Aviation Investigation Final Report

Location:	Elberfeld, Indiana	**Accident Number:**	CHI04LA078
Date & Time:	February 25, 2004, 16:35 Local	**Registration:**	N5450T
Aircraft:	Cessna R182	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The airplane sustained an in-flight fire during cruise flight on an aerial pipeline observation flight. The pilot performed a forced landing and the on-ground fire destroyed the airplane. The pilot reported that he conducted a through preflight examination of the aircraft. Fuel samples were taken from each tank, and the pilot stated that no fuel, oil, or any other discrepancies were revealed during the inspection. Approximately 1 hour and 20 minutes into the flight the pilot reported that he smelled wisps of smoke. The smell of smoke became stronger and forced the pilot to look for the source of the smell. The pilot then felt heat on his left shin and detected smoke emitting from beneath the left side of the instrument panel. The pilot opened his door to release the smoke from the cabin of the aircraft. The pilot noticed a small flame emitting from the electrical wiring bundle. The pilot used his fire extinguisher to douse the flame. The pilot reported that the engine continued to run normally at this time. The pilot initially made a turn for the closest airport that was approximately nine miles from his current position. However, a large, black cloud of smoke then filled the cockpit. The pilot decided to land the airplane as soon as possible. The pilot stated that he placed his head outside the window of pilot's side door in order to navigate and breathe. The pilot reported that while doing this, he saw a flame emitting from the right side of the engine cowl. The pilot landed the airplane, gear up, in a field. The pilot evacuated the airplane before the fire engulfed three-fourths of the fuselage. An on-scene examination was performed. Flight control continuity was established from the surfaces to cabin area. Testing was unable to be performed due to the extent of fire damage.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The in-flight and on-ground fires in the cabin and engine compartment for undetermined

reasons during the flight's cruise and emergency landing.

Findings

Occurrence #1: FIRE
Phase of Operation: CRUISE

Findings
1. ENGINE COMPARTMENT - FIRE
2. (C) REASON FOR OCCURRENCE UNDETERMINED
3. FUSELAGE,CABIN - FIRE

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

Findings
4. TERRAIN CONDITION - GROUND

Factual Information

On February 25, 2004, about 1635 eastern standard time (est), a Cessna R182, N5450T, piloted by a commercial pilot, sustained an in-flight fire during its cruise flight near Elberfeld, Indiana. The pilot performed a forced landing and the subsequent on-ground fire destroyed the airplane. The aerial pipeline observation flight was operating under 14 CFR Part 91. Visual meteorological conditions prevailed at the time of the accident. No flight plan was on file. The pilot reported no injuries. The flight originated from the Greater Kankakee Airport (IKK), near Kankakee, Illinois, about 1425 central standard time and was destined for the Maury County Airport, near Mount Pleasant (MKC), Tennessee.

The pilot reported that he completely refueled the airplane with 94 gallons of aviation fuel, and added a quart of oil to the engine at IKK. The pilot stated that he took fuel samples from both the wing sumps and main sump. No contamination was noticed and the sample fuel was returned to the left wing tank. The pilot performed a walk-around inspection of the airplane. The pilot reported that no fuel, oil, or any other discrepancies were revealed during the inspection. The pilot stated that the airplane started and ran normally. It was approximately 1 hour and 20 minutes before any indication of an in-flight fire.

The pilot stated:

> The first indication of a fire occurred during my radio conversation with Evansville Airport Approach Control. While asking for a clearance through their airspace, I smelled two brief wisps of smoke. ... During the next thirty to forty-five seconds ... the smell returned strongly enough for me to actively look outside for a possible source. ... I first felt a profound heat sensation on my left shin, and then noticed a pronounced plume of smoke wafting from beneath the left side instrument panel. ... I observed a small flame emitting from the electrical wiring bundle where it penetrates the engine firewall above the heater/defroster plenum near the outboard left edge of the firewall. I pushed my seat back fully and discharged the extinguisher towards the flame. The extinguisher agent immediately dispatched the flame, but also eliminated any forward visibility out of the cockpit. I opened the right door window and slipped the airplane to the left which caused a net airflow across the cockpit flushing out enough of the white cloud to allow me to see (and breathe) again. The engine continued operating normally during this event and I observed normal engine instrument indications (fuel pressure, manifold pressure, oil pressure, RPM and temperatures). I made a hard turn towards the airport (about 9 miles away) and initiated an emergency call to the airport but aborted the call as an overwhelming cloud of acrid black smoke

> suddenly filled the cockpit making it, again, impossible to breathe or to see straight ahead. My plan immediately became to land the airplane as soon as possible. I placed my head out the window to be able to breathe and to look for a landing spot. ... I realized that there was flame and black smoke coming from the left side of the engine cowling at about the level of the carburetor air inlet. I then slipped the plane to the right to attempt to shift the flame away from my window and to avoid a farmhouse. I leaned over towards the right window as far as I could without disconnecting my seatbelt/double shoulder harness. ... I briefly saw that there was smoke and possibly flame present on the right side of the cowling as well. I felt that I was no better off slipping to the right than to the left, so I resumed the left slip. ... The best spot to land, nearest a blacktop road, was going to require a small increase in power to make safely, but when I advanced the throttle I realized that the engine had failed. ... I then rolled out on a heading that was my best guess as to be in alignment with the length of the field and started a flare. I elected to leave the landing gear up and touched down in the plowed field near the bottom of the hill 200 yards west of the house on a southwesterly heading. The aircraft skidded briefly straight ahead without bouncing, then stopped. The windshield was partially dislodged and the visible flames from the cowl subsided. ... The right door was sprung and easily opened when I kicked it. I was able to crawl out unaided and walked away from the aircraft.

The pilot reported that after exiting the aircraft, the flames continued to build until the fire completely engulfed the forward three-fourths of the fuselage and both of the inner wing panels before the local fire department arrived.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with an airplane single engine land rating. His most recent FAA second-class medical certificate was issued on May 5, 2003, with a limitation to wear corrective lenses. He reported that he had accumulated 39,700 hours total flight time. The pilot reported that he flew 300 hours in the 90 days prior to the accident, 110 hours in the 30 days prior to the accident, and 16 hours in the 24 hours prior to the accident in the same make and model airplane as the accident airplane.

AIRCRAFT INFORMATION

N5450T, a Cessna R182, serial number R18201869, was a high wing, propeller-driven,

retractable landing gear, semi-monocoque design, four-seat airplane. A 235 horsepower, six-cylinder, air cooled, horizontally opposed, Lycoming O-540-J3C5D, serial number L-23263-40A, engine, powered the airplane. The engine was overhauled on November 6, 2000. The carburetor was a Precision HA-6. It was replaced on August 27, 2003, and it had accumulated approximately 438.5 hours of time in service. The pilot reported that it had not exhibited any leaking prior to the accident. The mechanical fuel pump was a new Lycoming LW15472 at the time of the engine overhaul. The pump had a total of approximately 1,630 hours in service at the time of the accident. The pilot reported that the electric fuel pump (a Dukes 1500-00-31NV) was replaced last year and had approximately 700 hours in service at the time of the accident.

The pilot reported that an annual inspection of the airframe and engine was accomplished on February 19, 2003, and that the airplane had accumulated a total time of 12,523.9 hours. The airplane was flown approximately for 1,076 hours since the time of annual inspection to the day of the accident.

The pilot reported that the last servicing of the accident airplane took place earlier in the week in Tulsa, Oklahoma. The oil was changed, the spark plugs were cleaned, and a general inspection of the engine compartment and flight controls took place.

METEOROLOGICAL INFORMATION

At 1654 est, the Evansville Regional Airport (EVV), Evansville, Indiana recorded weather was: Wind 090 degrees at 11 knots; visibility 10 statue miles; sky condition clear; temperature 09 degrees C; dew point -07 degrees C; altimeter 30.16 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

A Federal Aviation Administration (FAA) inspector examined the wreckage of the accident airplane on February 26, 2004. The inspector reported that the majority of aircraft was consumed by fire. He stated that the tail section was intact, the outer section of the both wings remained intact, and that both fuel tanks had ruptured. The fire destroyed the entire cabin area. He reported that the inboard section of the wings had extensive fire damage. The inspector stated that control continuity could only be accomplished from the control surface to the cabin section and that the control cables were encased in the molten remains of the aircraft.

The inspector reported that the engine compartment had extensive fire damage. The carburetor, engine sump, accessory drive case, and all accessories were completely consumed in the fire. He stated that the bottom of the crankcase had a large hole were the aluminum case had melted. The inspector reported that a fuel line, that appeared to be one from the firewall to the carburetor, had the remains of its fittings still attached and those fittings were

not loose. The propeller blades melted to the hub.

TESTS AND RESEARCH

Testing was unable to be performed due to the extent of fire damage.

ADDITIONAL INFORMATION

The FAA was a party to the investigation.

Pilot Information

Certificate:	Commercial	**Age:**	53,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	May 5, 2003
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 14, 2002
Flight Time:	39700 hours (Total, all aircraft), 10250 hours (Total, this make and model), 39600 hours (Pilot In Command, all aircraft), 300 hours (Last 90 days, all aircraft), 110 hours (Last 30 days, all aircraft), 16 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5450T
Model/Series:	R182	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	R18201869
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 19, 2003 Annual	**Certified Max Gross Wt.:**	3100 lbs
Time Since Last Inspection:	1075.1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	12523.9 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-540
Registered Owner:	BP PIPELINES (NORTH AMERICA) INC.	**Rated Power:**	235 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EVV,418 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	16:54 Local	**Direction from Accident Site:**	223°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 0 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.15 inches Hg	**Temperature/Dew Point:**	9°C / -7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	KANKAKEE, IL (IKK)	**Type of Flight Plan Filed:**	None
Destination:	Mt. Pleasant, TN (MRC)	**Type of Clearance:**	None
Departure Time:	14:25 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	EVANSVILLE REGIONAL EVV	**Runway Surface Type:**	
Airport Elevation:	418 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	Both in-flight and on-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	38.125831,-87.416114

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	George Ballard; Federal Aviation Administration; Indianapolis, IN
Original Publish Date:	September 1, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=58812