# National Transportation Safety Board
# Aviation Accident Final Report

| | | | |
|---|---|---|---|
| **Location:** | MCGRATH, AK | **Accident Number:** | ANC98LA014 |
| **Date & Time:** | 01/02/1998, 1526 AST | **Registration:** | N861TA |
| **Aircraft:** | Douglas DC-6B | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 3 None |
| **Flight Conducted Under:** | Part 125: 20+ Pax,6000+ lbs | | |

## Analysis

During the takeoff roll, while passing 45 knots indicated airspeed, ice formed between the inner and outer panes of the airplane's windshield, obscuring the crew's vision. The flight crew aborted the takeoff, the airplane drifted off the left side of the snow covered runway, and caught fire. The crew reported the airplane and windshield were cold soaked and the temperature was -10 degrees Fahrenheit. The windshield anti-ice system blows air from a combustion heater between the windshield glass panes. The air source for the heater, once the airplane has forward airspeed, is two leading edge wing scoops. The crew told the NTSB investigator that the taxi time was too short for the windshield to warm up, and that during the taxi, snow was circulated around the airplane and into the wing scoops.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The ingestion of snow into the windshield anti-ice system, and the resulting obscured windshield which made runway alignment not possible. Factors associated with this accident were the cold windshield, the reduced performance of the windshield anti-ice because of the short taxi by the crew, and the insufficient information on the system provided by the manufacturer.

## Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: TAKEOFF - ROLL/RUN

Findings
1. (C) ANTI-ICE/DEICE SYSTEM,WINDSHIELD - ICE INGESTION
2. (F) ANTI-ICE/DEICE SYSTEM,WINDSHIELD - TOO COLD
3. (F) ANTI-ICE/DEICE SYSTEM - DIMINISHED - PILOT IN COMMAND
4. (F) INFORMATION INSUFFICIENT - KIT MANUFACTURER
---

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: TAKEOFF - ABORTED

Findings
5. WINDOW,FLIGHT COMPARTMENT WINDOW/WINDSHIELD - OBSTRUCTED
6. (C) PROPER ALIGNMENT - NOT POSSIBLE - PILOT IN COMMAND
7. TERRAIN CONDITION - BERM
---

Occurrence #3: FIRE
Phase of Operation: TAKEOFF - ABORTED

## Factual Information

On January 2, 1998, at 1526 Alaska standard time, a Douglas DC-6B airplane, N861TA, departed the edge of runway 34 during an aborted takeoff from the Nixon Fork Mine landing strip, thirty miles north of McGrath, Alaska. The transport category airplane was destroyed by a postcrash fire. The airline transport certificated pilot, and the other two flight crewmembers, were uninjured. The airplane was operated by Woods Air Fuel, Inc., of Palmer, Alaska. The flight was operated under 14 CFR Part 125 as a cargo flight transporting ore concentrate from Nixon Fork Mine. The flight originated from Palmer at 1230, and was on the takeoff roll of the return leg. Visual meteorological condition prevailed at the time of the accident, and an IFR flight plan was on file.

The captain reported that at an indicated airspeed of 45 knots during the takeoff roll, ice formed between the inner and outer windshield panes, with the icing following the flow of heated air through the windshield. The crew's forward visibility was obscured, and the takeoff was aborted. The captain reported that the airplane drifted left into snow berms on the side of the 4,200 feet long by 85 feet wide runway and caught fire. The three crewmen evacuated the airplane without injury.

The three crewmen relayed to the NTSB investigator that after arrival at the mine strip, the airplane and windshield cold soaked for about one hour in the -10 degree Fahrenheit temperature. After loading the airplane, they taxied for only a few minutes in light, powdery snow, before beginning the takeoff roll. The crewmen stated that the windshield anti-ice system was activated, but because of the short taxi, did not have time to warm completely. All crewmembers indicated that during the taxi, snow was circulated around the airplane and the wing scoops.

Research revealed that the windshield anti-ice system was modified as part of installing Supplemental Type Certificate (STC) number 981SO on June 26, 1987. This STC eliminated the superchargers on engines numbers 3 and 4 from providing conditioned air to the airplane's cabin. The modification was part of a conversion to a cargo configuration.

The modified cockpit heating and windshield anti-ice system receives supply air from one of two sources. On the ground, a blower fan draws air from the underside of the fuselage for a combustion heater. As the airplane transitions to flight, ram air pressure from two wing leading edge scoops becomes greater than ground blower discharge air, and becomes the heater air supply source. Air and any particulate matter in the wing scoops and ducting passes directly to the heater. Once airborne, the blower fan is deactivated by a weight on wheels switch.

From the heater the warm air is ducted directly to the windshield, where it flows between the outer glass pane and the inner vinyl pane, and is then discharged into the cockpit.

The "DC-6 Airplane Operating Manual" used by two other companies states "...Certain combinations of temperature and humidity will cause moisture to condense from the air between the windshield panels and settle on the inner surfaces of the glass, obscuring vision. Once formed, anti-icing airflow with heater operation will be required to clear the panels." This language is not included in the STC literature, nor in the flight handbook for the company operating the accident airplane.

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Airline Transport; Flight Instructor; Commercial; Flight Engineer | **Age:** | 55, Male |
| **Airplane Rating(s):** | Multi-engine Land; 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):** | Airplane Multi-engine; Airplane Single-engine | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 Valid Medical--w/ waivers/lim. | **Last FAA Medical Exam:** | 01/31/1997 |
| **Occupational Pilot:** | | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 27000 hours (Total, all aircraft), 16000 hours (Total, this make and model), 24000 hours (Pilot In Command, all aircraft), 250 hours (Last 90 days, all aircraft), 55 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | Douglas | **Registration:** | N861TA |
| **Model/Series:** | DC-6B DC-6B | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | No |
| **Airworthiness Certificate:** | Transport | **Serial Number:** | 43522 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | 12/22/1997, AAIP | **Certified Max Gross Wt.:** | 103800 lbs |
| **Time Since Last Inspection:** | 25 Hours | **Engines:** | 4 Reciprocating |
| **Airframe Total Time:** | 46626 Hours | **Engine Manufacturer:** | P&W |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | R-2800-CB-16 |
| **Registered Owner:** | WOODS AIR FUEL, INC. | **Rated Power:** | 2400 hp |
| **Operator:** | WOODS AIR FUEL, INC. | **Operating Certificate(s) Held:** | Air Cargo |
| **Operator Does Business As:** | | **Operator Designator Code:** | W4FB |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual Conditions | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | , 0 ft msl | **Distance from Accident Site:** | 0 Nautical Miles |
| **Observation Time:** | 0000 | **Direction from Accident Site:** | 0° |
| **Lowest Cloud Condition:** | Clear / 0 ft agl | **Visibility** | 60 Miles |
| **Lowest Ceiling:** | None / 0 ft agl | **Visibility (RVR):** | 0 ft |
| **Wind Speed/Gusts:** | Calm / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | Variable | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | | **Temperature/Dew Point:** | -23°C |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | NIXON FORK MINE, AK (NFR) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | PALMER, AK (PAQ) | **Type of Clearance:** | IFR |
| **Departure Time:** | 1526 AST | **Type of Airspace:** | Class G |

## Airport Information

| | | | |
|---|---|---|---|
| **Airport:** | NIXON FORK MINE STRIP (NFR) | **Runway Surface Type:** | Snow |
| **Airport Elevation:** | 1500 ft | **Runway Surface Condition:** | Dry; Snow--dry |
| **Runway Used:** | 34 | **IFR Approach:** | None |
| **Runway Length/Width:** | 4200 ft / 85 ft | **VFR Approach/Landing:** | |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 3 None | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | N/A | **Aircraft Fire:** | On-Ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | On-Ground |
| **Total Injuries:** | 3 None | **Latitude, Longitude:** | |

## Administrative Information

| | | | |
|---|---|---|---|
| **Investigator In Charge (IIC):** | MATTHEW L THOMAS | **Report Date:** | 02/15/2001 |
| **Additional Participating Persons:** | ALLAN R LEE; ANCHORAGE, AK<br>JAMES C HEIRSTON; ANCHORAGE, AK | | |
| **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.ntsb.gov/pubdms/. | | |