller was attached to the propeller spline shaft. Rotational scarring was present on the camber side of blade Nos. 2 and 3. The outer 1/3 of blade No. 2 is bent aft. There was no evidence of rotation present on the propeller spinner. The start locks were not damaged and attached to the spinner bulkhead. The propeller was transported to Aviation Propellers Inc., an authorized FAA repair station for further analysis. A bench test was conducted on the right propeller governor with the Hartzell Governor Manual. No deficiencies were noted. Teardown examination of the right propeller revealed it had mild impact damage and impacted at low speed and low power. The start lock plate on the bottom of each blade clamp was not damaged. There were no discrepancies noted

that would have precluded normal operation or feathering of the right propeller. For additional information see the Hartzell Propeller Teardown report.

Examination of the right engine revealed no fuel was present in the carburetor inlet screen. The B-nut from the engine-driven fuel pump to the carburetor inlet screen was loose, and fuel was present in the line. Fuel was present in the fuel line from the firewall to the engine-driven fuel pump.

The right engine was transported to Dumont Aircraft Engines Inc., an FAA approved repair station. The left and right magnetos were removed and a functional bench test was conducted in accordance with Technical Order 8E2-5-3-23. The bench test revealed a dead left and right magneto. An ohmmeter reading was taken on the left magneto coil. The resistance was 2.2k ohms. The coil was removed, a serviceable coil was installed, and a functional bench test was performed with no deficiencies noted. An ohmmeter reading was taken on the right magneto coil. The resistance was 4.4k ohms. The coil was removed, a serviceable coil was installed, and a functional bench test was performed with no deficiencies noted. The resistance on both magnetos should be 3.9k ohms to 6.0k ohms. The left and right magneto were reinstalled on the right engine. The engine was placed in a test cell. The engine developed rated power and achieved takeoff power. For additional information see the engine test run sheet.

The left and right magnetos were removed from both engines for further testing of the coils. The magnetos were transported to an FAA approved repair station. The magneto coils were removed from the magnetos of both engines and placed in an oven. The coils were baked for 1 hour at 200 degrees Fahrenheit to remove canal water that may have been trapped in the coil. A bench test was performed on all magnetos, and all magnetos were dead. An ohmmeter reading was taken on the left engine, left and right magneto coils. The left magneto coil resistance was 5.1k ohms. The right magneto coil resistance was 3.92k ohms. The coils on both magnetos were partially disassembled. The left engine, left magneto laminated core coil wire was attached to the secondary coil post. No visible breaks were present in the coil wire. The point gap was .0035. The right magneto had corrosion present on the primary terminal. The laminated core coil wire was attached to the secondary coil post. No visible breaks were present in the coil wire. The point gap was .0035. An ohmmeter reading was taken on the right engine, left and right magneto coils. The left magneto coil resistance was 4.3k ohms. The right magneto coil resistance was .721k ohms. The coils on both magnetos were partially disassembled. The right engine, left magneto secondary post was loose, and the laminated core coil wire was attached to the secondary post. No visible breaks were present in the coil wire. The point gap was .0035. The right magneto laminated core coil wire was separated 3/4 inch outboard of the secondary coil post. No other visible breaks were present in the coil wire. The point gap was .004.

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examination of the pilot was conducted by Dr. Lance G. Davis, Associate Medical Examiner, Medical Examiners Office, District 17, Fort Lauderdale, Florida. The cause of death was drowning. Postmortem toxicology of specimens from the pilot was forwarded by the Broward Medical Examiners Office to the Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma, by FedEx on March 26, 1999, on Airbill No. 807032035095. The shipment did not arrive at Oklahoma City, Oklahoma. Local testing of toxicology specimens from the pilot was performed by the Office of the Medical Examiner, District 17, Fort Lauderdale, Florida. The specimens were negative for drugs and ethanol, and

positive for carbon monoxide 5 percent.

The FAA observer was transported to Broward General Medical Center, Fort Lauderdale, Florida, with serious injuries. Toxicology of blood specimens from the FAA observer was forwarded to the Office of the Broward Medical Examiner, District 17, Fort Lauderdale, Florida. The specimen was negative for drugs and ethanol. TEST AND RESEARCH

A cassette tape of the radio transmissions between Fort Lauderdale Executive Air Traffic Control tower, Local Control position and N5548A was forwarded to the NTSB Office of Research and Engineering, Washington, D.C., for a Specialist's Sound Spectrum Study. The recording was examined to document any engine or propeller sounds that could be heard during radio transmissions from the accident airplane. The study was unable to determine if one or both engines were operating at the time of the accident. For additional information see, Air Traffic Control Recording Sound Spectrum Study.

Review of refueling records on file with Banyan Air Service, Fort Lauderdale Executive Airport, revealed that N5548A received 65 gallons of 100 low-lead fuel on March 24, 1999, from truck number A-5. A fuel sample was taken and examined by PANAIR Laboratory, Inc., Miami, Florida. PANAIR concluded, "the test results for color, distillation and lead are typical and normal for avgas grade 100LL." For additional information see the PANAIR Laboratory, Inc., Gasoline Analysis Report.

Title 14 CFR Part 61.45 PRACTICAL TESTS:REQUIRED AIRCRAFT AND EQUIPMENT (c) states, "Required controls. An aircraft (other than a lighter-than-air aircraft) used for a practical test must have engine controls and flight controls that are easily reached and operable in a conventional manner by both pilots, unless the examiner determines that the practical test can be conducted safely in the aircraft without the controls being easily reached." The FAA observer's rudder control pedals were found in the stowed position.

Review of FAA Orders 8400.10, Air Transportation Operator's Inspector's Handbook, paragraph 545. CONDUCT OF PROFICIENCY AND COMPETENCY CHECKS states, "Specific direction and guidance for the conduct of certification flight tests is in volume 5, chapters 1, 2, and 3. The same standards and direction and guidance are applicable to both inspectors and check airmen when conducting proficiency checks, VFR competency checks, and IFR competency checks.

Title 14 CFR Part 135.293 INITIAL AND RECURRENT PILOT TESTING REQUIREMENTS (a), (1), and (2) states:

"(a) No certificate holder may use a pilot, nor may any person serve as pilot, unless, since the beginning of the 12th calendar month before that service, the pilot has passed a written oral test, given by the Administrator or an authorized check pilot, on that pilot's knowledge in the following areas-

(1) The appropriate provisions of Parts 61, 91, and 135 of this chapter and the operations specifications and the manual of the certificate holder.

(2) For each type of aircraft to be flown by the pilot, the aircraft powerplant, major components and systems, major appliances, performance and operating limitations, standard and emergency operating procedures, and the contents of the approved Aircraft Flight Manual or equivalent, as applicable;"

Review of documents and statements obtained from San Juan Flight Standards District Office FSDO-21, Principal Operations Inspector (POI), and Principal Maintenance Inspector (POM), revealed FSDO-21 is the certificate holder for Paradise Flights, Inc. The deceased pilot, an applicant for the chief pilot position with Paradise Flights, Inc., and future president of Tropic Bird Airways Inc., visited FSDO-21 on December 11, 1998, to discuss the status of the certificate, and his intentions for change of future ownership. In addition, he was looking at the option of downgrading the certificate to a single pilot operation, add a seaplane to the certificate, and eventually transfer the certificate to Fort Lauderdale Flight Standards District Office (FSDO-17). A letter was written by the POI to Mr. James Delsalvo, Paradise Flight Inc, on December 11, 1998, informing him of the meeting with Mr. Padraic G. O'Leary. The POI stated in the letter, that since the certificate had been inactive for over 90 days, the FAA would like to conduct a full inspection re-examination as per FAR 119.63 (a) (b). In addition, in order to amend Paradise Flight, Inc., Operations Specifications to reflect the change of ownership, and amend its air carrier certificate that the following documentation is needed:

* A copy of the Purchase Agreement. * Proof of Insurance. * Copy of current Aircraft Registration and Airworthiness Certificate. * DOT OST Form 4507. (Proof of Insurance) * If a DBA is taking place, a letter requesting this information be added to Part A of your Operations Specifications. * A letter stating your intentions, Management Personnel names and positions, Principal Base of Operations address, mailing address and telephone number, Agent for Service name, address and telephone number, location of training facilities, who is going to sign the Operations specifications and the name of the person exercising operational control. * Date for our office to conduct the conformity inspection of your aircraft and the FAR 135 pilot proficiency check. * Changes to your Operations Manual, Training Manual, Maintenance Manual, Letter of Compliance, Hazardous Materials Operations/Training Program and MEL as applicable to your operations in order to show currency. * Drug/Alcohol testing Program.

On January 8, 1999, the POI, FSDO-21, sent a cc: mail to the Manager, FSDO-17, requesting their assistance in conducting a FAR 135, pilot-in-command, VFR pilot checkride, and aircraft conformity inspection for Paradise Flights, Inc., doing business as Tropic Bird Airways, Inc. Tropic Bird had the intentions of transferring the certificate to FSDO-17 in the near future. The Director of Maintenance, for Tropic Bird, sent a letter to FSDO-21, on January 28, 1999, with an information copy to FSDO-17, stating that N5548A was ready for certification and compliance. In addition, he stated all work and manuals are complete and ready for conformity checks, and that their personnel would be available on February 4, 1999. FSDO-21 POI, received a G-21A Grumman Goose Checklist from Tropic Bird on February 18, 1999. An airplane flight manual was not submitted with the checklist, and the checklist only included emergency procedures for engine fire and engine failure. The president of Tropic Bird stated in a letter that he had sent changes to the Minimum Equipment List (MEL), and that FSDO-17 had scheduled the conformity check for February 18, 1999.

Review of training records for the FSDO-17 avionics inspector assigned to conduct a part of the conformity inspection on N5548A revealed that he was not signed off to conduct the certification inspections in accordance with job task analysis 1.3.20, certificate a FAR 135 single pilot operator, or job task analysis 1.3.21, certificate a FAR 135 air taxi with (9 or less aircraft). The records indicate he completed level one training in both tasks on September 14, 1995. The avionics inspector stated he used FAA Order 8300.10, Volume 2, Chapter 68, 92, Volume 3, Chapter 3, and a ramp inspection job aid part 121/125/135 airworthiness job card to conduct the ramp inspection. He was tasked by his supervisor to conduct a conformity inspection since

an airworthiness certificate had previously been issued. He conducted a visual inspection, which consisted of an interior and exterior inspection of the airplane. In addition, he reviewed air worthiness directives (AD), pulled the type certificate data sheet for airframe and engines in order to determine serial number affectivity for applicable ADs supplemental type certificate (STC), and reviewed all FAA Form 337s that were applicable to the airplane. He further stated he did not recall reviewing the Pilot Operating Handbook (POH) because there were no alterations noted in the records pertaining to avionics that would require his review of the POH. He stated he observed an FAA Form 337 on the propellers, and checked the STC cover page to the STC. He could not recall whether or not he verified the placard information pertaining to the STC cover page. Once the inspection was completed, he contacted the FSDO-21 PMI and informed him of the inspection results. Review of FSDO-17 Program Tracking and Reporting Subsystem (PTRS) records revealed he conducted a ramp inspection (activity code 5627) on February 18, 1999. He entered in the Comment Text: "Performed ramp inspection at the request of San Juan PMI. No discrepancies noted at the time of inspection. Pilot and Director of Maintenance queried as to dry chemical fire extinguishers and life vests found aboard aircraft. Life vests were new and within factory stipulated inspection intervals with first inspection due 1/2001. Dry chemical fire extinguishers were acceptable with no guidance located that prevented or expressly forbade their use as emergency equipment. Advised PMI by telephone of inspection results."

Review of training records for the FSDO-17 POM assigned to conduct a part of the conformity inspection revealed he was qualified in all tasks. He was assigned to conduct the conformity inspection by his supervisor, but elected to conduct a ramp inspection because the written guidance in FAA Order 8300.10 is very vague. He stated he used FAA Order 8300.10, ATP disk, Dyna Com, Summit Aviation, and a ramp inspection job aid to conduct the inspection. When asked by the NTSB IIC if he reviewed Advisory Circular 120-49 or FAA Order 8130.2C before conducting the inspection, he stated, he is not sure if he looked at either document. He further stated he did not request any information from Tropic Bird or speak to anyone from Tropic Bird before they went to conduct the inspection. He conducted a visual inspection, from the bottom of the airplane to include exterior and interior components. Before examining the airplane he stated he reviewed the airframe, powerplant, propeller logbooks and FAA Form 337s, but he could not remember what 337s he looked at, since there was allot of paperwork involved with the inspection. He pulled the type certificate data sheet and ADs, but he could not remember if he pulled the STCs. In addition, he could not remember what type of inspection program that the airplane was on, nor could he recall seeing a POH. He stated, he saw the placards on the airplane but he could not say whether or not they were correct. He also stated the avionics inspector conducting the inspection with him, called the FSDO-21 POM and informed him of the inspection results. Review of FSDO-17, PTRS data confirmed that he conducted a ramp inspection (activity code 3627) on February 18, 1999. He entered in the Comment Text: "Performed ramp inspection at the request of San Juan PMI. No discrepancies noted at the time of inspection. Pilot and Director of Maintenance queried as to dry chemical fire extinguishers and life vests found aboard aircraft. Life vests were new and within factory stipulated inspections intervals with first inspection due at 1/2001. Dry chemical fire extinguishers were acceptable with no guidance located that prevented or expressly forbade their use as emergency equipment. Advised PMI by telephone of inspection results."

Both FSDO-17 maintenance inspectors were asked who is responsible for the parameters listed in FAR 91.9 which states, no person may operate a civil aircraft without

complying with the operating limitations specified in the approved airplane or rotorcraft flight manual, markings, and placards, or as otherwise prescribed? They both stated it was a shared responsibility with the operator and the FAA inspector.

The supervisor for both FAA maintenance inspector's stated that although the avionics inspector had not completed all elements of his OJT training program, he was fully qualified to perform the functions for which he had been assigned. In addition, the PTRS code used by the PMI did not apply to the requested inspection. N5548A had a valid airworthiness certificate and a current annual inspection at the time the airplane was presented for the conformity inspection. The inspectors recorded both a ramp and records inspection in the PTRS system. "While the summaries indicate the inspectors performed a "ramp" inspection, rather than a "conformity" inspection, this misstatement is probably attributable to the fact that there is no PTRS code for the conformity check they were conducting and they were looking for PTRS codes that would provide the best fit for the conformity inspection they were conducting."

Review of FAA Orders/Handbook 8300.10.02-68, Volume 2, Chapter 68 Evaluate FAR Part 135 (9 or less) Operator, states in Section 2 Procedures, 5 Procedures, H. Observe Demonstrations and Conduct Inspections, (1) Ensure that the following are acceptable: Aircraft (conformity, maintenance records, etc.) There are no written standards listing areas of concern (checklist) for an FAA Maintenance Inspector to conduct a conformity inspection.

Tropic Bird submitted a copy of the Pilots Handbook, Model JRF-5 Airplane, to FSDO-21 on March 4, 1999. The JRF-5 manual did not include any emergency procedures. The president of Tropic Bird called the POI for FSDO-21 on March 10, 1999. The POI informed him that the Pilots handbook (JRF-5) that was submitted did not contain sufficient information, and that a manual with checklist and emergency procedures would be required. He also informed him that the MEL was being returned for corrections. The president was upset since the manual had been accepted during the conformity inspection conducted by FSDO-17, and stated that he would send an Antilles Air Boat manual that would be helpful. An Airframe and Powerplant mechanic with Sturges Aircraft, Inc., stated the deceased pilot had developed the Pilots Operating Handbook for Tropic Bird, from manuals that he had borrowed about 2 years before the accident. The deceased pilot asked him if he could borrow the manuals in March 1999, before the accident in order to supply the FAA with some additional information. He provided the pilot with the Gulfstream American Airplane Flight Manual for Grumman Goose Model G-21A, Pilot's Manual for G-21A Goose Pratt & Whitney R-985-AN-14B Engines, and Pilot's Handbook of Flight Operating Instructions Navy Model JRF-5 Airplane.

The president submitted an updated Flight Manual (Pilot's Manual for G-21A Goose Pratt & Whitney R-985-AN-14B Engines) on March 10, 1999. The manual was received by FSDO-21 on March 11, 1999. FSDO-21 requested additional emergency checklist information to add to the checklist previously submitted on February 18, 1999. Tropic Bird provided FSDO-21 with an updated checklist which was received on March 15, 1999. The president was notified on March 15, 1999, that the normal and emergency checklist procedures had been accepted. In addition, he was informed the only item that needed to be corrected, is not to obtain VMC in an engine failure situation after takeoff but, "to obtain the single engine best rate or angle of climb as applicable to the circumstances". Mr. Santiago, FSDO-21 stated, either Mary Hirsch, or Mr. O'Leary informed him that the 135 checkride had been scheduled with Mary Hirsch, on March 24 or 25, 1999. The check pilot sent a cc mail to the POI on March 16, 1999, wanting to know if there was anything in particular that the POI wanted

covered during the certification. In addition, the check pilot stated she had spoken with the inspectors that had conducted the conformity check, and they had no concerns. The POI for FSDO-21 informed the check pilot in a cc mail on March 17, 1999, that he had accepted the checklist. He further stated that the Pilot's Manual for the G-21A Goose, was the only guidance that he could use to accept the checklist. He also requested that the check pilot provide some input and recommendations to improve the checklist. No checklist was found in the aircraft wreckage.

Review of the Pilot's Handbook Model JRF-5 Airplane that was found in the aircraft wreckage revealed the manual had not been updated to the standards or alterations that had been performed on the airplane. The manual referenced the wrong engines, carburetors, and propellers, referred to an autopilot that was not installed, and referenced a handcranked landing gear when an electrical landing gear system was installed. In addition, no emergency procedures were included and it listed numerous items that were not installed in the airplane such as pistol and ammunition, float lights, smoke grenades, parachute flares, and bomb controls.

Review of Type Certificate Data Sheet 654 revealed the only approved propellers for the Grumman G-21A are item 109. Two controllable metal (Hamilton Standard hubs 2D30, blades 6095A-12) 303 lbs. (-52), item 228. Two constant speed full feathering hydromatic (Grumman Drawings 13709 and 13710) (Hamilton Standard hubs 22D30, blades 6181A-12, 6183A-18, or 6381A-12) .67 lbs. (-38), ITEM302. Two controllable metal (Hamilton Standard hubs 2D30, blades 6167A-12 or 6101A-18) (for interchangeable blade models see Prop Spec.206)

Review of the airplane logbooks and FAA Form 337 revealed Hartzell Propeller hub model HC-B3R30-2E with blade P10152-51/2 were installed on N5548A in accordance with Supplemental Type Certificate (STC) SA1-52. The STC requires airplanes with Hartzell propeller HC-B3 (P, R) 30-2E/(P, R) 10152-51/2 be equipped with following placard, "Propeller cannot be feathered below 500 RPM" The placard on N5548A stated, "Do not feather props under 500 RPM."

ADDITIONAL INFORMATION

The aircraft wreckage was released to Mr. Craig Walker, President, Marco Flite Services, Inc., Margate, Florida, on April 3, 1999. The four magnetos, left propeller governor and Pilots Handbook for G-21A Grumman Goose, Model JRF-5 Airplane was released to Mr. Walker on May 5, 1999.

Pilot Information

Certificate:	Airline Transport	Age:	40, Male
Airplane Rating(s):	Multi-engine Land; Multi-engine Sea; 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:	
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	12/14/1998
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	10000 hours (Total, all aircraft), 520 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman	Registration:	N5548A
Model/Series:	G-21A G-21A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	75-7661
Landing Gear Type:	Retractable - Float; Hull; Tailwheel	Seats:	8
Date/Type of Last Inspection:	12/08/1998, Annual	Certified Max Gross Wt.:	8000 lbs
Time Since Last Inspection:	31 Hours	Engines:	2 Reciprocating
Airframe Total Time:	13136 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	R-985-14B
Registered Owner:	TROPIC BIRD LANDING INC.	Rated Power:	450 hp
Operator:	TROPIC BIRD LANDING INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	FXE, 14 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	1153 EST	Direction from Accident Site:	50°
Lowest Cloud Condition:	Scattered / 4700 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	140°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	86° C / 78° C
Precipitation and Obscuration:			
Departure Point:	MIAMI, FL (X-44)	Type of Flight Plan Filed:	None
Destination:	(FXE)	Type of Clearance:	None
Departure Time:	1129 EST	Type of Airspace:	Class D

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	CARROL A SMITH	Report Date:	07/12/2000
Additional Participating Persons:	RAY BAHAMONDE; FORT LAUDERDALE, FL THOMAS J MCCREARY; PIQUA, OH		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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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](#).