Statens haverikommission
Swedish Accident Investigation Board

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Report RL 2003:48e

Accident involving the ultralight aircraft SE-YVV offshore Korsholmen, Dalarö, AB County, on the 31st of July 2003

Dnr L-35/03

SHK investigates accidents and incidents with regard to safety. The sole objective of the investigations is the prevention of similar occurrences in the future. It is not the purpose of this activity to apportion blame or liability.

The report is also available on our website: www.havkom.se

Translated from the original Swedish by Dennis Lynn Anderson, at the request of the Swedish Accident Investigation Board.

In case of discrepancies between the English and the Swedish texts, the Swedish version is to be considered the authoritative version.

Statens haverikommission (SHK) Swedish Accident Investigation Board

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2003-12-19 L-35/03

Swedish Civil Aviation Administration

601 79 NORRKÖPING

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The Swedish Accident Investigation Board (Statens haverikommission, SHK) has investigated an accident that occurred on the 31st of July 2003 offshore Korsholmen, Dalarö, AB County, Sweden, involving an ultralight aircraft with registration SE-YVV.

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

The Swedish Accident Investigation Board kindly awaits a reply by the 18th of June 2004 concerning how the recommendation issued in the report has been complied with.

Lena Svenaeus

Sakari Havbrandt Dan Åkerman

Appendix 1

Extract from Register of Licenses regarding the pilot (to the Swedish Civil Aviation Administration only)

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Report finalized 2003-12-19

Aircraft:registration, type	SE-YVV, Eurocub Mk IV, equipped with floats
Class, airworthiness	Ultralight, valid permit to fly
Owner/Operator	Privately owned
Date and time	2003-07-31, 13:18 hours in daylight *Note:* All times refer to Swedish Daylight Savings Time (UTC + 2 hours)
Place of occurrence	Korsholmen, Dalarö, AB County, (pos 5908N 01825E; at sea level)
Type of flight	Private
Weather	According to SMHI's analysis: south easterly wind at 4-7 knots, good visibility, clouds 1/8 cumulus with bases at 2,000 feet, temp./dew point +25/+19 °C, QNH 1020 hPa
Persons on board:crew	1
Injuries to persons	None
Damage to aircraft	Substantial
Other damage	None
Pilot in command:	
Age, sex, license	59 years, male, UL-license
Total flying time	154 hours, of which 14 hours on type
Flying hours previous 90 days	20 hours, of which 14 hours on type
Number of landings previous 90 days	59, of which 51 on the type

The Swedish Accident Investigation Board (SHK), was notified on the 31st of July 2003 that an accident had taken place on that same day at 13:18 hours, offshore Korsholmen, Dalarö, AB County, Sweden, involving an ultralight aircraft with registration SE-YVV.

The accident has been investigated by SHK represented by Lena Svenaeus, Chairperson, Sakari Havbrandt, Chief Investigator Flight Operations and Dan Åkerman, Chief Technical Investigator Aviation.

The investigation has been followed by the Swedish Civil Aviation Administration through Daniel Hummerdal.

History of the flight

The pilot had taken off from Lake Mälaren in the vicinity of the community Kungsängen. Thereafter he flew to Dalarö where he intended to land and dock the aircraft at Korsholmen. The pilot has stated that he flew a normal landing pattern and performed a normal landing. Shortly after touchdown the aircraft decelerated rapidly and tipped over forward, causing the propeller to come into contact with the right-hand float. The pilot was unharmed and could evacuate the wreckage by himself. Passing pleasure-boats then assisted him. The aircraft continued to float right side up for a while but when the severely damaged right-hand pontoon became filled with water the aircraft overturned. It remained afloat upside-down with only the left-hand pontoon and a wingtip visible.

The pilot's testimony is supported by a witness to the accident, who also states that the water was calm without any large waves or swells.

The floats are manufactured by a company in the United States and delivered in kit-form to the aircraft manufacturer who has assembled them and installed them on the aircraft. Each pontoon kit consists of a body, a deck, material for ribs and various fittings and covers. The assembly of the floats, which are of a fiberglass construction, entails the cutting to size and gluing of ribs into the float body, after which the deck is glued in place with the help of a 30 mm wide flange. Included with the floats are assembly instructions, called the "Assembly Manual", which is dated 1996. Under the section called "RIBS" it is only stated that it may vary how ribs should be placed in relation to landing gear attachment points by:

"Rib location may vary as loading requirements require."

However, this is described in the section called "HELPFUL HINTS", where it, among other things, is stated that the distance between a landing gear attachment point and a rib shall not exceed six inches (150 mm). Furthermore one can understand from the instructions that each attachment point shall be strengthened with a 150-mm wide fiberglass reinforcement.

The technical investigation showed that the right-hand float was compressed at the landing gear attachment points and that most of the joints between the float deck and the body was broken. Furthermore, that the 150-mm wide fiberglass reinforcement was missing and that it was a distance of more than 500 mm between the landing gear attachments points and the nearest rib. There was discoloration within the joints between the float body and the deck, which could indicate that there were areas where the adhesive had loosened prior to the accident.

The aircraft manufacturer has stated that it has deliberately eliminated the fiberglass reinforcement and compensated for this by introducing a longer aluminum fitting in order to distribute landing gear load over a larger area of the float deck. The aircraft manufacturer has further stated that the instructions concerning the minimum distance between ribs and attachment points were not noticed, as this specification was neither included in the section "RIBS" or in the sketches that are part of the instructions.

The modification of the floats that was performed by the aircraft manufacturer had not been inspected by the authorities of the country of manufacture or by any other appropriate authority.

There is no requirement for type certification[1] of ultralight aircraft by the authorities of the country of manufacture or by Swedish authorities. The Swedish Aviation Safety Authority issues an affidavit of type after an inspection, which is accomplished by the Swedish Powerflight Association, KSAK. This type affidavit solely defines dimensions, weights, speeds, equipment, manuals, sign plates, operational limitations and so forth.

KSAK had inspected the float type and installation on another aircraft of the same type. The floats on that aircraft were installed by the float manufacturer and had ribs adjacent to the landing gear attachment points.

Within operations involving amateur built aircraft, which is regulated by BCL-M 5.2, each individual aircraft is evaluated by a specially trained inspector.

Conclusions

It is well known that ribs or the equivalent are required within a monocoque construction where one applies abrupt transverse forces. In the case here under investigation, there was an absence of ribs, which meant that

[1] Type certification: An extensive process wherein the aircraft is inspected and defined in detail. Type certification leads to the issuance of a type certificate.

the adhesive flange was subjected to heavy outward bending forces when the pontoon was subjected to compression loading.

It is probable that portions of the adhesive seam between the float and its deck had gradually loosened during previous flights. This may explain why the float suddenly collapsed, despite the existence of only normal landing loads.

The instructions provided by the kit manufacturer can be considered to be insufficient, as they do not clearly show that ribs must be installed adjacent to attachment points. It is therefore understandable that the aircraft manufacturer did not observe this instruction.

There is a lack of a system to confirm that subsequent aircraft from a manufacturer have the same workmanship as the aircraft that was type-inspected. SHK is of the opinion that a technical inspection of each individual aircraft is necessary in order to insure the airworthiness of ultralight aviation materials.

The accident was caused by an inadequate method of assembly of the floats. Contributory has been that the instructions for assembly was unclear.

Recommendations

SHK recommends the Swedish Civil Aviation Administration to work for that the technical inspection of ultralight aircraft is elevated to at least the level that is applicable for amateur built aircraft. *(RL 2003:48e R1)*.