



**Statens haverikommission**  
Swedish Accident Investigation Board

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## ***Report RL 2009:01e***

Accident to aircraft SE-IIX at the lake Norasjön,  
Örebro county, on 10 June 2008

Case L-12/08

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**Statens haverikommission**  
Swedish Accident Investigation Board

2009-02-13

L-12/08

Swedish Transport Agency  
Aviation Department

SE-601 73 NORRKÖPING, Sweden

### **Report RL 2009:01e**

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The Swedish Accident Investigation Board has investigated an accident that occurred on 10 June 2008 at the lake Norasjön, Örebro county, involving an aircraft with registration SE-IIX.

In accordance with section 14 of the Ordinance on the Investigation of Accidents (1990:717) the Board herewith submits a report on the investigation.

Göran Rosvall

Agne Widholm

## Report RL 2009:01e

L-12/08

Report finalised 2009-02-13

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<i>Aircraft: registration and type</i>	SE-IIX, Cessna U206A equipped with floats
<i>Class, airworthiness</i>	Normal, valid Certificate of Airworthiness
<i>Registered owner/Operator</i>	Private ownership
<i>Time of occurrence</i>	2008-06-10, 16:57 hours, in daylight Comment: All times are given in Swedish daylight saving time (UTC + 2 hours)
<i>Place</i>	The eastern part of the lake Norasjön, Örebro county, (posn. 59°31.3'N 015°04.3'E; 83 m above sea level)
<i>Type of flight</i>	Private
<i>Weather</i>	According to SMHI's analysis: Wind southwest, 20 knots gusting to about 35 knots, good visibility, no cloud below 5,000 feet, temperature/dew point 20/5 °C, QNH 998 hPa
<i>Persons on board:</i>	
<i>crew members</i>	1
<i>passengers</i>	1
<i>Injuries to persons</i>	None
<i>Damage to aircraft</i>	Limited
<i>Other damage</i>	None
<i>The pilot:</i>	
<i>Sex, age, licence</i>	Male, 66 years, Private licence with seaplane qualification
<i>Total flying time</i>	2063 hours, of which 700 hours on type and 900 hours on seaplane of which 650 hours on type
<i>Flying hours previous 90 days</i>	44 hours, of which 41 hours on type and 41 hours on seaplane
<i>Number of landings previous 90 days</i>	62, of which 49 on type. All on seaplane

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The Swedish Accident Investigation Board (SHK) was notified on 10 June 2008 that an aircraft with registration SE-IIX had an accident at 16:57 hours on that day at the lake Norasjön, Örebro county.

The accident was investigated by SHK representatives Göran Rosvall, Chairman, and Sakari Havbrandt, Investigator in Charge, until 3 September 2008, and thereafter by Agne Widholm. SHK was assisted by Göran Persson as an operations expert.

The investigation was followed by Gun Ström, The Swedish Transport Agency.

### History of the flight and other facts

During the morning of 10 June the pilot, who was a joint owner of the aircraft, and his passenger flew from the home base at the lake Norasjön to Kilafors at the western part of the lake Bergviken. Before the flight he had telephoned the meteorologist at Arlanda airport. He stated that he received information concerning strong winds across the whole of Sweden and that

lightning storms could occur in the area of Kilafors. The flight was carried out at 2000-3000 feet. Within the landing area there were remainders of a cold front with some showers that he skirted.

The return flight began at 15:45 after the pilot had received weather information from the meteorological service at Arlanda airport via internet. He stated that the wind forecast for the landing area was 20 knots, gusting to 30 knots. The flight was carried out with visual ground in turbulent air at about 2000 feet. In the vicinity of Borlänge he descended temporarily to 1000 feet to localize and report two forest fires. After about 15 minutes he continued the flight towards Norasjön. A few minutes before arriving at Norasjön the pilot called the control tower at Örebro airport, which is located 34 km south of the landing area, in order to obtain current weather information. The wind at ground level at the airport was then stated as being south-westerly at 20 knots and gusting up to 30 knots.

The aircraft descended towards Norasjön heading south-west to about 500 feet above ground level, and the pilot made a left hand landing circuit at that altitude to check that the water surface in the intended landing area was free of boats and other floating objects. He saw that the wind was strong, generating breaking waves on the lake, but did not experience the turbulence as causing any difficulty. The landing was performed directly into wind on open water, without any nearby islands or islets. He assessed the wave height at about 30 cm. Witnesses have reported that the wind had increased during the day and was very strong. The entire open surface of the water was covered by breaking waves, "white horses". The wind indicator at the rescue station in Nora city indicated at the time for the accident 15 m/s (about 30 knots). Some heavier gusts occurred, which was also confirmed by the rescue leader. He assessed the wave height at about 40-50 cm.

According to the pilot the landing was normal, with the engine speed reduced to idling as the aircraft touched down. The flaps were fully extended (30°) and the indicated landing speed was 55-60 knots. His intention after landing was to switch off the engine and then drift backwards pointing the nose into wind to the seaplane base, which was located in a small inlet. While drifting backwards he was ready to temporarily start the engine if necessary, to correct his position.

After landing, when the speed had reduced, he thought he could see the water surface to the left had a small whirlwind, after which the left wing lifted so high that the right hand float was pushed under water and the right wingtip caught in the water. The aircraft then turned somewhat to the right. The left wing continued to rise and the aircraft began to tip forwards. The engine stopped dead when the propeller struck the water. After this, as the engine and the right wing continued to be pressed downwards, the aircraft approached the vertical. Just before the aircraft went over on to its back, angled to the right, they decided to get out of it. The whole sequence, from touchdown until the aircraft turned over, took only a few seconds.

When the aircraft turned over it first ended up on its back with the tail section above water level, but quickly sank down so that finally only part of the floats were above water. There was a faint smell of fuel. Those who had been on board climbed up on to the underside of the fuselage, and standing between the floats they waved to attract attention and signal that they were unhurt.

In an appendix to the KSAB Sjöflyghandbok<sup>1</sup> a table states the effect of wind in seaplanes. An extract from the table follows:

- 16-27 knots Rough seaplane weather
- 28-34 knots Seaplanes only to be flown in an emergency
- > 34 knots Impossible conditions for seaplanes

According to the Swedish Transport Agency sea flying at wind extending 15 knots should cause great care and at winds over 20 knots, at least private sea flying should be avoided.

The pilot stated that he did not experience any technical failure, so no technical investigation into the aircraft was carried out by SHK.



Fig 1: The accident site at the eastern part of the lake Norasjön

<sup>1</sup> Royal Swedish Aero Club Seaplane Handbook



Fig 2: The aircraft about one hour after the accident

### Survival possibilities

The pilot was not wearing a life vest and was only secured by a lap belt, which was not in accordance with the regulations in Luftfartsstyrelsens författningssamling, LFS<sup>2</sup>, reference 2007:58, chapter 2, § 48 in respect of being secured by shoulder straps and § 49 in respect of wearing a life vest.

The pilot held on to a strut inside the cabin when the aircraft tipped forward and by agreement with the passenger exited first through the left front door. He took with him an inflatable life vest from the rear seat and put it on. The passenger, who was seated to the right of the pilot, was strapped in by both belt and shoulder harnesses and was wearing an inflatable life vest. He stated that he did not move the control wheel before the aircraft tipped over. He was not familiar with flying but was experienced in water with, among other things, a diving certificate, and did not inflate the life vest. When he left the aircraft it was upside down and the cabin was more than half full of water. He dived in order to swim out through the same door the pilot had just used.

Both the pilot and the passenger got wet, but were totally unhurt.

### Rescue efforts

The pilot did not have time to transmit an emergency message by radio. The accident was witnessed from land and a person who saw two people climb up on to the aircraft called at 16:57 the emergency services on 112. At 17:00 the rescue services in Nora city, police and ARCC<sup>3</sup> were alarmed. ARCC alarmed a rescue helicopter at Arlanda airport to, if necessary, fly via Västerås to pick up a diver. The helicopter was airborne at 17:14 but the alarm was cancelled shortly after that, because the rescue effort was made by boat.

The Nora rescue services turned out with a boat which crossed the lake and reached the scene of the accident at 17:10, with four rescuers, of which two were dressed in diving suites. Six minutes later the survivors were taken on board and transported to land where ambulances were waiting.

<sup>2</sup> LFS - Swedish Civil Aviation Authority Statute Book

<sup>3</sup> ARCC – Air Rescue Coordination Center

Since they were completely unhurt and only wet and cold, they rejected transport by ambulance and drove home in the pilot's car.

The rescue services checked that there was no leakage from the aircraft. Because of rough sea and strong wind they could not save the aircraft. It could not be secured at any point, so it was marked by a buoy. It was retrieved later by the owners and suffered no damage other than from ingress of water. According to the owners there was no environmental impact from pollution during the retrieval.

## **Conclusions**

Witness opinions concerning the wind and the appearance of the waves indicate that the wind on the open lake Norasjön was stronger than had been measured at Örebro airport and at the rescue station in Nora city. Furthermore strong gusts often deviate from the principal wind direction, especially if they are influenced by surrounding terrain. There is also a risk for whirlwinds, "minitornados".

The landing was performed in wind conditions that according to the Swedish Transport Agency should be avoided and according to KSAB Sjöflyghandbok only should be made in an emergency situation or is regarded impossible for seaplanes.

After touchdown the aircraft was probably hit by a strong gust or a whirlwind from the left. When the left wing rose up and the right wing was forced down so that the wing tip caught in the water, the aircraft was turned to the right. This further increased the lift forces on the left wing. This meant that the wing lifted even more and presented a greater surface area to the wind. The sequence was impossible to stop.

In this case the survival possibilities were not affected by the pilot not using shoulder straps or a life vest.

The accident was caused by the flight being planned and executed in wind conditions that did not permit safe control of the aircraft.

## **Recommendations**

None