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Results from the in-depth study on organisational human factors aspects in relation to accidents in inland navigation

Various issues with communication between ships, a need for a life-long personal development for crew and staff, importance of the distributed responsibility across the supply chain loop and boatmaster's role, and specific waterway situations increase risk of an accident. These are the four most important findings from Intergo's research into the organisational aspects in relation to accidents in inland navigation. The study was commissioned by the IWT Platform with the involvement of IVR.

Due to an increasing number of accidents and damage claims in the inland shipping industry, Phase 1 of the study into human factors in relation to the accidents started in 2020. The conclusion was reached that human factors account for about 70-80% of all accidents. Following this study, the above IWT partners have commissioned the research agency Intergo to conduct a **Phase 2** of the study for more in-depth examination. An additional motivation for the study was expressed by Paul Goris, president of the IWT Platform: ***"The Inland Waterway Transport sector is on the eve of a major transition in terms of sustainability and digitalisation. This requires further development of standards and certain safety requirements."***

Phase 2 consists of two separate studies:

- **Phase 2a**, emphasising *the human-machine interface in the wheelhouse and its design, also in light of the current and future levels of automation and information provision*. You can [read here](#) more about its main findings, recommendations and next steps following the publication of the Phase 2a Report earlier in November 2021.
- **Phase 2b**, emphasising **four organisational aspects** as plausible root causes of accidents, namely: *communication, qualification of crew members, fatigue and stress, and specific waterway situations*.

Intergo has delivered [the report covering Phase 2b](#) that examines in detail those four factors related to an inadequate level of organisational factors across the IWT sector. The results are based on expert sessions, an international questionnaire for skippers and inland shipping industry, followed by vessel visits with interviews and observations.

Results

Organisational factors have an impact on the overall communication and planning, thus also influencing operational risks and safety. As learnt in the course of conducting the study, a combination of various *communication issues between ships* – i.e. limited use of standard communication protocols and phraseology, and limited command of a shared language – together with a high adoption of automation, can contribute to accidents. A crucial observation made is related to a need for *a life-long personal development* of staff and crew since an immature operational risk culture in the organization, limited skills of less experienced crew members on board etc. can contribute to accidents. *The role of boatmasters* is emphasised for their end responsibility for safe navigation and boat operation however being dependent on other parties in the supply chain loop. When the crew is put under pressure, it might unintentionally lead to concessions in operational risks, including safety, e.g. journey planning, sailing under challenging conditions or suboptimal work-rest schemes. Last but not least, *specific waterway situations* are believed to contribute - to a lesser extent - to accidents. In practice, the boatmasters experience difficulties in having easy access to reliable information, such as actual water levels.

Recommendations

The **first recommendation** from the Intergo report is to update and improve protocols and guidelines on VHF communication in inland navigation, including incorporating a shift to one shared nautical language across the IWT ecosystem. The **second recommendation** is to develop an integral vision on life-long personal development for crew members especially on management/ entrepreneuring and non-technical skills. Apprentices should be supervised more while sailing and more practice should be integrated in education. The **third recommendation** is to explore possibilities to distribute responsibility of time-bound operations across the IWT ecosystem in a more closed supply-chain loop. The **fourth recommendation** is to develop a shared vision of the helmsman's position and on the minimum requirements of information and automation needed at such a position, including route planning, minimum safe clearance conventions, but also the use of non-task related systems, like personal social media and TV. Lastly, the **fifth recommendation** is resonating from Phase 1: to develop a central database of European inland navigation that includes clear definitions and overall information, allowing to learn from accidents and to prevent them from happening again in the future. Recommendations may be combined.

The research has been summarised in [a technical leaflet](#) that concisely presents its most important aspects.

Next steps

As previously stated, the question of human factors root causes is not only about the technical standards and regulations, but also about the qualifications and skills of crew members, and the way how everything is organised on-board vessels and across parties in the sector.

It is crucial that the recommendations from study Phase 2a (about HMI and wheelhouse design) and Phase 2b are followed up in an integrated manner. To put these recommendations into practice, Intergo recommends developing a roadmap that will involve all relevant IWT stakeholders, as the new guidelines should first of all be appealing to all parties involved.

Gerit Fietze, secretary of the IWT Platform, says: ***"This study will be an important contribution to future work. The knowledge gained from it will help us in the development of European manning regulations as well as in the general organisation of personnel. The results of phase 2b should help to make the sector even safer and more attractive for young people entering the sector."***

The results of the study's Phase 2a and 2b can be retrieved via the following links:

- [Report Phase 2a – click here](#)
- [Report Phase 2b – click here](#)

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

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