

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

SP-20  
Log 1738

ISSUED: November 5, 1985

Forwarded to:

Honorable Donald D. Engen  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-85-88 through -90

At 1609 eastern daylight time on September 24, 1984, a Piper PA-31T3, N9193Y, collided with the ground about 1,500 feet short of the landing threshold of runway 8 at the William B. Hartsfield International Airport, Atlanta, Georgia, following the loss of engine power. The airplane was registered to HRS Textiles, Inc. and was operated by Pee Dee Air Express, Inc., doing business as Trans Southern Airways. The flight, operating as Pee Dee Flight 561, was executing an Instrument Landing System (ILS) approach during visual meteorological conditions. The airplane was substantially damaged; the copilot and five passengers were seriously injured; and the pilot and four passengers received minor injuries. The flight had originated at Florence, South Carolina, on September 24, 1984, at 1446. 1/

The National Transportation Safety Board's examination of the airplane confirmed that the loss of power in both engines was the result of fuel exhaustion. Tests of the fuel quantity measuring system revealed that the fuel quantity sensors (which had different part numbers) had been installed in the main inboard and main outboard fuel tanks in both wings, i.e., the appropriate type of sensor for the inboard tank was installed in the outboard tank and vice versa. Simulation tests showed that, with these fuel sensors interchanged, the fuel quantity gauge indicated about 90 pounds more fuel per side (180 pounds total) than was actually in the tanks.

Using the performance charts in the Pilots Operating Handbook, the expected fuel consumption for the mishap flight was calculated at 763 pounds. Addition of the two 90-pound fuel errors caused by interchanged sensors established that a departure fuel load of about 760 pounds would have been indicated on the fuel gauge as about 950 pounds. The flightcrew stated that the fuel gauges indicated a total of about 950 pounds of fuel aboard at departure. The gauges are graduated in 50-pound increments.

1/ For more detailed information, see Aircraft Accident/Incident Summary Report--"Pee Dee Air Express, Inc. Piper PA-31T3, N9193Y, Atlanta, Georgia September 24, 1984" (NTSB/AAR-85/02/SUM).

The Piper Maintenance Manual lists two procedures for calibration of the fuel quantity system. The first is accomplished using an electrical capacitance test set. The second procedure (wet calibration) requires complete defueling of the airplane, checking the fuel quantity gauges for accuracy, adjustment of the gauges if needed, fueling the tanks, and checking the gauges for proper indications. The first procedure would have indicated that the fuel sensors were interchanged; the second procedure did not and will not reveal that the wrong fuel sensors have been installed in one or more tanks.

According to the company maintenance records, the fuel quantity system was calibrated using the wet calibration procedure outlined in the Piper PA-31T3 Maintenance Manual. The company did not have a capacitance type of calibration test set. There was no record of previous discrepancies involving the fuel indicating system, and there was no record showing removal or reinstallation of the fuel sensors during the airplane's service life. Consequently, the fuel tank sensors were installed improperly during manufacture of the airplane, and a similar condition might exist in other Piper airplanes equipped with this fuel quantity sensing system.

Since the unsafe conditions found on the accident airplane might be present in the 813 airplanes in the Piper PA-31T and PA-42 fleet, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive to require owners and operators of Piper PA-31T and PA-42 model series airplanes to inspect and verify that the fuel quantity sensor installation conforms to the manufacturer's specifications and to require that a fuel quantity calibration check be performed using a capacitance type of calibration test set. (Class II, Priority Action) (A-85-88)

Require the Piper Aircraft Corporation to modify the main inboard and main outboard fuel quantity sensors in PA-31T and PA-42 model series airplanes to eliminate the possibility of installing the wrong sensors. (Class II, Priority Action) (A-85-89)

Require the Piper Aircraft Corporation to amend the maintenance manuals for the PA-31T and PA-42 model series airplanes to require use of the capacitance type of calibration test set when checking the fuel quantity indication systems for accuracy and to delete any other test procedure. (Class III, Longer-Term Action) (A-85-96)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.

By: Jim Burnett  
Chairman

