



National Transportation Safety Board Aviation Accident Final Report

Location:	San Juan, PR	Accident Number:	ERA09LA266
Date & Time:	04/26/2009, 0415 EDT	Registration:	N136FS
Aircraft:	DOUGLAS DC3	Aircraft Damage:	Substantial
Defining Event:	Fire/smoke (non-impact)	Injuries:	4 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

During taxi to a runway, the instrument panel and cockpit floor erupted in flames. Examination of the wreckage revealed that the majority of the wires contained inside the main junction box had very little damage except for two wires that had insulation missing. The damage appeared to be associated with the routing of the two wires. Both wires were connected to the battery relay and ran through wires in and around the exposed terminal studs. Heat damage was noted on the insulation of wires and other components that were in contact with the exposed wires. The wires ran from the battery relay to the forward section of the cockpit, where the fire started. Due to the fire damage that consumed the cockpit, the examination was unable to determine what system the wires were associated with. Further examination revealed that the fuel pressure was a direct indicating system. Fuel traveled directly to the instruments in the cockpit via rigid aluminum lines routed on the right lower side of the fuselage, where more severe fire damage was noted. Review of maintenance records did not reveal any evidence of the fuel pressure indicating system lines and hoses having ever been replaced; however, they were only required to be replaced on an as-needed basis. The electrical system, instrument lines, and hoses through the nose compartment were required to be inspected on a Phase D inspection; the airplane's last Phase D inspection was completed about 9 months prior to the accident and the airplane had accrued 313.1 hours of operation since that inspection.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Worn electrical wires and a fuel pressure indicating system hose, which resulted in a ground fire during taxi.

Findings

Aircraft	Electrical power system - Damaged/degraded (Cause)
	Fuel indication system - Damaged/degraded (Cause)
	Hoses and tubes - Not specified

Factual Information

On April 26, 2009, about 0415 eastern daylight time, a Douglas DC3, N136FS, operated by Four Star Aviation Inc., was substantially damaged after experiencing a cockpit fire during taxi at Luis Munoz Marin International Airport (TJSJ), San Juan, Puerto Rico. The certificated airline transport pilot, certificated commercial pilot, and two crewmembers were not injured. Visual meteorological conditions prevailed for the planned flight to Cyril E King Airport (TIST), Charlotte Amalie, United States Virgin Islands. A company flight plan was filed for the cargo flight conducted under the provisions of 14 Code of Federal Regulations Part 135.

The flightcrew reported that they were transporting mail. While taxiing on "juliet" taxiway to runway 10, the instrument panel and cockpit floor erupted in flames while smoke filled the cockpit. As the pilots were shutting down the engines, they became overwhelmed with fire and smoke, and quickly exited the airplane along with the two cargo handlers. The flightcrew added that they did not note any abnormal instrument readings or any anomalies during preflight inspection.

The low-wing, tailwheel retractable-gear airplane, serial number 22405, was manufactured in 1942. It was powered by two Pratt and Whitney R-1830-90D, 1,200-horsepower engines. At the time of the accident, it was equipped with five seats due to a cargo configuration. The airplane had accumulated 19,952 total hours of operation at the time of the accident.

Examination of the wreckage by Federal Aviation Administration (FAA) inspectors revealed that the fire was intense, from the bulkhead behind the pilots' seats, to the front of the airplane. Everything was melted in that area, including instruments, switches, tubing, hoses, and skin. The inspectors noted more damage on the right side of the fuselage. They also noted that the left propeller was partially feathered.

The inspectors observed that the majority of the wires, contained inside the main junction box, had very little damage, except for two wires that had insulation missing. The damage appeared to be associated with the routing of the two wires. Both wires were connected to the battery relay and they ran through wires in and around the exposed terminal studs. Heat damage was noted on the insulation of wires and other components that were in contact with the exposed wires. The wires ran from the battery relay to the forward section of the cockpit, where the fire started. Due to the fire damage, the inspectors were unable to determine what system the wires were associated with; however, one of the systems connected to the battery relay is the propeller feathering system.

The inspectors added that the fuel pressure was a direct indicating system. Fuel traveled directly to the instruments via rigid aluminum lines routed on the right lower side of the fuselage. Review of maintenance records by the FAA inspectors revealed that the airplane was maintained under an FAA Approved Airplane Inspection Program. The review did not reveal any evidence of the fuel pressure indicating system lines and hoses having ever been replaced; however, they were only required to be replaced on an as needed basis.

Further review of maintenance records revealed that the electrical system, instrument lines, and hoses through the nose compartment were required to be inspected on a Phase D inspection. The airplane's last Phase D inspection was completed on July 14, 2008. The airplane had accrued 313.1 hours of operation, from the time of the last Phase D inspection, until the fire. The airplane's most recent inspection was a Phase B inspection, which was

completed on March 22, 2009. The airplane had accumulated 40 hours of operation since that inspection.

Review of the National Transportation Safety Board accident/incident database, and FAA service difficulty reports, did not reveal any similar events during the 5-year period preceding the accident.

History of Flight

Taxi-to runway	Fire/smoke (non-impact) (Defining event)
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Pilot Information

Certificate:	Airline Transport; Commercial	Age:	69, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	02/04/2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	12/28/2008
Flight Time:	50233 hours (Total, all aircraft), 7000 hours (Total, this make and model), 48800 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Commercial	Age:	29, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	12/01/2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	10/22/2008
Flight Time:	957 hours (Total, all aircraft), 204 hours (Total, this make and model), 650 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	DOUGLAS	Registration:	N136FS
Model/Series:	DC3	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	24405
Landing Gear Type:	Retractable - Tailwheel	Seats:	5
Date/Type of Last Inspection:	03/22/2009, AAIP	Certified Max Gross Wt.:	26900 lbs
Time Since Last Inspection:	40 Hours	Engines:	2 Reciprocating
Airframe Total Time:	19952 Hours	Engine Manufacturer:	P & W
ELT:	Installed, not activated	Engine Model/Series:	R-1830-90D
Registered Owner:	Four Star Aviation Inc	Rated Power:	1350 hp
Operator:	Four Star Aviation Inc	Air Carrier Operating Certificate:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	U4RA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	TJSJ, 9 ft msl	Observation Time:	0456 EDT
Distance from Accident Site:	0 Nautical Miles	Direction from Accident Site:	0°
Lowest Cloud Condition:	Few / 3600 ft agl	Temperature/Dew Point:	24° C / 21° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	4 knots, 100°	Visibility (RVR):	
Altimeter Setting:	30.04 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	San Juan, PR (TJSJ)	Type of Flight Plan Filed:	Company VFR
Destination:	Charlotte Amali, VI (TIST)	Type of Clearance:	None
Departure Time:	0428 EDT	Type of Airspace:	

Airport Information

Airport:	Luis Munoz Marin International (TJSJ)	Runway Surface Type:	
Airport Elevation:	9 ft	Runway Surface Condition:	
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	4 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	18.439444, -66.001944

Administrative Information

Investigator In Charge (IIC):	Robert J Gretz	Adopted Date:	11/09/2009
Additional Participating Persons:	Eugene Jester; FAA/FSDO; Miami, FL		
Publish Date:	11/21/2009		
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.ntsbt.gov/pubdms/ .		

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