

AAR 87/01/SUM

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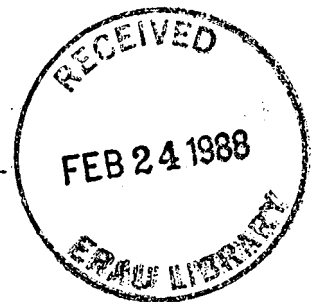
NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

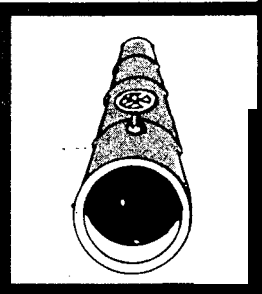
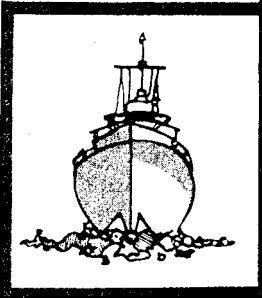
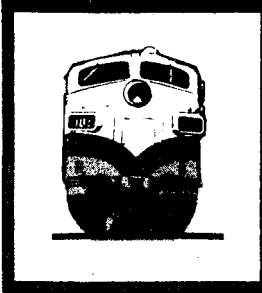
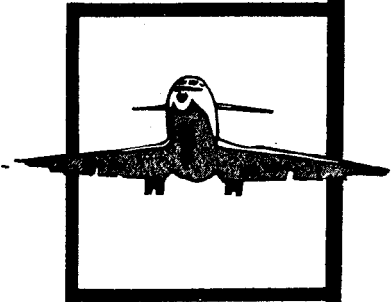
AIRCRAFT ACCIDENT/INCIDENT SUMMARY REPORT

KEFLAVIK, ICELAND - - JANUARY 29, 1986

NTSB/AAR-87/01/SUM



UNITED STATES GOVERNMENT



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TECHNICAL REPORT DOCUMENTATION PAGE

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16. Abstract <i>This report is a summary of an aircraft accident investigated by the National Transportation Safety Board. The accident occurred in International Waters, 36 miles west of Keflavik, Iceland on January 29, 1986</i>					
17. Key Words <i>✓fuel exhaustion; ✓mountainous terrain; transoceanic ferry flight; ✓visual flight (VFR) rules; visual meteorological conditions</i>				18. Distribution Statement <i>This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161</i>	
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National
Transportation
Safety Board

Washington, D.C. 20594

AIRCRAFT ACCIDENT/INCIDENT SUMMARY

File No.: 899
Aircraft Operator: ✓ Brune Air Service, France
Aircraft Type and Registration: ✓ Cessna P210N,
N4906K
Location: International Waters, 36 miles
west of Keflavik, Iceland
Date and Time: January 29, 1986,
1826 Greenwich mean time
Occupants on Board: 1-Pilot and 1-Pilot-rated
Passenger
Injuries: Presumed 2 Fatal
Aircraft Damages: Not Recovered
Other Damage or Injury: None
Type of Occurrence: Fuel Exhaustion
Phase of Operation: Ditching

On January 29, 1986, N4906K, a Cessna P210N, operated by Brune Air Service, France, departed Goose Bay, Labrador, Canada, at 1146 Greenwich mean time (G.m.t.) 1/ on a transoceanic ferry flight to the airport at Narssarssuaq, Greenland. (See figure 1.) Before departing Goose Bay, the pilot of N4960K had obtained a weather briefing from the Goose weather office. He was supplied with forecasts for his destination airport and an alternate airport at Nuuk, Greenland, the wind/temperature forecast, and the significant weather chart 2/ for the north Atlantic. The forecast for Narssarssuaq for the airplane's estimated time of arrival (ETA) was: 1,000 feet scattered, 3,500 feet overcast, visibility-greater than 10 kilometers, and wind--220° at 15 knots, gusting to 25 knots. Temporary conditions (Tempo) 3/ which were forecast for the destination for the time of arrival were for an indefinite ceiling of 800 feet, sky obscured, visibility-1,500 meters, and rain and snow. The forecast for Nuuk/Godthab was: 600 feet overcast, freezing rain, visibility-5,000 meters, and winds-variable at 10 knots. Tempo conditions forecast for Nuuk for the time of arrival were: 400 feet overcast, visibility--800 meters, rain and snow, and wind--160° at 20 knots. Forecast winds at 5,000 feet were 230° at 46 knots for Goose Bay and 150° at 54 knots for Narssarssuaq. The significant weather chart forecast layers of clouds between 2,000 and 20,000 feet along the route of flight between Goose Bay and Narssarssuaq with light to moderate icing between 5,000 and 12,000 feet in the vicinity of Goose Bay and between 10,000 and 20,000 feet in the vicinity of Narssarssuaq. According to the weather briefer at the Goose weather office, the pilot saw a copy of the significant weather chart which had been prepared for another flight, but did not ask for a copy. The weather briefer stated that the pilot was "anxious to go."

A visual flight rules (VFR) flight plan was authorized by Transport Canada for flight at or below 5,500 feet mean sea level (m.s.l.) from Goose Bay to Narssarssuaq. The pilot filed an international VFR flight plan with an estimated time en route (ETE) of 5 hours and a fuel endurance time of 7 hours.

1/ All times appearing herein are G.m.t., based on the 24-hour clock. Coordinated universal time was not yet in effect when this accident occurred.

2/ Significant weather chart: a forecast of significant weather from sea level to flight level (FL) 240 (24,000 feet.)

3/ Tempo.: forecast conditions which are **expected** to last for 1 hour or less.

About 1346, 2 hours after departure, when the pilot estimated that the airplane was 60 miles west of the Prince Christian (OZN) beacon, located on the southern coast of Greenland, he called the flight information center in Sondrestrom, Greenland, on 121.3 MHz.4/ He was advised that the weather at Narssarsuaq (special observation at 1313) was scattered clouds at 1,200 feet, vertical visibility-1,800 feet, visibility--1,500 meters, rain and snow, temperature--2° C, wind--variable between 070° and 130° magnetic at 25 knots, maximum wind speed--36 knots, and minimum wind speed--16 knots. The pilot was subsequently advised that the 1350 surface observation at Narssarsuaq noted scattered clouds at 1,200 feet, broken clouds at 2,000 feet, visibility--5,000 meters, rain, snow, and ice pellets, temperature--1° C, dewpoint--0° C, wind--100° at 27 knots, maximum wind speed--38 knots, and minimum wind speed--17 knots. Runway headings at Narssarsuaq were 080° and 260°. The maximum demonstrated crosswind velocity 5/ of the airplane was 21 knots.

At 1358, the pilot was advised of Sondrestrom SIGMET 6/ No. 1, issued at 1313, which was in effect for moderate to severe icing forecast in the area south of 66° north latitude below FL 130, moving north. At that time, N4906K was about 58° north latitude, 49° west longitude, traveling northeast. The SIGMET was valid from 1330 to 1800 on January 29, 1986, and was based on a pilot report which originated in the vicinity of Nuuk (64° north latitude, 51° west longitude). The pilot also was advised that the 1350 surface observation for Nuuk/Godthab was broken clouds at 600 feet, overcast at 1,200 feet, visibility--1,500 meters, freezing rain and snow, temperature--0° C, dewpoint--0° C, wind--240° magnetic at 18 knots, maximum wind speed--30 knots, and minimum wind speed--8 knots.

Narssarsuaq airport is approved for operations in visual meteorological conditions (VMC) by day only. State (Denmark) minima for VFR for runways 8 and 26 are: ceiling 1,500 feet and ground visibility 8,000 meters. The visual approach chart carries the following caution note:

Unless the ceiling is at least 4,000 feet and the flight visibility at least 5 statute miles (8 KM), pilots without a good knowledge of the local topographical and meteorological conditions are advised not to make any attempt to approach Narssarsuaq through the fiords.

Narssarsuaq is surrounded by mountainous terrain. The approach from the west is through the fiords. Operational Navigational Chart (ONC) D-16 depicts one peak at 4,742 feet above m.s.l. about 22 nautical miles west of the airport.

There are three published instrument approaches for Narssarsuaq: two NDB-DME approaches for runway 8, with a minimum descent altitude (MDA) of 1,500 feet and required ground visibility of 6,000 meters; and one NDB approach for runway 26 with an MDA of 2,400 feet and required ground visibility of 6,000 meters. The approach chart for the NDB approach cautions that the approach should not be attempted if winds exceeds 30 knots.

4/ According to center personnel, an aircraft would have to be at 10,000 feet or higher from the location reported by N4906K for two-way communications on 121.3 MHz.

5/ Maximum demonstrated crosswind capability does not constitute an airplane limitation.

6/ SIGMET: significant meteorological information.

The visibilities at the times of both the 1313 (1,500 meters) and the 1350 (5,000 meters) observations were below those prescribed for either a VFR approach (8,000 meters) or an IFR approach (6,000 meters).

There are three published instrument approaches for Nuuk/Godthab: two **localizer (LLZ)/distance measuring equipment (DME)** approaches for runway 26 with an MDA of 660 feet and required ground visibility of 1,200 meters; and one NDB for runway 26 with an MDA of 800 feet (with two automatic direction finders (ADF)) or 2,140 feet (with one ADF), both requiring ground visibility of 2,500 meters.

The visibility at the time of the 1350 observation at Nuuk/Godthab was 1,500 meters, greater than that required for the LLZ/DME approach. The broken ceiling at 600 feet was below the MDA for the LLZ/DME approach.

At 1433, the pilot advised Sondrestrom that he intended to divert to Reykjavik, Iceland, estimating the OZN beacon at 1447 and Reykjavik at 1717. He estimated that his fuel would be exhausted about 1846. At 1455, the pilot advised Sondrestrom that the airplane was abeam the OZN beacon.

About 1658, the pilot radioed Iceland through a British Caledonian flight that he estimated that the airplane was 150 miles west of Keflavik, Iceland, and that his ETA for Reykjavik should be revised to 1828. Keflavik was located within an area where scattered to broken towering cumulus and cumulonimbus clouds were forecast, with bases between 2,000 and 4,000 feet and tops between 18,000 and 25,000 feet. Forecast winds were 020° at 19 knots.

About 1712, N4906K was identified on radar by Iceland's Air Traffic Control (ATC) Center. At the time, the airplane was 188 miles west of the Keflavik VOR 7/ on the 272° radial. About 1714, the pilot of N4906K indicated that the airplane was low on fuel and, about 1716, he reported that 1 hour of fuel remained. About 1721, the airplane initiated a climb from 5,500 to 15,000 feet after receiving a forecast for winds from 360° at 10 to 15 knots at the higher altitude. The winds at 5,500 were from 360° at 25 to 30 knots according to a transmission from ATC.

Although the pilot did not declare an emergency, the Icelandic Directorate of Civil Aviation initiated search and rescue activities about 1723 on January 29, 1986. United States Air Force (USAF) aircraft and Icelandic ships were directed to the scene to conduct search and rescue operations.

An onscene weather summary prepared by the Icelandic Department of Defense reported winds to be between 28 and 40 knots with ocean swells between 5 and 7 meters and estimated an overcast sky at 900 feet with visibility of 25 miles and wind from 033° at 28 knots gusting to 35 knots.

About 1751, the airplane began to descend from 15,000 feet. About 1811, the fuel aboard N4906K was exhausted, 6.4 hours after departure. During the airplane's descent, the pilot of a USAF C130, which had been launched from Iceland for search and rescue purposes, gave ditching instructions to the pilot of N4906K. The airplane was ditched intact in the Atlantic Ocean about 36 miles west of the Keflavik VOR on the 268° radial about 1826; it was escorted by the C130 which used flares to light up the sea. The light condition at the time was dusky (dark twilight). The ATC transcript suggests that the airplane was ditched successfully. Shortly before touchdown, the C130 pilot said, "You're

7/ VOR: very high frequency omni-range.

looking good." A USAF rescue helicopter arrived about 3 minutes later while **N4906K** was still visible, but there were no signs of the two occupants. Witnesses said they saw a blue aircraft light on **N4906K** about 1829; however, about 1834, rescue personnel lost sight of the airplane. The airplane's emergency locator transmitter (ELT) operated for about 15 minutes after the airplane was ditched.

The search was continued until about 2300 when further activity was impossible due to weather and darkness. On January 29, 1986, the sun was 6° below the horizon (civil twilight) at 1807 and rose above the horizon about 0921. The search, which continued all day on January 30, 1986, was suspended on January 31 due to foul weather, and was concluded on February 1, 1986. The airplane was not recovered, and both the commercially certificated pilot and the pilot-rated passenger are presumed to have died in the accident.-

The Cessna **P210N**, serial No. **P21000361**, which had been manufactured in 1979, was purchased from Tim **McCandless**, Inc, Waverly, Iowa, a few days before the accident. The pressurized airplane was equipped with a turbocharged fuel-injected engine and standard fuel tanks with 90 gallons of fuel (89 usable). The gravity flow fuel system consisted of one vented integral fuel tank in each wing, two reservoir tanks, a three-position selector valve (fuel cannot be used from both tanks simultaneously), auxiliary pump, strainer, enginedriven pump, fuel/air control unit, manifold, and injection nozzles. According to the seller, an annual inspection had been completed by a mechanic with an inspection authorization in preparation for the Federal Aviation Administration (FAA) to issue an export Certificate of Airworthiness (C of A). The inspection had not been signed off because, according to the seller, the pilot was "in a big hurry to leave" and was unwilling to await the arrival of the inspector from the **FAA's** Des Moines, Iowa, office to approve the airworthiness certificate and to issue an export ferry permit. Kentucky Flying Service, Louisville, Kentucky, reported that it had completed an annual inspection of **N4906K** on January 25, 1985, for the previous owner who sold the airplane to Tim **McCandless**, Inc. The airplane was properly licensed as a U.S. registered aircraft at the time of the accident. However, without an export C of A, the flight was illegal as a ferry flight to export the airplane from the United States to France.

N4906K left Waverly and arrived at Goose Bay on January 24, 1986. The airplane was sent to Moncton, New Brunswick, Canada, for inspection. Transport Canada authorities in Moncton refused authorization for the trans-Atlantic flight because the airplane lacked the required emergency equipment. The equipment was not available in Moncton, so the airplane was flown to Montreal, Quebec, Canada, to purchase the required equipment. On January 27, 1986, Transport Canada grounded the airplane in Montreal because the certificate of registration was not available. On January 28, 1986, the confirmation of registration arrived and the transoceanic flight from Goose Bay to Narssarssuaq was authorized for VFR flight only, at or below 5,500 feet **m.s.l.** **N4906K** was not equipped with a high frequency (HF) radio as required for instrument flight rules (IFR) at 6,000 feet **m.s.l.** and higher. It was not determined if a rental HF radio was available.

The pilot/owner of **N4906K** was the owner of Brune Air Service, France. He held FAA commercial pilot certificate No. 87492261 with airplane single and multiengine land and instrument airplane ratings. He had successfully completed a biennial flight review on October 27, 1985. He also held French private pilot license No. 0501000878, which was valid until January 31, 1986. An FAA second class medical certificate was issued to the pilot on July 11, 1985, with the limitation that the holder must wear glasses for near and distant vision while exercising his airman privileges.

The pilot-rated passenger held French private pilot license No. 0109001278 with instrument ratings in single and multiengine airplanes, and with instructor qualification No. ILO1000182. The passenger did not hold any FAA certificates.

According to the Quebec Regional Superintendent of Flight Training Standards for Transport Canada, the pilot had previously flown the trans-Atlantic route and knew that an inspection was required. The regional superintendent said that the pilot had been briefed by Transport Canada on several occasions and had been given a copy of an explanatory bulletin regarding transoceanic crossing procedures. The regional superintendent also said that, because the pilot was so slow in preparing the weight and balance data, he did it for him.

The pilot was forced to ditch the airplane because of fuel exhaustion. Range **calculations** were made for several scenarios. In the first case, the pilot reported that he was low on fuel about 1 hour before the ditching. He then climbed from 5,500 to 15,000 feet. Range calculations indicate that the airplane would have ditched at about the same position even if the pilot had stayed at 5,500 feet. Other calculations indicate that the airplane could have reached Iceland had the entire flight been flown at 10,000 feet, at maximum efficiency, and with about a 40-knot tailwind component. However, the margin for error would have been extremely small. Calculations were made in an attempt to learn if the airplane could have returned to Goose Bay after receiving the 1313 Narssarssuaq special weather observation at 1346, 2 hours after departure. If the airplane had been flown outbound at normal cruise performance, it probably could not have returned to Goose Bay before fuel exhaustion; however, it could have reached the Labrador coast if the return leg was flown efficiently. If the airplane had been flown outbound at near maximum efficiency, an immediate decision to return to Labrador probably would have resulted in the airplane reaching land and possibly reaching Goose Bay. In any event, the airplane should have been able to reach Nuuk/Godthab while in a normal cruise condition, even after reporting abeam the OZN beacon at 1455.

When the pilot reported the airplane's position as 60 mile southwest of the OZN beacon at 1346, it probably was greater than 170 miles to the southwest and, possibly, as far as 220 miles. Additionally, when the pilot reported the airplane's position as 150 miles to the west of Keflavik at 1658, it probably was about 220 miles to the west.

The attached brief of accident contains the Safety Board's conclusions, findings of probable cause, and related factors.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JIM BURNETT
Chair man

/s/ PATRICIA A. GOLDMAN
Vice Chair man

/s/ JOHN K. LAUBER
M e m b e r

/s/ JOSEPH T. NALL
Member

January 22, 1987

National Transportation Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 899 1/29/86 KEFLAUIK ICELND, A/C Reg. No. N4906K Time (Lcl) - 1826 T

----Basic Information----

Type Operating Certificate-NONE (GENERAL AVIATION)	Aircraft Damage	Injuries			
	DESTROYED	Fatal	Serious	Minor	None
Type of Operation -BUSINESS	Fire	Crew	2	0	0
Flight Conducted Under -14 CFR 91	NONE	Pass	0	0	0
Accident Occurred During -LANDING					

----Aircraft Information----

Make/Model - CESSNA P210N	Ens Make/Model - CONTINENTAL TSIO-520	ELT Installed/Activated - YES/YES
Landing Gear - TRICYCLE-RETRACTABLE	Number Engines - 1	Stall Warning System - YES
Max Gross Wt - 4000	Engine Type - RECIF-FUEL INJECTED	
No. of Seats - UNK/NR	Rated Power - 310 HP	

----Environment/Operations Information----

Weather Data	Itinerary	Airport Proximity
Wx Brief in 4 - UNK/NR	Last Departure Point	OFF AIRPORT/STRIP
Method - IN PERSON	GOOSE BAY, CD	
Completeness - FULL	Destination	Airport Data
Basic Weather - VMC	REYKJAVIK	Runway Ident - N/A
Wind Dir/Speed- 033/028 KTS	ATC/Airspace	Runway Lth/Wid - N/A
Visibility - 25.0 SM	Type of Flight Plan - VFR	Runway Surface - N/A
Lowest Sky/Clouds - UNK/NR	Type of Clearance - NONE	Runway Status - N/A
Lowest Ceiling - 900 FT OVERCAST	Type Appch/Lndg - FORCED LANDING	
Obstructions to Vision- NONE		
Precipitation - NONE		
Condition of Light - DUSK		

----Personnel Information----

Pilot-In-Command	Age - 34	Medical Certificate - VALID MEDICAL-WAIVERS/LIMIT
Certificate(s)/Rating(s)	Biennial Flight Review	Flight Time (Hours)
COMMERCIAL	Current - YES	Total - 1650
SE LAND, ME LAND	Months Since - 3	Last 24 Hrs - UNK/NR
	Aircraft Type - UNK/NR	Last 30 Days - UNK/NR
		Last 90 Days - UNK/NR
		Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

----Narrative----

AT 1146 GMT, N4906K DEFTD ON A 5 HR FLT TO NARSSARSSUAQ, GREENLAND WITH AN ESTD 7 HRS OF FUEL. WHEN THE FLT RPRTD 60 MI SW OF GREENLAND, THE DESTN VIS WAS BELOW IFR MIN & THE CEILING AT THE ALTN ARPT WAS BELOW THE MDA. THE PLT ELECTED TO CONT TO REYKJAVIK, ICELAND. LATER, AFTER HE EXTENDED HIS ETA TO REYKJAVIK BY MORE THAN 1 HR & INDICATED LOU FUEL, ICELAND OFFICIALS BGN SEARCH/RESCUE PROCEDURES. USAF & ICELAND ACFT & SHIPS WERE DISPATCHED BFR THE ACFT RAN OUT OF FUEL. AT 1811, FUEL EXHAUSTION OCCURRED AS THE FLT WAS DSCNDG FH 15,000'. A USAF C-130 CREW RENDEZVOUSED WITH N4906K, LIGHTED THE OCEAN WITH FLARES & GAVE DITCHING ADVISE. THE FLT DITCHED IN HI SEAS APRX 36 MI WEST OF KEFLAVIK, ICELAND IN WINDS GUSTING TO 35 KTS, A USAF HELICOPTER ARRIVED 3 MIN LATER, BUT THE OCCUPANTS WERE NEWER OPSVD TO EMERGE FH THE DOWNED ACFT, RESCUE FSNL LOST SIGHT OF THE ACFT AT 1834. AT THAT TIME, THE SUN WAS 6 DEG BLO THE HORIZON. THE ELT SIGNAL CEASED SHORTLY THEREAFTER. THE OCCUPANTS WERE PRESUMED TO HAVE BEEN FATALLY INJURED WHEN THE ACFT DITCHED/SANK IN THE OCEAN.

Brief of Accident (Continued)

File No. - 899

1/29/86

KEFLA'JIK ICELAND,

A/C Reg. No. N4906K

Time (Lcl) - 1826 T

Occurrence #1 LOSS OF POWER(TOTAL) - NON-MECHANICAL
Phase of Operation CRUISE

Findings(s)

1. PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND
 2. FLIGHT INTO KNOWN ADVERSE WEATHER - INITIATED - PILOT IN COMMAND
 3. WEATHER CONDITION - UNFAVORABLE WIND
 4. FLIGHT TO ALTERNATE DESTINATION - ATTEMPTED -
 5. FLUID, FUEL - EXHAUSTION
 6. FUEL SUPPLY - INADEQUATE - PILOT IN COMMAND
-

Occurrence #2 FORCED LANDING
Phase of Operation DESCENT - EMERGENCY

Occurrence #3 DITCHING
Phase of Operation LANDING - FLARE/TOUCHDOWN

Findings(s)

7. LIGHT CONDITION - DUSK
 8. WEATHER CONDITION - HIGH WIND
 9. WEATHER CONDITION - LOW CEILING
 10. TERRAIN CONDITION - WATER, ROUGH
-

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are findings(s) 2,5,6

Factor(s) relating to this accident is/are findings(s) 1,3,7,8,9,10