



# Aviation Investigation Final Report

<b>Location:</b>	San Juan, Puerto Rico	<b>Accident Number:</b>	ANC05FA038
<b>Date &amp; Time:</b>	February 28, 2005, 11:20 Local	<b>Registration:</b>	N97VB
<b>Aircraft:</b>	Aero Commander 500-S	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	3 Serious, 4 Minor
<b>Flight Conducted Under:</b>	Part 135: Air taxi & commuter - Non-scheduled		

## Analysis

The non-Spanish speaking commercial pilot was preparing for a Title 14, CFR Part 135 on-demand charter flight in a twin-engine airplane with gasoline engines. A non-English speaking fuel truck operator inadvertently serviced the accident airplane with 120 gallons of Jet-A turbine fuel. In the pilot's written statement he reported that just after takeoff, with six passengers aboard, both engines began to lose power, and the airplane subsequently descended and collided with tree-covered terrain at the departure end of the runway. An on-site examination of the fuel vender's Jet-A fuel truck disclosed that the dispensing nozzle installed on the truck was the same nozzle as a typical gasoline nozzle. An examination of the accident airplane's fuel caps and fueling ports disclosed that the accident airplane was equipped with round, fuel tank inlet restrictors, that would prevent fueling from a jet fuel nozzle of the appropriate size, but the fueling ports were not placarded with the required statement indicating that only gasoline (av-gas) should be used.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fuel truck operator's improper refueling of a gasoline engine powered airplane with jet (turbine) fuel, and the pilot's inadequate preflight, which resulted in a loss of power in both engines and subsequent collision with trees. Factors associated with the accident were the unclear communications between the Spanish-speaking fuel truck operator and the English-speaking pilot, and the fuel truck operator's lack of familiarity with the accident airplane's fueling requirements. An additional factor was the absence of the required placards adjacent to the fuel filler caps indicating that only gasoline (av-gas) should be used.

## Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) AIRCRAFT SERVICE - IMPROPER - FBO PERSONNEL
2. (F) INFORMATION UNCLEAR(LANGUAGE) - FBO PERSONNEL
3. (C) FLUID,FUEL GRADE - INCORRECT
4. (F) LACK OF FAMILIARITY WITH AIRCRAFT - FBO PERSONNEL
5. 2 ENGINES - LOSS,PARTIAL
6. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
7. (F) FUEL SUPPLY - NOT IDENTIFIED - COMPANY MAINTENANCE PERSONNEL

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Occurrence #2: FORCED LANDING  
Phase of Operation: DESCENT - EMERGENCY

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Occurrence #3: IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

### Findings

8. OBJECT - TREE(S)

## Factual Information

### HISTORY OF FLIGHT

On February 28, 2005, about 1120 Atlantic standard time, an Aero Commander 500-S airplane, N97VB, sustained substantial damage following a loss of power from both engines and a subsequent collision with tree-covered terrain during takeoff from the Luis Munoz Marin International Airport, San Juan, Puerto Rico. The airplane was being operated by Clair Aero, St. Thomas, U.S. Virgin Islands, as a Title 14, CFR Part 135, on-demand charter flight. Of the seven people aboard, the commercial pilot and two passengers sustained serious injuries, and four passengers sustained minor injuries. Visual meteorological conditions prevailed at the time of the accident, and company flight following procedures were in effect. The flight originated about 1110, from the Luis Munoz Marin International Airport, and was en route to the Virgin Gorda Airport, Virgin Gorda, British Virgin Islands.

The accident airplane was equipped with two, gasoline reciprocating, Lycoming IO-540 series engines. During an interview with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on March 1, an operations supervisor with the Luis Munoz Marin International Airport, reported that when he arrived at the accident site, he noted a strong smell of jet fuel. The operations supervisor, a certificated private pilot, said that after all of the airplane's occupants had been taken to the hospital, he inspected the accident airplane's fuel tanks and confirmed the presence of jet fuel.

During an interview with the NTSB IIC on March 1, using a Spanish-speaking Federal Aviation Administration (FAA) airworthiness inspector from the San Juan Flight Standards District Office, one of the two fuel truck drivers that fueled the accident airplane said that earlier that morning he, along with a second, less experienced fuel truck driver, refueled a turbine powered Aero Commander 690B, with an undisclosed amount of Jet-A turbine fuel. He said that the accident airplane and the Aero Commander 690B looked very similar. The fuel truck driver reported that the accident pilot did not speak Spanish. He said that after agreeing on a price per gallon, the fuel truck driver instructed the less experienced fuel truck driver to service the accident airplane with Jet-A turbine fuel. The fuel truck driver said that before fueling began on the accident airplane, the pilot was asked to report to the U.S. Customs office located within the airport terminal building. By the time the pilot returned to the airplane, the refueling had been completed. According to the fuel truck driver, the pilot paid cash for the fuel and signed a receipt slip that showed 120.0 gallons of Jet-A turbine fuel had been pumped into the accident airplane.

During an interview with the NTSB IIC on March 1, the president of Borinquen Air, the fuel vendor who refueled the accident airplane, said that the accident pilot specifically asked his employees to service the airplane with Jet-A turbine fuel, and that his employee was only

complying with the pilot's request. The president emphatically denied that his employee's were in error, and that the accident pilot was only trying to save money by purchasing Jet-A turbine fuel instead of Avgas.

During the on-scene portion of the investigation the NTSB IIC was unable to interview the accident pilot due to injuries sustained in the accident.

In a written statement provided to the NTSB, the accident pilot reported that after arriving at the Luis Munoz Marin International Airport, he proceeded directly to the U.S. Customs office, located within a short walking distance from where his airplane was parked. He said that while walking across the airport's aircraft parking area, he was met by one of the Borinquen Air fuel truck operators. He reported that he specifically asked the fuel truck operator to wait for his return before fueling the accident airplane. Once the pilot returned to the airplane he discovered that the airplane had already been serviced with fuel, and that the fuel truck operator and the fuel truck were both gone. He said that while loading his passengers and their baggage, the fuel truck operator returned to the airplane, collected the money for the fuel purchase, and had the pilot sign a receipt for the purchase of the fuel. The pilot reported in his statement that just after takeoff, both engines began to lose power, and the airplane subsequently descended and collided with tree-covered terrain at the departure end of the runway.

According to the operator's chief pilot, the accident pilot did not speak or understand the Spanish language.

#### CREW INFORMATION

The pilot held a commercial pilot certificate with airplane single-engine land, and multiengine land ratings. His most recent first-class medical certificate was issued on February 19, 2004, and contained the limitation that he must wear corrective lens.

According to the NTSB Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by the operator, the pilot's total aeronautical experience consisted of about 1,038 hours, of which 282 were accrued in the accident airplane make and model. In the preceding 90 and 30 days prior to the accident, the report lists a total of 96 and 25 flight hours, respectively.

The pilot completed his most recent pilot-in-command, FAA Part 135 check ride on June 11, 2004. The check ride was conducted in an Aero Commander 500-S airplane; the same make and model as the accident airplane.

#### AIRCRAFT INFORMATION

The airplane had accumulated a total time of approximately 7,043 hours. The most recent 100-hours inspection was accomplished at an aircraft total time of 6,943, about 100 hours before the accident.

## METEOROLOGICAL INFORMATION

The closest official weather observation station is located at the Luis Munoz Marin International Airport, San Juan. On February 28, at 1156, an Aviation Routine Weather Report (METAR) was reporting, in part: Wind, 090 degrees (true) at 9 knots; visibility, 10 statute miles; clouds, 3,600 feet scattered; temperature, 81 degrees F; dew point, 70 degrees F; altimeter, 30.05 inHg.

## ADDITIONAL INFORMATION

During the on-scene portion of the investigation, the NTSB IIC, along with the FAA airworthiness inspector, examined Borinquen Air's Jet-A fuel truck. The examination revealed that the Jet-A dispensing nozzle was the same size as a typical gasoline nozzle. This diameter nozzle is smaller than the required size that normally prevents the nozzle from entering gasoline powered aircraft's fuel tanks, when those fuel tanks are fitted with anti-jet fuel restrictors.

The NTSB IIC and the FAA airworthiness inspector also inspected the accident airplane's fuel caps and fueling ports, and noted that the accident airplane was equipped with round, fuel tank inlet restrictors, that would prevent fueling from a jet fuel nozzle of the appropriate size. However, the fuel fueling ports were not placarded with any message indicating that only gasoline (av-gas) could be added to the accident airplane's fuel tanks.

The Civil Air Regulations, part 3, section 3.767, relating to airplane airworthiness states, in part: "Fuel, oil, and coolant filler openings. The following information shall be marked on or adjacent to the filler cover in each case: (a) The word "fuel" with the minimum permissible fuel [grade or designation] for the engines installed, and the usable fuel tank capacity."

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	36, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 With waivers/limitations	<b>Last FAA Medical Exam:</b>	February 1, 2004
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	June 1, 2004
<b>Flight Time:</b>	1038 hours (Total, all aircraft), 282 hours (Total, this make and model), 958 hours (Pilot In Command, all aircraft), 96 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Aero Commander	<b>Registration:</b>	N97VB
<b>Model/Series:</b>	500-S	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	3233
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>	December 1, 2004 100 hour	<b>Certified Max Gross Wt.:</b>	6750 lbs
<b>Time Since Last Inspection:</b>	100 Hrs	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	6943 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	IO-540-E1B5
<b>Registered Owner:</b>	CLAIR AERO	<b>Rated Power:</b>	290 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	On-demand air taxi (135)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	E07A

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	TJSJ,9 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	11:21 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Scattered / 3600 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	9 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	90°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.04 inches Hg	<b>Temperature/Dew Point:</b>	27°C / 21°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	San Juan , PR (TJSJ)	<b>Type of Flight Plan Filed:</b>	Company VFR
<b>Destination:</b>	Virgin Gorda (TUPW)	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:10 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Luis Munoz Marin Int'l Airport TJSJ	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	9 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	10	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	8016 ft / 150 ft	<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	2 Serious, 4 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	3 Serious, 4 Minor	<b>Latitude, Longitude:</b>	18.439167,-66.101669

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Johnson, Clinton
<b>Additional Participating Persons:</b>	Jorge Perez; Federal Aviation Administration; San Juan, PR
<b>Original Publish Date:</b>	February 28, 2006
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=61071">https://data.nts.gov/Docket?ProjectID=61071</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).