Aircraft Accident Investigation Board, Norway HSL

# REPORT

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REP.: 61/2000
Date: 2 October 2000

All times given in this report is local time (UTC + 2 hours), if not otherwise stated.

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| Aircraft | |
| -type & reg.: | Cessna C182Q serial no. 18267637 IFR equipped/ D-EPEE |
| -year of man.: | 1980 Total time 20 November 1998 1 592 hrs |
| -engine: | Continental O – 470 – U serial no. 467096. Time Since Overhaul 20 November 1998 195 hrs. Propeller Time Since New 20 November 1998 71 hrs. |
| Date and time: | 11 August 1999 between 18:42 hrs and 18:51 hrs |
| Location: | Reinøya, Finnmark, Norway 70°52,056' N 024°13,714' E |
| Type of occurrence: | Accident, flight into terrain |
| Type of flight: | Private |
| Weather cond.: | General weather situation - low cloud ceiling and low visibility, fog patches |
| Light cond.: | Daylight |
| Flight cond.: | Probably Instrument Meteorological Conditions (IMC) at the accident site |
| Flight plan: | VFR |
| No. of persons onb. : | 2 |
| Injuries: | Fatal |
| Aircraft damage: | Destroyed, most of the wreckage consumed by fire after impact |
| Commander | |
| -sex: | Male |
| -age: | 65 |
| -licence: | Private Pilot Licence, valid until 25 June 2000. No IFR-rating. Last medical check 16 June 1998 |
| -fl. experience: | Flight time on C-182 unknown. Total time 2 325 hrs as of 15 June 1998 |
| Information sources: | Police & Insurance records, ATC & Wx reports, Bundesstelle für Flugunfalluntersuchung (BFU), Germany, AAIB/N own investigation. |

## FACTUAL INFORMATION

Due to the fact that aircraft and personal information was consumed by fire after impact, BFU has been asked to assist AAIB/N in restoring lost information.

## History of the flight

The Pilot-in-Command (PiC) and his passenger were on a recreational tour in Norway. They had had a night stopover in Tromsø airport (ENTC) and on this day (11 August) they were about to carry out the next flight leg to Honningsvåg airport (ENHV) via North Cape. At about 14:00 hrs they visited the meteorological (met.) office at ENTC. After a study of the relevant weather information and a 10 minutes telephone conference with the forecaster at the main meteorological office in Tromsø City, the PiC decided to postpone the flight in case the weather situation should improve. At 16:20 hrs they returned to the met. office at the airport and received the latest weather information from the met. head clerk. After a new telephone conference with the forecaster, who advised them to postpone the flight to the next day due to a more favourable forecast, they decided to make an attempt after all. The forecaster briefed them that a frontal zone with low clouds, rain and drizzle extended north south over Finnmark. At the coast the front was situated around the North Cape and was moving slowly eastward. In the vicinity of Hammerfest airport (ENHF) the cloud base was about 800 ft, at some places below 500 ft. The airport reported wind from the west at 10 kt gusting 21 kt. East of the frontal zone including ENHV the cloud base was 4 000 ft to 6 000 ft and the visibility was more than 10 km. It was pointed out to them that there were some low clouds and at places also fog patches. It is the opinion of the met. head clerk that the fair weather at ENHV became the decisive factor for the PiC to initiate the flight. She also noted that the two Germans seemed to be in no especial hurry to leave and that their knowledge about weather and weather charts was satisfactory.

“IGA Prog (International General Aviation Prognosis) valid 110600 – 111800 UTC Aug 99 Bodø (ENBD) FIR Part 2: Troms, Finnmark coastal and fjord districts: Wind surface to flight level 070: Variable 05 – 15 kt, Weather: Rain and drizzle. Locally fog, mainly nil east part, Visibility: Locally 0.5 – 6 km in weather elsewhere +10 km, Clouds: Scattered/ broken 1 500 – 4 000 ft, locally broken 0200 – 1 500 ft mainly west part, 0-Isotherm: 4 000 ft – FL 070 highest east part, Ice: Locally moderate associated with weather, Turbulence: Feeble/ Nil.”

“IGA Prog valid 111500 – 112400 UTC Aug 99 ENBD FIR Part 2: Finnmark coastal and fjord districts, Finnmarksvidda: Wind surface to 2 000 ft: Variable 10 kt, Wind at FL 070 Variable 10 – 15 kt, east part 180 15 – 25 kt, Weather: Rain and drizzle, locally fog; mainly nil east part, Visibility: Locally 0.5 – 8 km in weather, elsewhere +10 km, Clouds: Broken/ overcast 1 500 – 4 000 ft, locally broken 0200 – 1 500 ft mainly west part, 0-Isotherm: FL 050 – 080 highest east part, Ice: Locally moderate, Turbulence: Feeble/ Nil, Outlook for tomorrow: Wind variable 10 kt, rain, weakening west part.”

Terminal Aerodrome Forecast (TAF): “Hammerfest 111218 UTC: Wind variable 05 kt visibility +10 km light rain, clouds few at 500 ft broken at 1 500 ft, Temporarily 1218 visibility 500 meters in fog vertical visibility 200 ft.”

Meteorological Aerodrome Report (METAR):

“Hasvik (ENHK) 111250 UTC: Wind 310 10 kt, visibility +10 km, rain, clouds scattered at 500 ft - broken at 1 500 ft - broken at 2 000 ft, temperature 09, dew point 09, QNH 1013.

Hammerfest 111250 UTC: Wind 220 04 kt – varying 190 to 270, visibility +10 km, clouds scattered 700 ft – broken 1 000 ft, temperature 09, dew point 09 QNH 1012.

Honningsvåg 111250 UTC: Wind 150 05 kt, visibility +10 km, clouds scattered 4 500 ft – broken 6 000 ft, temperature 13, dew point 11, QNH 1011.”

The last METAR-list the PiC got:

“Hammerfest 111350 UTC: Wind 250 05 kt varying 220 to 290, visibility to the north 1 000 meters +10 km to the south west, clouds few 300 ft – scattered 700 ft – broken 1 000 ft, temperature 09, dew point 09, QNH 1012.

Honningsvåg 111350 UTC: Wind 000 00 kt, visibility +10 km, light drizzle, Clouds scattered 4 000 ft – broken 6 000 ft, temperature 13, dew point 12, QNH 1011.”

The PiC filed a VFR flight plan for ENHV via ENHK and ENHF, estimated flight time 1:20 hrs, endurance 6:00 hrs, filing ENHF and ENHK as alternate 1 and 2 respectively. Then the head clerk faxed the flight plan to the ENTC ATC (Air Traffic Control) tower. When the ATC approved the flight plan the head clerk was asked to communicate to the PiC that it was no shame involved in returning. This was done. Then the PiC and his passenger left the met. office to refuel the aircraft.

At 17:31 hrs the D-EPEE departed ENTC and set course to the north east. A video tape salvaged from the wreckage area show two short recordings of the landscape about 20 and 25 minutes into the flight. The recordings show that the flight visibility was good and that there was an overcast estimated at about 2 500 ft to about 1 750 ft (2. recording) due to mountain tops being concealed. En route the flight was in contact with Bodø ATCC (Air Traffic Control Centre), ENHK and ENHF. There was nothing unusual reported. At 18:29 hrs when D-EPEE made radio contact with ENHF the following was recorded:

“18:29 hrs

D-EPEE: Hammerfest information D-EPEE

ENHF: D-EPEE Hammerfest Information. Good afternoon. Go ahead.

D-EPEE: Good afternoon. D-EPEE. Cessna 182 coming from Tromsø in 500 feet. Transponder 4771. 5 miles south west of your field but we will go further to the north to Echo November Hotel Victor.

ENHF: DEE – Roger. No known local traffic. (A double transmission – on another frequency.) Stand by a second.

D-EPEE: PE.

ENHF: DEE. No local traffic. Wind is around 300 8 knots max 20 knots in the area. We have rain and cloud base around 700 feet. Visibility around 4 to 5 kilometres. Temperature plus 8 and QNH Hammerfest 1013.

18:30
D-EPEE: You have the QNH 1013.

18:31:10
D-EPEE: Field now the right side in sight but we go further to the north.

ENHF: DEE. Roger.

18:34
ENHF: DEE. Do you want the latest Honningsvåg – weather in ENHV?

D-EPEE: Say again about ENHV.

ENHF: I have the weather report for ENHV if you like.

D-EPEE You will give us over to ENHV?

ENHF Negative. I have the weather for Honningsvåg. The wind is calm. Visibility 10 kilometres and more in rain. Few at 1 000, scattered 4 000 and broken around 6 000. Temperature 12 and QNH 1012 at Honningsvåg airport.

D-EPEE I have the QNH on ENHV is 1012.

ENHF That's correct, and nice weather.

(ENHV calls ENHF asking about an estimated time of arrival for D-EPEE at Honninsvåg.)

ENHF: DEE, do you have any estimate for Honningsvåg?

D-EPEE: Estimate time. No.

ENHF: OK, but you are passing my field now?

18:34:58
D-EPEE: Passing the beacon this time. (Forsøl - Non Directional Beacon – FOR)

ENHF: Roger.

(In a communication between ENHV and ENHF the two units concluded that D-EPEE probably would arrive ENHV 3 minutes past the hour.)

18:39:40
ENHF DEE next frequency is Honningsvåg 119.8. Inform switching.

D-EPEE: Frequency 119.8 Honningsvåg. Will switch now.

ENHF: Roger. So long: Have a nice day.

D-EPEE: Yea."

This was the last communication with D-EPEE.

About 18:30 hrs a senior pilot from a regional airline positioned on the shoreline south of threshold runway 05 at ENHF, observed a C-172 or C-185 on a northerly course about a kilometre away as if the aircraft was on a right base to runway 05. However, the aircraft crossed the centreline and continued north at an altitude of 300 – 400 ft i.e. just a little bit higher than the airport altitude. It looked like the aircraft was following the coastline. The pilot estimated the weather at this time to be poor visibility, 2 – 3 km in drizzle and low stratus clouds with fog patches down to sea level.

The aircraft was not observed from the airport tower.

At 18:51 hrs ENHV called ENHF being slightly worried because an attempt to establish contact with D-EPEE had been unsuccessful. The radio communication coverage is good to the west. From 19:09 hrs ENHV made numerous attempts to get in contact with DEPEE without success. At 19:30 hrs the Rescue Co-ordination Centre for Northern Norway was notified and a major search operation was started. The operation was hampered by poor visibility in fog and rain or low clouds.

The next morning at about 05:30 hrs a helicopter from the Coastguard ship 'Senja' spotted the wreckage of D-EPEE at Reinøya. Both the occupants were found fatally injured and the wreckage was burned out.

The aircraft was equipped with a Garmin 150 GPS (Global Positioning System). The video tape with recordings from the flights in Norway show that the GPS was utilised for navigation even in good weather. The mounted GPS was completely destroyed by the fire. However, a handheld GPS MAP 195 was also found on the accident site. On behalf of AAIB/N BFU made a thorough examination of the unit with the object of retrieving data regarding the track D-EPEE had followed until impact. However, corrosion had damaged the printed circuit board in such a way that no meaningful data could be retrieved.

Passing ENHF the PiC probably utilised the ADF to determine the aircraft position in relation to the NDB Forsøl.

The Aeronautical Chart – ICAO 1: 500 000 "Kirkenes" was saved from the accident site. The chart was prepared with a pencil line through the Sørøysund overhead ENHV direct to North Cape and with distance to go marks every 20 NM. An additional pencil line indicated a coastwise track to go north of ENHF around Kvaløya. Altitudes are in feet indicated by

contour lines and hypsometric tints (higher terrain darker colour). The mountain Burstadfjell 1555 ft was directly on the drawn track. Reinøya is also on the chart two nautical miles (NM) to the left of the track. The island has one contour line, is light coloured and does not appear to be a threat to flying compared to Burstadfjell.

The accident site was on a fairly flat area on top of the island Reinøya at a height of about 100 m. In the true direction of flight 342° at impact the terrain inclined 5° upward and in the opposite direction inclined 2°, also upward. The area was mainly rock covered with a thin layer of soil and wet moss. It was 57 m between the first impact and where the main wreckage had come to a rest. The first impact marks indicated that the aircraft had hit hard and fairly flat with the landing gear and with the right wing somewhat low. Thereafter the underside of the nose had slammed into the ground. The right main wheel had contact marks on the inside. The right wing tip, a light-weight construction, had separated from the wing in a downward direction and had no marks indicating that it had been in touch with the ground. From the impact point the aircraft bounced about 40 m before the wreckage again left a significant mark on the ground. Both wings had been broken off the fuselage. The right wing came to a rest with the fuselage while the left wing had stopped about 10 m earlier. The propeller was found by itself in front of the left wing and had witness marks of rotation under power at impact. The engine was also found by itself close to the main wreckage.

A brief inspection made of the engine at the accident site showed the spark plugs to be in a very good condition. The engine oil had newly been changed. The oil sump was removed and the following examination showed the interior to be in a very good condition. The left flap was loose but the jack indicated that the flap was selected up at impact. The flight control cables were connected and pulleys were OK in the left wing. The root of the wing was burnt because the fuel had escaped the tank and ignited. Ignited fuel from the right wing had caused a rather intense fire that had consumed the wing and the aircraft body including the tail. It was, however, possible to ensure the condition and the attachments of most of the flight control cables to be satisfactory in spite of the impact and fire damage.

The autopsy showed that the fire started after the two persons onboard had been fatally injured. The injuries corresponded to the impact forces.

When the flight had left the ENTC Control Zone the rest of the flight had been conducted in class G airspace requiring the flight to be conducted clear of clouds and with a minimum flight visibility of 3 km (aircraft flying speed 140 kt or less and height above the ground 1 000 ft or less).

## THE AAIB/N COMMENTS AND ANALYSIS

Before the flight started from ENTC the PiC made an effort to get a thorough met briefing. It is the opinion of the Board that he showed good airmanship by postponing his flight and return later for another briefing. When he returned he was made aware of the frontal zone in the North Cape area and advised more than once to postpone the flight or at least turn back, but decided to make a try anyhow probably due to the more favourable weather conditions at ENHV. As the flight progressed north-eastward the weather became worse as could be expected according to the met. briefing. When they passed ENHF the weather was still

above minimum requirements but marginally. They had the runway in sight and could have discontinued the flight. However, it is a well-known fact that it is more difficult to stop or return once airborne. Anyway the PiC did continue the flight. The Board would like to point out that it is hazardous to continue a VFR flight over Norwegian territory in weather conditions of low clouds and poor visibility. The reported weather at ENHV was still satisfactory, but it is the opinion of the Board that it would be reasonable to expect the weather to deteriorate even more since they were still quite a distance away from the frontal zone. The flight was continued around the Kvaløya to the vicinity of the NDB Forsøl and then the course was set towards North Cape again. Due to the mounted GPS it was probably quite easy to keep track of the position at all times. Flying at an altitude probably lower than 500 ft the mountain Burstadfjell 1 555 ft on track to North Cape had to be avoided. The only sensible way to pass this mountain was north of it. Based on the 342° true track at impact on Reinøya that was probably what the PiC did. If he had diverted to the north-west before reaching the coastline by the mountain he would have avoided the island. It is therefore reasonable to believe that he tried to pass between Reinøya and Burstadfjell, could not get through and diverted left to the north - the sensible way to avoid the high terrain to the south. The PiC then probably descended to get below the weather and may have lost his visual cues. The impact marks indicate an aircraft approaching the ground with a high rate of descent. Since the aircraft hit quite flat it is conceivable that the PiC saw the ground and managed to lift the nose of the aircraft, but did not have enough altitude to stop the descent in due time. It is the opinion of the Board that the high impact force is more than anything indicated by the way the right wing tip parted from the wing.

The examination of what was left of the aircraft indicated a well maintained aircraft in a generally good condition and revealed no technical matters that could have caused problems. It is therefore less likely that a technical discrepancy was a factor. Induction icing cannot be excluded, but the damage to the propeller showed that the engine was delivering power at impact. The Board also concludes that the fire started after impact based on the results of the autopsy and the technical examination.

As for the time aspect of the flight they passed around Forsøl NDB 18:35 hrs and checked out with ENHF five minutes later. At that time they must have been close to Burstadfjell, but at least two minutes away from the accident site. Since they did not answer the call from ENHV at 18:51 hrs the Board concludes that the accident probably happened some time between 18:42 hrs and 18:51 hrs.

The Board concludes that the main factors influencing the PiC’s decisions and thereby the course of events were the deteriorating weather conditions combined with the terrain at the coast. In addition the Board has seen a tendency for some pilots to more easily accept flying in marginal weather since the GPS was introduced to general aviation. The accuracy of this navigation system gives them the confidence that they will manage to find their destination.

## RECOMMENDATIONS

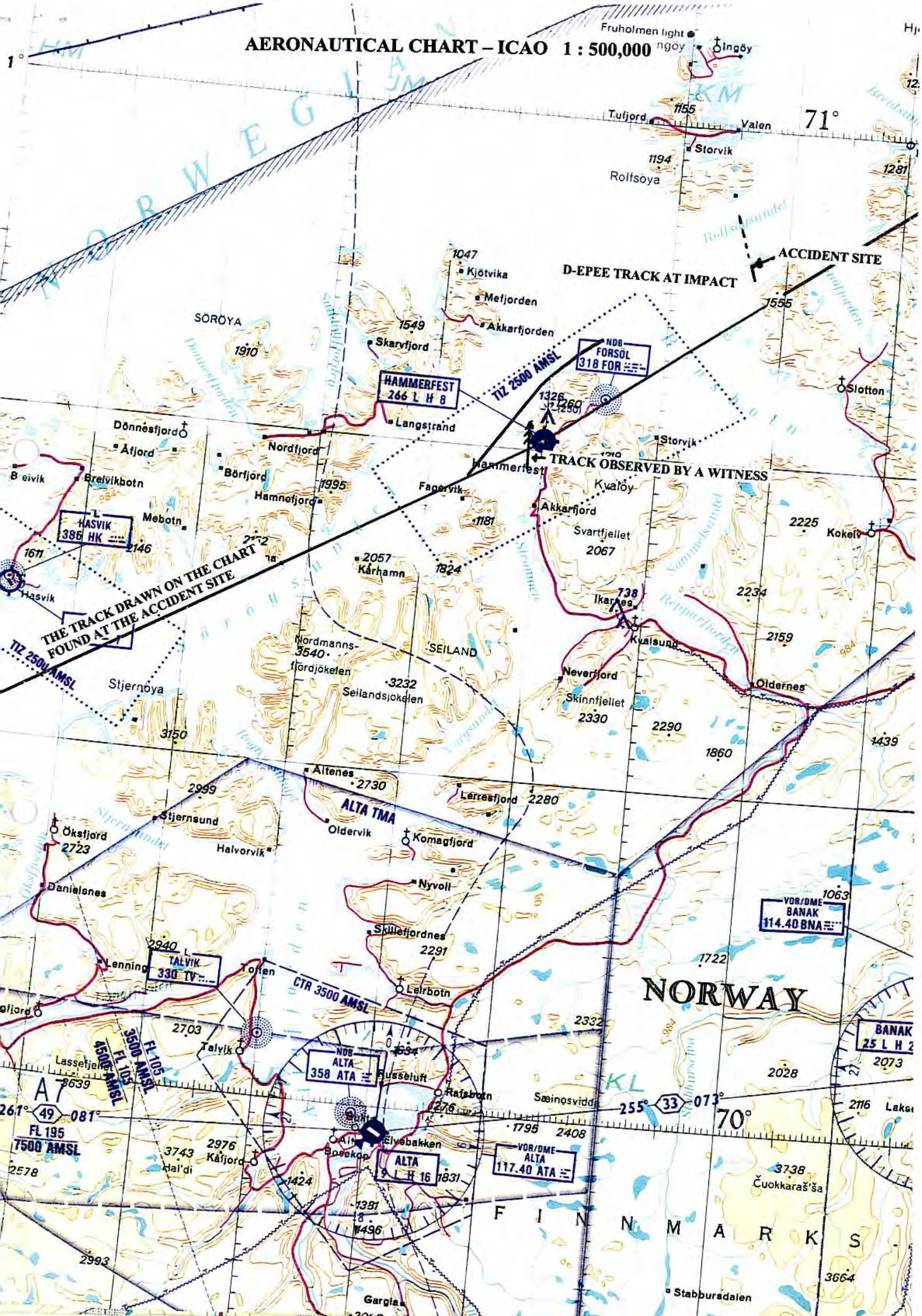
Because there are quite a number of German light aircraft on sight seeing flights in Northern Norway during the summer the Board recommends

1. that the Norwegian Civil Aviation Authority (NCAA) assess whether or not it is appropriate to suggest to the German CAA that German private pilots planning to visit Norway should be made aware of the hazards involved flying VFR in areas with marginal or poor weather conditions. (Ref. AIC A 07/00 –VFR flights in Norway) (Recommendation no. 64/2000)

The Board also recommends

2. that the Norwegian Civil Aviation Authority assess whether or not it is appropriate to issue a warning about over-reliance on GPS to carry out flights in areas with marginal or poor weather conditions. (Recommendation no. 65/2000)

Appendix: A map prepared by the Board showing the planned track, the track observed by a witness and the direction of flight at impact.


AERONAUTICAL CHART – ICAO 1 : 500,000
ACCIDENT SITE
D-EPEE TRACK AT IMPACT
TRACK OBSERVED BY A WITNESS
THE TRACK DRAWN ON THE CHART FOUND AT THE ACCIDENT SITE
HAMMERFEST 266 L H 8
NDB FORSØL 318 FOR
TIZ 2500 AMSL
HASVIK 386 HK
ALTA TMA
TALVIK 330 TV
CTR 3500 AMSL
NDB ALTA 358 ATA
ALTA 9 L H 16
VOR/DME ALTA 117.40 ATA
VOR/DME BANAK 114.40 BNA
BANAK 25 L H
NORWAY
FINNMARKS
SØRØYA
SEILAND
Stjernøya
Hasvik
Hammerfest
Kvaløy
Akkarfjorden
Storvik
Rolfsøya
Tufjord
Valen
Ingøy
Fruholmen light
Kjötvika
Mefjorden
Skarvfjord
Langstrand
Nordfjord
Dønnesfjord
Åfjord
Børfjord
Hamnefjord
Fagervik
Svartfjellet
Kårhamn
Nordmannsfjordjökelen
Seilandsjökelen
Ikarnes
Kvalsund
Neverfjord
Skinnfjellet
Oldernes
Kokelv
Slotton
Altenes
Oldervik
Komagfjord
Lerresfjord
Stjernsund
Halvorvik
Øksfjord
Nyvoll
Skilleifjordnes
Leirbotn
Lenning
Talvik
Rafsbotn
Sæinosvidda
Elvebakken
Bosekop
Kåfjord
Čuokkaraš'ša
Stabburadalen
Gargia
Lassefjell
Russeluft
Toften
Danielsnes
Oksfjord
1555
1281
1260
1995
2057
1824
2225
2234
2159
2290
1439
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2730
2280
2999
2723
2940
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2028
2073
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3232
3150
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738
FL 105 3500 AMSL
FL 103 4500 AMSL
FL 195 7500 AMSL
261° 49 081°
255° 33 073°
71°
70°