



Bulletin: Capsizing and sinking of the Pilot boat L-242 (FIN) in the Gulf of Finland off Emäsalo 8 December 2017

Marine Accident: M2017-04

Link to the safety investigation report:

Pilot boat L-242 wreck inspection (video): <https://bit.ly/2xGhgSr>



Sequence of events and the vessel involved

- The pilot boat L-242 is a high-speed pilot boat, of the Pilot 1500 type, manufactured by Kewatec AluBoat. The boat was built in accordance with, and fulfilled, the Commercial Craft Rules (2009.1), design category B, issued by the Finnish Maritime Administration. Neither self-righting capability nor emergency exits were required.
- On 8 December 2017, the pilot boat was collecting a pilot from the tanker MT Sten Nordic. The boat followed astern of the MT Sten Nordic, where it was sheltered from the rough waves, while preparing to take the pilot on board. The MT Sten Nordic began providing shelter for the transfer of the pilot, by turning sharply to the port side (left), upon which the pilot boat began moving towards the port side of the vessel. At this point, the pilot boat was exposed to steep and high, recurring waves caused by the combined effect of the vessel and the rough waves, while around 20 to 30 metres from the stern of the vessel. The pilot boat keeled over in the resulting wave, momentarily lost stability and, at 16.56 hours, capsized onto the left side on which it began floating, with the cabin door of the pilot boat almost totally submerged. The MT Sten Nordic, which had observed the capsize, reported the accident and returned to the scene. The pilot boat turned upside down around 10 minutes after capsizing. No sightings of the crew were obtained. Upon the arrival at the scene of the first rescuers at 17.38 hours, the boat was floating in the rough waves with its hull turned upwards. During the rescue operations performed in harsh conditions, no sighting was gained of the pilot boat's operators and, after the six-hour or so rescue procedures, the pilot boat sank to 30 metres in depth. The two operators of the pilot boat who died in the accident were found, wearing survival suits, in the cabin during an inspection dive of the wreck at 00.13 hours on 9 December. The storage unit of the pilot boat's life raft, which had filled with water, was found on the seabed around 10 metres from the wreck. The location of the life raft's storage rack in the pilot boat prevented its automatic detachment when the boat was floating upside down. The storage unit only detached from its rack when the boat had sunk to around 1.5...4 metres, but did not inflate due to its loss of buoyancy and the incomplete unravelling of the inflation cord.

Conditions

- The wind speed from the south was 10 to 12 m/s, with gusts of around 15 m/s. The wind, which had lasted a long time, created a heavy sea in the area with an effective wave height of 2 metres. The highest waves were almost 4 metres. The long waves (50 to 150 metres) affecting the area came from a bearing of 240 degrees and short waves from 180 degrees. A wind warning was in force. The surface temperature of the seawater was around +5.5 degrees. The conditions hampered the rescue measures being taken in the dark.
- The conditions were not exceptional with regard to pilotage. Instead, the direction of the waves formed to the stern of the MT Sten Nordic as it turned, the greater wave height and the steep incline created unexpected and fatal conditions for the pilot boat. Insufficient preparations had been made for such effects.

Conclusions

The conclusions include the causes of the occurrence. A cause means the various factors in the background of the incident and the direct and indirect circumstances affecting it.

The development of vessels categorised as commercial craft has progressed from slowly righting cutters to high-speed pilot boats.

- *No clear official standards exist with regard to commercial craft, which has led to the interpretation and adaptation of a wide range of rules. This creates the risk that insufficient account is taken of special standards applying to various intended uses of commercial craft, and the conditions in which they will be used, during the vessels' manufacture and when ensuring their safe use.*

Pilot boat L-242 was built according to design category B. There were shortcomings in its stability in the sea conditions in question. The current regulations on stability do not take sufficient account of the boat's behaviour in rough waves, and their adequacy is not questioned.

- *Such a boat must be capable of operating in rough waves according to design category B, which means a wave height of 4 metres and a wind speed of 21 m/s. In strong waves, the L-242 can temporarily lose up to 70% of its stability, during which the external force caused by, for example, the turning of the rudder can capsize the boat. No account has been taken of these factors in the design, manufacture or use of the boat.*

A commercial craft buyer orders a vessel fulfilling the directions developed by VTT Expert Services Oy. The shipyard builds a boat in accordance with the order. VTT Expert Services Oy supervises the boat's construction, inspects the boat and draws up an inspection report. The Finnish Transport Safety Agency inspects and approves the boat for use. Pilot boat L-242 had been inspected as a cargo vessel.

- *No clear, official regulations are in use in Finland on the construction and safety inspection of commercial craft.*

The darkness and sea conditions limited the ability of the pilot boat's crew to estimate the distance to the MT Sten Nordic. As the turn began, the pilot boat remained astern of the MT Sten Nordic, upon which steep waves began to strike the pilot boat sideways, causing a powerful rocking motion. There is reason to believe that the crew had no reason to suspect that the boat would capsize, because they were not sufficiently aware of the boat's stability characteristics in rough waves and pilot boats are regarded as safe in all conditions.

- *As the MT Sten Nordic turned, the pilot boat was exposed to rough waves coming from the side, as well as recurring steep and high waves due to the sea conditions combined with the effect of the moving vessel's hull. As a result, upon losing much of its stability, the pilot boat keeled over, rocked back and forth a few times and capsized onto its left side around 2030 metres from the MT Sten Nordic.*

The stability characteristics of a pilot boat are not considered in the pilot company's operating manual, the manual for the pilot boat L-242, or the safety manual for pilot boats.

- *No account is taken of the momentary loss of stability or capsizing risk of a pilot boat in rough waves. Pilot boats are generally assumed to be self-righting and safe in all conditions, for which reason the capsizing was unexpected.*

Deviation reporting by pilot boat operators is minor compared to that of pilots. With respect to pilot boats, reported deviations, of which there have only been a few, have been related to the technical aspects of the vessel. The pilot boat L-237 keeled over dramatically in a similar situation in November 2013 off Emäsalo. No deviation report was drawn up on the situation.

- *The piloting company's operating manual focuses on piloting and pilot safety, not the safe use of pilot boats, which has implications for the development of piloting safety.*

In practice, the safety management of piloting companies is not subject to inspection in the same way as shipping companies are. A Safety Management System, SMS, is required from shipping companies.

- Finland has no monitoring system for the safety management of piloting operations. There are no statutory auditing obligations for the operations or operating manuals of piloting companies. The development of a company's operations is based on voluntary ERP operations.

The task-based induction of the pilot boat operators had not been systematically documented and did not cover safety risks related to the handling, steering and stability of boats in great enough detail.

- *The induction of pilot boat operators is variable and is not necessarily sufficient in terms of the challenging nature of the work or ensuring safety. Risk identification and safe practices are largely based on silent knowledge rather than documentation and systematic risk assessment.*

GMDDS distress communications had not been activated as the radio communications regulations require, for which reason some of the vessels participating in the rescue operation did not receive real-time situational information. The piloting stations and boats had technical information on the capsized pilot boat.

- *The activation of distress communications as required by the radio communications regulations would have secured information exchange between the pilot boats and stations involved, and the units directing and participating, in the rescue operation.*

The Helsinki sea rescue helicopter, which brought two surface rescuers and two divers, was the first to arrive on the scene at 17.38 hours, 42 minutes after the pilot boat had capsized. A patrol boat from the Porvoo Coast Guard Station arrived at the same time. The VL Turva announced its participation and arrived at the scene at 18.58 hours.

- *Nothing could be done to rescue the victims by the time the rescue units reached the scene of the accident. The cabin of the pilot boat filled with water upon attempts to open the door, and the boat capsized into an upside down position by 17.07 hours. Wearing their survival suits, the crew were unable to leave the cabin, which had only one, submerged*

exit. The accident showed that, after the type of boat in question had capsized into an upside down position, it was impossible to rescue people from it. Neither the boat's designer, builder, piloting company nor the authorities had identified this risk. This was also affected by the fact that the pilot boat's risk of capsizing had not been identified.

The information received at 18.30 hours, that the door of the pilot boat was open, was not confirmed and relayed to the Maritime Rescue Sub-Centre or the commander of diving operations on the VL Turva. Lack of information led to the wrong conclusions and assumptions being formed about an air pocket in the cabin.

- *Observations affecting the rescue effort should have been confirmed and relayed to those in command of the rescue operation and the participating units.*

A sufficiently accurate situational picture could not be formed during the rescue operation, due to inadequate initial information on the location. A sufficiently effective set of practices was lacking for this type of rescue operation.

- *The Maritime Rescue Sub-Centre was not prepared for an unexpected accident of this kind.*

The Maritime Rescue Sub-Centre has agreed practices for alerting a national provider of psycho-social support, i.e. the Social Emergency and Crisis Center of Vantaa. Municipal social emergency response centres have only agreed with their local emergency response centres on being alerted in the case of accidents.

- *Emergency response centres and Maritime Rescue Sub-Centres have a range of practices for the alerting of psycho-social support services. Municipal social emergency response centres did not receive information from the Maritime Rescue Sub-Centre.*

Not all of the relatives of the deceased received news of the deaths from the police, or the related crisis support procedures. Instructions would have provided practical guidance and contact information for crisis assistance. The departure from normal practices affected the crisis support provided for the relatives.

- *The relatives of the deceased were informed of the accident in various ways, for which reason some were not given direct guidance on obtaining crisis support. Alerting the municipal social emergency response services would have ensured the linkage of psycho-social support to news of the deaths.*

Safety recommendations

The Safety Investigation Authority recommends that,

- the Finnish Transport Safety Agency draw up rules for commercial craft that take account of the various purposes for which commercial craft are used and the special requirements related to the circumstances.
- in its ERP system, Finnpiilot Pilotage Oy describe the pilot transfer process and develop and implement its deviation reporting system a manner that provides a more comprehensive picture of the hazards and the observed safety deviations that occur during pilot transfer.
- Finnpiilot Pilotage Oy develop the induction processes and competencies of its pilot boat operators in such a manner, that the seaworthiness and safe handling of different types of boat can be guaranteed in the conditions in which pilot boats are used.
- the Finnish Border Guard prepare for unusual, as well as more common, emergencies and develop practices for obtaining the background information needed for rescue operations.
- together with the Ministry of Social Affairs and Health, the Finnish Border Guard clarify the practices to be followed for alerting psycho-social support services during maritime accidents and that the chain of assistance take account of national social emergency services, and the national role and tasks of the social and crisis emergency support services.



Photo. The L-242 pilot boat, raised from the sea for the investigation

