

FINAL REPORT

HCLJ510-000330	Accident		
Aircraft:	Cirrus SR20	Registration:	N901SR
Engine:	Continental IO-360-ES6	Type of Flight:	Ferry flight, IFR
Crew:	1 – fatal injuries	Passengers:	None
Place:	60 39 56N 46 41 44W, Greenland	Date and Time:	2.2.2007 at 1811 hrs UTC

All times in this report is UTC.

Synopsis

On 2.2.2007 at 1745 hrs, the Area Control Centre at Copenhagen Airport Kastrup (EKCH) notified the Danish Accident Investigation Board (AIB) about a possible emergency with N901SR.

The US National Transportation Safety Board (NTSB) was notified on 2.2.2007 at 2317 hrs. The NTSB designated an accredited representative to the investigation.

The aircraft ditched at a position approximately 3 nm west southwest of SI (Simiutaq) NDB (279 KHz) in Greenland.

The pilot was fatally injured and the aircraft was destroyed. The wreckage was not recovered.

The accident occurred in daylight and under visual meteorological conditions (VMC).

Summary

Based on data gathered from conversations between the accident pilot, Sondrestrom FIC and the other two pilots, the accident aircraft experienced an engine malfunction. Since the aircraft was not recovered, the exact cause to the engine malfunction could not be determined.

No safety recommendations were made during the course of this investigation.

1. Factual information

1.1 History of flight

The flight, during which the accident occurred, was part of a ferry flight of three aircraft (Cirrus SR20) from the United States to Thailand.

At 1405 hrs, the aircraft departed from Goose Bay Airport (CYJR) in Canada with planned destination Reykjavik Airport (BIRK) in Iceland. Estimated enroute time was 10 hours and 30 minutes. ATC filed cruising level was FL 130. At 1647 hrs (position 58N 050W), the pilot of N901SR made a position report stating that the aircraft was cruising at FL 150 and estimating OZN (Prins Christian Sund) NDB (372 KHz) at 1821 hrs.

After passage of the position 58N 50W, the pilots of the three aircraft got a weather briefing for BIRK. Due to deteriorating weather conditions at BIRK, the pilots decided to divert to Narsarsuaq (BGBW).

Approximately 80 nm southwest of SI NDB, the pilot of N901SR reported to the two other pilots that there was an indication of fluctuating engine oil pressure. But the oil temperature was not increasing and the engine sounded normal, so the pilots agreed that it might be an indication failure. The three aircraft continued towards SI NDB.

A short while later, the pilot of N901SR reported to the two other pilots that the oil temperature suddenly increased to 220°C and then went back to the previous temperature of 150°C. The pilot of N901SR decided to advise Sondrestrom FIC.

At 1729 hrs, the pilot of N901SR advised Sondrestrom FIC that he might have to declare an emergency due to low oil pressure, but for the time being the oil pressure had stabilized.

At 1732 hrs, Sondrestrom FIC notified Sondrestrom Rescue Coordination Centre (RCC).

At 1740 hrs, the pilot of N901SR advised Sondrestrom FIC that it might be an indication problem and it did not seem to be an engine problem.

At 1749 hrs, the pilot of N901SR declared an emergency and on request from Sondrestrom FIC, he reported his position to be approximately 50 nm southwest of SI NDB at 59 58 N 047 18W.

At 1750 hrs, Sondrestrom FIC notified Sondrestrom Rescue Coordination Centre (RCC). A search and rescue mission was initiated.

From the time the emergency was declared, positions and status of the aircraft were transmitted blind to Sondrestrom FIC from one of the other pilots.

The pilot of N901SR reported to the two other pilots that he had started a gliding (IAS approximately 87 knots) descent. At approximately 9000 feet, the aircraft was in IMC. During the descent, the pilot of N901SR reported to the two other pilots of the formation that there was oil on the windshield.

At 1753 hrs, the pilot of N901SR reported that the engine had stopped. In the same minute, he reported that the power came back on the engine (only getting 500 RPM). But there was smoke in the cockpit and the pilot reported that it might be a possible fire.

Throughout the sequence of events, continuous position reports were transmitted to Sondrestrom FIC.

At 1800 hrs, the pilot of N901SR reported that he was getting ready to ditch and that he was putting on his survival suit.

About 800 feet AGL (reported by the pilot of N901SR to the other two pilots), the aircraft broke out of clouds and the pilot reported that he had land insight. At 1810 hrs, a helicopter (AS350) departed from Qaqortoq Airport (BGJH).

Approximately at 1811 hrs, the aircraft ditched.

At 1814 hrs, the last position of N901SR reported by one of the other pilots was 60 38N 46 41 W.

At 1818 hrs, a helicopter (S61) departed from BGBW.

The two other Cirrus SR20 aircraft stayed in the area searching for N901SR. At 1908 hrs, the wreckage was located by one of the other Cirrus SR20 pilots. At 1911 hrs, the body of the pilot was located. At 1950 hrs, the flight crew of the S61 observed a deployment of the Cirrus Airframe Parachute System (CAPS) (N901SR).

At 2036 hrs, the body of the pilot was recovered from the water.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	1	-	-
Serious	-	-	-
Minor/None	-	-	-

1.3 Damage to aircraft.

The aircraft was destroyed.

1.4 Other damage

There were no other damages.

1.5 Personnel information

The pilot, male, 49 years, was in possession of a valid US CPL (Commercial Pilot License) and had a valid Medical Certificate Second Class.

Total flying experience was approximately 10200 hours of which approximately 300 hours were obtained in Cirrus SR20 aircraft. Since 1995, the pilot had performed ferry flying making several cross Atlantic ferry flights each year.

1.6 Aircraft information

1.6.1 General aircraft information.

Manufacturer:	Cirrus Design Corp.
Type:	SR20
Year of Manufacture:	2006
Serial Number:	1761
Certificate of Airworthiness:	Issued 18 December, 2006
Engine:	Continental IO-360-ES6
Propeller:	Hartzell BHC-J2YF-1BF/F7694
Special emergency equipment:	Cirrus Airframe Parachute System (CAPS)

1.6.2 Pilot Operating Handbook (POH) – section 2 (limitations) (extract).

1.6.2.1 Altitude limit.

“The operating rules (FAR Part 91 and FAR 135) require the use of supplemental oxygen at specified altitudes below the maximum operating altitude.

1.6.2.2 Environmental conditions.

“For operation of the airplane below an outside air temperature of -10°F (-23°C), use of cowl inlet covers approved by Cirrus Design and listed in the Winterization Kit AFM Supplement P/N 11934-S25 is required.”

1.6.3 Service Bulletins (SB).

1.6.3.1 Service Bulletin SB 2X-71-04 R4.

“Winterization Kit

As an option, owners whose flight conditions achieve ambient temperatures below 32°F (0°C) are encouraged to install the Winterization Kit. This kit provides inlet covers that allow the engine to reach and maintain optimal CHT (Cylinder Head Temperatures) and Oil temperature.”

1.6.3.2 Service Bulletin SB 2X-71-10.

“Engine drains Oil breather Line Insulation Sleeve Installation.

During extremely cold weather operations, inadequate preheating of the engine may cause moisture in the oil breather line to freeze which could result in high engine oil pressure, improper engine venting, and possible loss of engine oil. To correct this condition, an insulation sleeve may be installed over the oil breather line.”

1.6.4 AFM section 3 – emergency procedures (ditching).

- “1 Radio *Transmit (121.5 MHz) MAYDAY giving location and intentions*
- 2 Transponder *SQUAWK 7700*
- 3 CAPS *ACTIVATE If available, life preservers should be donned and life rafts should be prepared for immediate evacuation upon touchdown. Consider unlatching a door prior to assuming the emergency landing body position in order to provide a ready escape path.*
- 4 Airplane *EVACUATE It may be necessary to allow some cabin flooding to equalize pressure on the doors. If the doors cannot be opened, break out the windows with the egress hammer and crawl through the opening.*
- 5 Flotation Devices. *INFLATE WHEN CLEAR OF AIRPLANE*

1.7 Meteorological information

1.7.1 TAF.

BGBW 021700Z 021823 08008KT 9999 –SHRA BKN035 TEMPO 1823 VRB08KT SCT040 BKN120=

1.7.2 METAR.

BGBW 022050Z 10001KT 9999 SCT040 BKN045 M09/M013 Q1000 RMK 3SC 5SC=

BGJH 022150Z AUTO 27006KT 250V310 //// // M04/M08 Q1001=

BGJH 022220Z AUTO 28008KT 240V320 //// // M03/M08 Q1002=

1.7.3 Altitude temperatures (temps in deg C).

RED : Measured on 2 February at 2300 hrs.

BLACK: Estimated.

Flight level	CYYR T/Dp (° C)	Accident area airtemp. (° C)	BGBW T/Dp (° C)
020	-10/-12	-7	-9/-15
050	-14/-19	-13	-14/-26
070	-16/-21	-17	-17/-18
100	-21/-23	-25	-24/-37
120	-23/-25	-28	-28/-36
150	-25/-45	-35	-36/-39
180	-31/-36	-42	-43/-46
200	-33/-38	-43	-44/-48

1.7.4 Weather chart.

See enclosure no 1.

1.8 Aids to navigation

Simiutaq NDB SI 279 KHz H24 60 40 54N Coverage 100 nm
046 35 46W

1.9 Communications

Recordings of RTF communications were obtained. The recordings were of good quality and useful to the investigation.

1.10 Aerodrome information

Narsarsuaq Airport: BGBW
Position (ARP): 61 09 38.59N 045 25 32.43W
Elevation: 112 FT
MAG VAR: 29.8° W (SEP 1999)
Designation: NARSARSUAQ TIZ
Airspace classification: G
ATS unit call sign: NARSARSUAQ AFIS
RWY: 07 and 25
Sunrise (SR) and sunset(SS): SR 1120 hrs and SS 1912 hrs

No radar coverage was established in the area.

1.11 Flight recorders

Flight recorders were neither installed nor required.

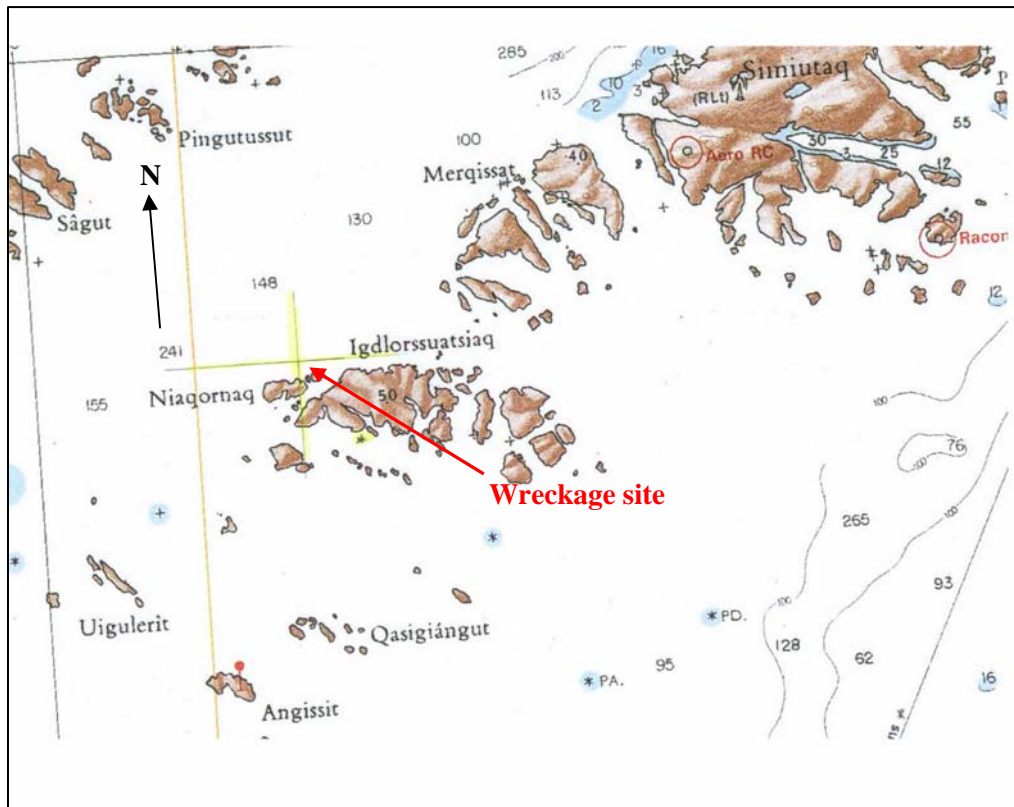
1.12 Wreckage and impact information

1.12.1 Position of wreckage and sea salvage.

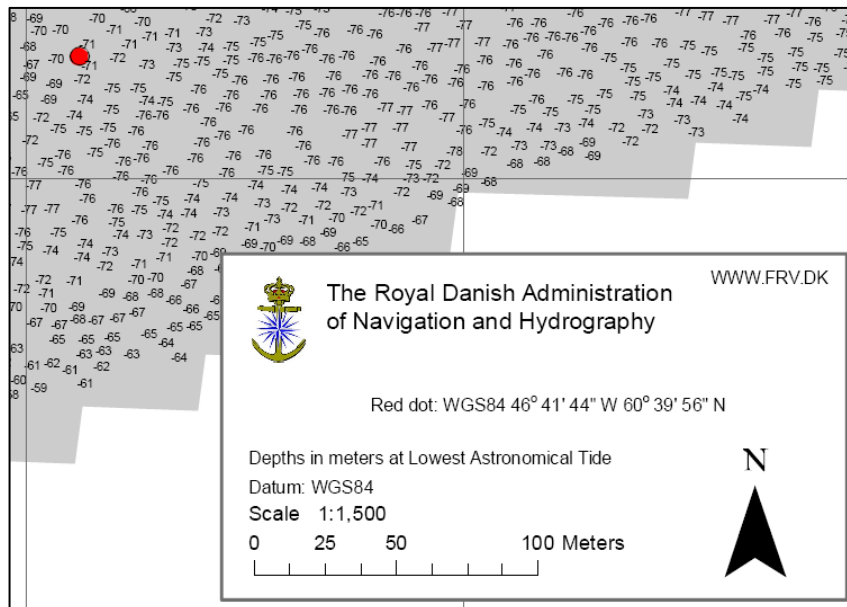
The aircraft ditched and sank at a position approximately 3 nm west southwest (60 39 940N 46 41 740W) of SI NDB. In January 2008, the Danish AIB without success tried to salvage the wreckage.

Arriving at the accident site, the flight crew of the S61 observed that the tail of N901SR was broken and bent approximately 45° to the left and that the left entrance door floated nearby. There were no observations of a dinghy in the water.

1.12.2 Wreckage site.



1.12.3 Depth in meters at the wreckage site.



1.12.4 Cowl inlet covers and oil breather line insulation sleeve installation.

On 15 February 2007, an inspection of the two other Cirrus SR20 aircraft was made in BGBW. The two aircraft were similar equipped as N901SR.

The inspection revealed that with reference to Service Bulletin SB 2X-71-04 R4, Service Bulletin SB 2X-71-10 and the Winterization Kit AFM Supplement P/N 11934-S25, neither cowl inlet covers nor the oil breather line insulation sleeve were mounted.





1.12.5 Supplemental oxygen.

The inspection revealed that no supplemental oxygen system was carried on board the aircraft of the formation.

1.13 Medical and pathological information

There was no indication that incapacitation or physiological factors affected the performance of the pilot.

The autopsy report stated that the cause of death assumed to be drowning in combination with hypothermia.

1.14 Fire

Even though, the pilot of N901SR reported that he had smoke in the cockpit, the Danish AIB was not able to determine whether or not a fire had been present since the wreckage was not recovered.

1.15 Survival aspects

1.15.1 On board survival equipment.

There was a dinghy onboard the aircraft. The pilot wore a one layer non-insulated dry suit without flotation capability.



1.15.2 Search and rescue.

1.15.2.1 At 1732 hrs, Sondrestrom FIC notified Sondrestrom RCC and once again at 1750 hrs, Sondrestrom FIC notified Sondrestrom RCC in order to initiate a search and rescue mission. At 1810 hrs, a helicopter (AS350) departed from Qaqortoq Airport (BGJH) and at 1818 hrs, a helicopter (S61) departed from BGBW. At 1826 hrs, the AS350 arrived at the position 60 36N 046 41W tracking inbound SI NDB. At 1840 hrs, the S61 arrived at the accident area.

1.15.2.2 At 1908 hrs, the wreckage was located in an upright position and the body of the pilot was lying with his face down in the water.

1.15.3 Emergency Locator Transmitter (ELT).

The aircraft was equipped with an ACK technologies model E-01 ELT. The ELT was fixed mounted and was capable of transmitting on 121.500 MHz and 243.000 MHz. No COSPAS/SARSAT messages were received by Sondrestrom RCC.

Location accuracy on 121.5 and 243 MHz ELT is normally better than 20 kilometres when an ELT is positioned for the first time and the accuracy improves with additional positioning to within a few kilometres. The accuracy on 406 MHz ELT is better than five kilometres at the first positioning and improves with additional positioning to within one kilometre.

1.16 Test and reseach

No specific test or research was conducted.

1.17 Organisational and management information

Not applicable.

1.18 Additional information

Federal Aviation Regulations (FAR) – Part 91 versus 135 operating requirements.

Part 91.211: Use of oxygen

“(a) Unpressurized aircraft. Each pilot of an unpressurized aircraft shall use oxygen continuously when flying—

(1) At altitudes above 12,500 feet up to 14000 feet MSL for that part of the flight at those altitudes that is of more than 30 minutes duration; and

(2) Above 14,000 feet MSL.”

1.19 Useful or effective investigation techniques

No new special effective investigation techniques were used.

2. Analysis

2.1 General.

The ATC filed FL from CYYR to BIRK was FL 130. At a certain time of the flight, N901SR was cruising at FL 150. From a human performance point of view and in general, the Danish AIB finds it hazardous to plan and fly long haul flights at altitudes above 12000 feet without use of supplemental oxygen. Though the human body at altitudes between 10000 and 15000 feet (hypoxia compensatory stage) try to provide protection against hypoxia by increasing the respiratory volume, the cardiac output and blood pressure, the effects of hypoxia on the central nervous system are perceptible causing:

- Drowsiness
- Decreased judgement and memory
- Difficulty in performing tasks requiring mental alertness or very small movements.

To what extent, if any, the performance and alertness of the pilot in this accident was degraded is unknown. However, the Danish AIB would like to emphasize that the risk of hypoxia is present even at

altitudes between 10000 and 15000 feet. Hypoxia might influence the pilot decision-making and thereby the overall events.

2.2 The flight inbounds BGBW.

2.2.1 Technical status.

During the flight from CYJR until the time of the declared emergency, the aircraft was operating in an environment with low temperatures. The average temperature was between -26°C (FL 120) and -30°C (FL 150). The aircraft manufacturer had issued two SBs for the Cirrus 20SR. The first SB encouraged the operator to install an engine air intake winterization kit if the aircraft operated at temperatures below 0° C. According to the Cirrus 20SR POH this winterization kit was required when operating at temperatures below -23°C. Throughout the flight, the aircraft was cruising at a FL with an outside air temperature below - 23°C. The second SB was issued because inadequate preheating of the engine in extremely cold weather operations might cause moisture in the oil breather line to freeze which could result in high engine oil pressure, improper engine venting, and possible loss of engine oil.

The technical status of N901SR was not in compliance with the above-mentioned SB recommendations and the POH requirement.

During the sequence of events, the pilot reported fluctuating oil pressure and oil temperature, oil on the windshield, smoke and smell of carbon in the cockpit. However, due to the location of ditching of N901SR, the aircraft was not recovered. Since the aircraft was not recovered and the engine could not be examined, the cause of the reported pilot engine problems could not be verified.

2.2.2 Emergency procedures.

Before ditching, the pilot did not deploy the CAPS. Since the pilot had land insight, he probably aimed to increase the gliding distance and keep aircraft manoeuvring controllability.

2.3 Search & rescue and survivability.

2.3.1 General.

Operating in an arctic environment on extended flights over water with single-engine aircraft is risky and requires careful pre-flight planning and appropriate aircraft equipment. Adverse weather conditions and flying over areas of no radar coverage make a rescue mission difficult and more time consuming. For that reason, a lack of appropriate survival equipment might be fatal to survivors of an aircraft accident.

2.3.2 The accident flight.

Before N901SR ditched, a rescue mission was initiated. Approximately 15 minutes after N901SR had ditched, the first helicopter arrived at the accident area. Searching for the wreckage took approximately 42 minutes.

The fixed mounted ELT capable of transmitting on 121.5 MHz and 243 MHz most likely due to the impact in water never started or instantaneously stopped transmitting when the aircraft ditched. For that reason, no COSPAS/SARSAT messages were received by Sondrestrom RCC.

It is the opinion of the Danish AIB that an installation of a 406 MHz automatic deployable ELT most likely would have reduced the time of search and thereby increased the chances of survivability.

The pilot wore a one layer non-insulated dry suit without flotation capability. Due to the lack of a proper immersion suit providing insulation and flotation, the Danish AIB finds that the body of the pilot probably was exposed to a hypothermia shock (water temperature at or below 2°C), which led to unconsciousness and drowning.

3. Conclusion

3.1 Findings.

1. The pilot was properly licensed.
2. The pilot was an experienced ferry pilot.
3. Engine cowl inlet covers were not installed.
4. Engine oil breather line insulation was not mounted.
5. No supplemental oxygen system was carried on board the aircraft.
6. The aircraft was equipped with an ACK technologies model E-01 ELT.
7. The ELT was fixed mounted and was capable of transmitting on 121.500 MHz and 243.000 MHz.
8. There was a dinghy onboard the aircraft.
9. The ATC filed FL from CYYR to BIRK was FL 130.
10. Estimated enroute time was 10 hours and 30 minutes.
11. Throughout the flight, the aircraft was cruising at a FL with an outside air temperature below -23°C.
12. Due to deterioration in weather in BIRK, the formation diverted to BGBW.
13. During the sequence of events, the pilot reported fluctuating oil pressure and temperature, oil on the windshield, smoke and smell of carbon in the cockpit.
14. The engine stopped and the aircraft started a gliding decent towards SI NDB.
15. The pilot did not deploy the CAPS.
16. Before the aircraft ditched, a rescue mission was initiated.
17. At 1811 hrs, the aircraft ditched at a position approximately 3 nm west southwest of SI NDB.
18. No radar coverage was established in the area.
19. The pilot wore a one layer non-insulated dry suit without flotation capability.
20. No COSPAS/SARSAT messages were received by Sondrestrom RCC.
21. At 1826 hrs, an AS350 arrived at the position 60 36N 046 41W tracking inbound SI NDB.
22. At 1840 hrs, a S61 arrived at the accident area.
23. At 1908 hrs, the wreckage was located in an upright position and the body of the pilot was lying with his face down in the water.
24. The body of the pilot was probably exposed to a hypothermia shock (water temperature at or below 2°C), which led to unconsciousness and drowning.

3.2 Causal factor.

Due to the unsuccessful salvage of the wreckage and the lack of an engine examination, the causal factor to the engine malfunction could not be determined.

3.3 Summary.

Based on data gathered from conversations between the accident pilot, Sondrestrom FIC and the other two pilots, the accident aircraft experienced an engine malfunction. Since the aircraft was not recovered, the exact cause to the engine malfunction could not be determined.

4. Recommendations

No safety recommendations were made during the course of this investigation.

5. Enclosures

1. Significant weather chart, Greenland.

Enclosure 1

