



# National Transportation Safety Board Aviation Accident Final Report

|                                |   |                         |                 |
|--------------------------------|---|-------------------------|-----------------|
| <b>Location:</b>               | Mekoryuk, AK                              | <b>Accident Number:</b> | ANC13LA012      |
| <b>Date &amp; Time:</b>        | 12/03/2012, 1050 AST                      | <b>Registration:</b>    | N169LJ          |
| <b>Aircraft:</b>               | CESSNA 208B                               | <b>Aircraft Damage:</b> | Substantial     |
| <b>Defining Event:</b>         | Powerplant sys/comp malf/fail             | <b>Injuries:</b>        | 1 Minor, 8 None |
| <b>Flight Conducted Under:</b> | Part 135: Air Taxi & Commuter - Scheduled |                         |                 |

## Analysis

Shortly after the scheduled commuter flight departed with the second-in-command (SIC) at the controls, the engine "coughed," started vibrating, and lost power. The SIC attempted to restart the engine, but was unsuccessful. Subsequently, the pilot-in-command assumed control of the airplane and landed on a frozen bay, which resulted in substantial damage to the airplane's right wing and fuselage. A postaccident examination of the airplane's engine revealed that one of the first-stage compressor blades had fractured due to fatigue cracking. The source of the fatigue crack could not be determined due to secondary damage sustained to the fracture surface.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The total loss of engine power as a result of a fractured first-stage compressor blade due to fatigue cracking. The source of the fatigue crack could not be determined due to secondary damage sustained to the fracture surface.

## Findings

|                       |   |
|-----------------------|---|
| <b>Aircraft</b>       | Compressor section - Fatigue/wear/corrosion (Cause)<br>Compressor section - Failure (Cause) |
| <b>Not determined</b> | Not determined - Unknown/Not determined (Cause)   |

## Factual Information

On December 3, 2012, about 1050 Alaska standard time, a Cessna 208B airplane, N169LJ, sustained substantial damage during a forced landing shortly after takeoff from the Mekoryuk Airport, Mekoryuk, Alaska. Of the nine people aboard, the two pilots and six passengers were not injured, and one passenger sustained minor injuries. The airplane was being operated as Flight 140, by Hageland Aviation Services, Inc., dba ERA Alaska, Anchorage, Alaska, as a visual flight rules (VFR) scheduled commuter flight under the provisions of 14 Code of Federal Regulations (CFR) Part 135. Visual meteorological conditions prevailed, and company flight following procedures were in effect. The flight originated at the Mekoryuk Airport about 1045, and was destined for Bethel, Alaska.

In a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot-in-command (PIC) stated that the second-in-command (SIC) was the flying pilot for the flight to Bethel. He said that the takeoff and initial climb were normal, but shortly after passing 1,000 feet, the engine "coughed," started vibrating, and lost power. An attempt to restart the engine was not successful. The PIC assumed control of the airplane, and landed on a frozen bay approximately 5 miles northeast of the Mekoryuk Airport. Witnesses at the airport observed the airplane descending, and responded with snow machines, and all-terrain vehicles to transport the airplane's occupants back to Mekoryuk.

During the forced landing the airplane sustained substantial damage to the fuselage and right wing.

The airplane was equipped with a Pratt & Whitney PT6A-114A turbine engine. A postaccident engine examination, performed at the facilities of Pratt & Whitney Canada, St. Hubert, Quebec, Canada, and under the direction of a senior NTSB powerplants investigator, revealed that a blade on the first stage compressor rotor failed as a result of a fatigue fracture. The fatigue crack initiated from the leading edge area and then propagated towards the trailing edge, and at mid-chord, the blade released by tensile overload. The initiation of the fracture could not be determined because of secondary damage to the fracture surface. A copy of the Safety Board powerplants investigator's report is included in the public docket for this incident.

During the last engine overhaul, 5 first stage compressor blades were replaced with new blades. The blade that failed during the accident flight was one of the five replaced blades based on the batch numbers recorded on the blades.

## History of Flight

|               |  |
|---------------|--|
| Initial climb | Powerplant sys/comp malf/fail (Defining event)<br>Loss of engine power (total) |
| Landing       | Collision with terr/obj (non-CFIT)   |

## Pilot Information

|                                  |  |  |                            |
|----------------------------------|--|--|----------------------------|
| <b>Certificate:</b>              | Commercial   | <b>Age:</b>                              | 31                         |
| <b>Airplane Rating(s):</b>       | Multi-engine Land; Single-engine Land  | <b>Seat Occupied:</b>                    | Left                       |
| <b>Other Aircraft Rating(s):</b> | None   | <b>Restraint Used:</b>                   | Seatbelt, Shoulder harness |
| <b>Instrument Rating(s):</b>     | Airplane   | <b>Second Pilot Present:</b>             | Yes                        |
| <b>Instructor Rating(s):</b>     | None   | <b>Toxicology Performed:</b>             |                            |
| <b>Medical Certification:</b>    | Class 2 With Waivers/Limitations   | <b>Last Medical Exam:</b>                | 04/18/2012                 |
| <b>Occupational Pilot:</b>       | Yes  | <b>Last Flight Review or Equivalent:</b> | 08/12/2012                 |
| <b>Flight Time:</b>              | 7932 hours (Total, all aircraft), 2732 hours (Total, this make and model), 7332 hours (Pilot In Command, all aircraft), 170 hours (Last 90 days, all aircraft), 69 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) |  |                            |

## Co-Pilot Information

|                                  |   |  |                            |
|----------------------------------|---|--|----------------------------|
| <b>Certificate:</b>              | Commercial  | <b>Age:</b>                              | 26, Male                   |
| <b>Airplane Rating(s):</b>       | Multi-engine Land; Single-engine Land   | <b>Seat Occupied:</b>                    | Right                      |
| <b>Other Aircraft Rating(s):</b> | None  | <b>Restraint Used:</b>                   | Seatbelt, Shoulder harness |
| <b>Instrument Rating(s):</b>     | Airplane  | <b>Second Pilot Present:</b>             | Yes                        |
| <b>Instructor Rating(s):</b>     | None  | <b>Toxicology Performed:</b>             |                            |
| <b>Medical Certification:</b>    | Class 2 With Waivers/Limitations  | <b>Last Medical Exam:</b>                | 02/01/2012                 |
| <b>Occupational Pilot:</b>       | Yes   | <b>Last Flight Review or Equivalent:</b> | 07/06/2012                 |
| <b>Flight Time:</b>              | 923 hours (Total, all aircraft), 368 hours (Total, this make and model), 417 hours (Pilot In Command, all aircraft), 174 hours (Last 90 days, all aircraft), 52 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) |  |                            |

## Aircraft and Owner/Operator Information

|                               |   |                                    |                            |
|-------------------------------|---|------------------------------------|----------------------------|
| Aircraft Manufacturer:        | CESSNA  | Registration:                      | N169LJ                     |
| Model/Series:                 | 208B  | Aircraft Category:                 | Airplane                   |
| Year of Manufacture:          |   | Amateur Built:                     | No                         |
| Airworthiness Certificate:    | Normal  | Serial Number:                     | 208B0599                   |
| Landing Gear Type:            | Tricycle  | Seats:                             | 12                         |
| Date/Type of Last Inspection: | 11/29/2012, AAIP                                      | Certified Max Gross Wt.:           |                            |
| Time Since Last Inspection:   | 123 Hours   | Engines:                           | 1 Turbo Prop               |
| Airframe Total Time:          | 11516 Hours   | Engine Manufacturer:               | P&W                        |
| ELT:                          | C126 installed, activated, aided in locating accident | Engine Model/Series:               | PT6A SER                   |
| Registered Owner:             | ICECAP LLC TRUSTEE                                    | Rated Power:                       | 750 hp                     |
| Operator:                     | Hageland Aviation Services                            | Air Carrier Operating Certificate: | Commuter Air Carrier (135) |
| Operator Does Business As:    | ERA Alaska  | Operator Designator Code:          | EPUA                       |

## Meteorological Information and Flight Plan

|                                  |                                  |                               |               |
|----------------------------------|----------------------------------|-------------------------------|---------------|
| Conditions at Accident Site:     | Visual Conditions                | Condition of Light:           | Day           |
| Observation Facility, Elevation: | PAMY                             | Observation Time:             | 1056 AST      |
| Distance from Accident Site:     | 4 Nautical Miles                 | Direction from Accident Site: | 40°           |
| Lowest Cloud Condition:          | Clear                            | Temperature/Dew Point:        | -13°C / -17°C |
| Lowest Ceiling:                  | None                             | Visibility                    | 10 Miles      |
| Wind Speed/Gusts, Direction:     | 7 knots, 40°                     | Visibility (RVR):             |               |
| Altimeter Setting:               | 30.25 inches Hg                  | Visibility (RVV):             |               |
| Precipitation and Obscuration:   | No Obscuration; No Precipitation |                               |               |
| Departure Point:                 | Mekoryuk, AK (PAMY)              | Type of Flight Plan Filed:    | Company VFR   |
| Destination:                     | Bethel, AK (PABE)                | Type of Clearance:            | None          |
| Departure Time:                  | 1045 AST                         | Type of Airspace:             |               |

## Airport Information

|                      |                |                           |                |
|----------------------|----------------|---------------------------|----------------|
| Airport:             | Mekoryuk (MYU) | Runway Surface Type:      |                |
| Airport Elevation:   | 48 ft          | Runway Surface Condition: |                |
| Runway Used:         | N/A            | IFR Approach:             | None           |
| Runway Length/Width: |                | VFR Approach/Landing:     | Forced Landing |

## Wreckage and Impact Information

|                            |                 |                             |                              |
|----------------------------|-----------------|-----------------------------|------------------------------|
| <b>Crew Injuries:</b>      | 2 None          | <b>Aircraft Damage:</b>     | Substantial                  |
| <b>Passenger Injuries:</b> | 1 Minor, 6 None | <b>Aircraft Fire:</b>       | None                         |
| <b>Ground Injuries:</b>    | N/A             | <b>Aircraft Explosion:</b>  | None                         |
| <b>Total Injuries:</b>     | 1 Minor, 8 None | <b>Latitude, Longitude:</b> | 60.400000, -166.336944 (est) |

## Administrative Information

|  |  |                      |            |
|--|--|----------------------|------------|
| <b>Investigator In Charge (IIC):</b>     | Christopher R Shaver   | <b>Adopted Date:</b> | 01/30/2014 |
| <b>Additional Participating Persons:</b> | Dave Keenan; FAA AVP-100; Washington, DC<br>David C Lowell; Hageland Aviation; Anchorage, AK<br>Andrew Hall; Cessna Aircraft; Wichita, KS<br>Marc Gratton; Pratt & Whitney Canada Corp.; Montreal, Canada, |                      |            |
| <b>Publish Date:</b>                     | 01/30/2014   |                      |            |
| <b>Investigation Docket:</b>             | <a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=85738">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=85738</a>  |                      |            |

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.