



European
Barge
Union



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In-depth study of the human factors in inland shipping accidents commissioned by the European inland shipping industry

Data shows that human factors, including various human errors, is the primary cause of a large number of accidents in inland navigation. It is therefore a key topic to analyse and further investigate, both for the safety on board, but also for the overall image of inland shipping being a safe mode of transport. The results of a first phase of the research - data and expert analysis - have provided useful tools for a second and more in-depth phase of the research, which was recently commissioned. The European inland shipping industry will use the results of the study to provide a valuable and substantiated input to further discussion. Above all, the results of this study could contribute tremendously to the prevention and reduction of accidents in inland shipping.

Research phase 1

The numbers unfortunately don't lie: human factor plays a decisive role in approximately 70-80% of all the accidents that occur in inland shipping. Leaning back is therefore not an option. A common response that we usually see in the aftermath of a serious incident is to draw up new regulations. However, the European inland shipping industry believes that before deciding on measures and/or regulations, a proper analysis of the causes of relevant incidents is necessary. For this reason, in 2020, the European inland shipping industry, represented by the European Inland Waterway Transport Platform, the insurers united in IVR and the Dutch Ministry of Infrastructure and Water Management, has commissioned the Intergo research agency to conduct a first phase of the study entitled '*Human factors root causes of accidents in inland navigation*'. During this initial phase of the research, the main causes of inland navigation accidents were identified and prioritized, as summarised here below: human factors plays a decisive role in 70-80% of the incidents in inland shipping. As contributing root causes have been identified:

- Regarding the interactions inside the wheelhouse, the communication plays a role in 40% of the incidents. Other crucial determinants are a time of the day and poor human-machine interface.
- Organisation on board inland vessels - such as organisational culture and overall safety awareness - can be a contributory factor to the incidents.
- Finally, infrastructure and environmental factors might play a role.

The results of the study's first phase can be retrieved via the following two links:

- [Nederlands rapport menselijke factoren aan de basis van ongevallen in de binnenvaart](#)
- [Engels rapport human factors root causes of accidents in inland navigation](#)

Research phase 2

Above-mentioned results of the first phase of study *‘Human factors root causes of accidents in inland navigation’* provide us with very important information. People sometimes make a mistake, it does happen, however then the surroundings ensure that such mistakes remain hidden. It might be because of purely organizational factors, however also the technology can play a role. It is therefore crucial to adjust and accommodate the environmental conditions to people, otherwise we will be waiting for new incidents to happen. There is a need for better understanding why everything goes well on board but why sometimes things can go really wrong. The main objective to keep in mind is that the processes and systems can be designed in such a way that fewer or no mistakes are made and impact of mistakes is limited! That was the rationale behind a recent decision of the European Inland Waterway Transport Platform to commission a second and more in-depth phase of the study on behalf of the European inland shipping companies. Also, IVR and the Dutch Ministry of Infrastructure and Water Management are closely involved in this research phase. The second part of the study consists of two parts:

Phase 2a: Human-machine interface in the wheelhouse

This phase includes further research into a human-machine interface in the wheelhouse. We must take into account not only current but also future levels of the information provision and automation in the wheelhouse. This in-depth study focuses on the interactions between a human and a machine with an ambition to provide a more complete view of a user-friendly wheelhouse and its design. The research should give us more insight and a better understanding of what and when is happening in the wheelhouse, why it goes wrong and what the underlying causes of problems are. In this way, the overall design can be optimized and improved. Human-centered design (HCD) involves human perspective in all steps of the problem-solving process with the aim of preventing incidents due to human errors. The results of this part of the study are evidence-based recommendations for a safe human-machine interface and wheelhouse design.

Phase 2b: Further investigation into four common accident causes

This phase includes further investigation of the four most plausible accident’s causes as identified earlier in the research phase 1, namely: **communication; fatigue and stress; specific waterways or situations; and qualification of crew members**. The main research question we are asking here is therefore: *‘How to improve the future training content both for young trainees and for already experienced crew members?’*. The results of this part of the research are recommendations and guidelines on the preventive organizational measures taking into account varied human factors.

Contribution to the reduction or prevention of inland navigation accidents

The European inland shipping industry and IVR want to use the study results to provide a practical, valuable and substantiated input to further discussion, but above all, to contribute to the reduction and prevention of accidents in the inland shipping. This is very important for safety on board inland vessels, however also for the image of inland shipping industry as a safe mode of transport. Active input from the inland shipping sector is critical in order to conduct a thorough research. Cooperation from within the sector, for example in completing questionnaires, is therefore greatly appreciated.

Note to the press. For more information, you can contact:

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