

# Disasters at sea trigger ship-safety advances

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Credit: Pixabay/CC0 Public Domain

When one of the world's largest container ships crashed into the bank of the Suez Canal in 2021, a major gateway for global trade became blocked with an estimated \$9.6 billion in daily commerce being held up.

Accidents like the one involving the Ever Given almost three years ago

are more common than might generally be thought. They also help explain the motivation behind EU research projects to improve shipping safety.

## Ship shockwaves

In 2022, 10 cargo vessels were lost at sea, according to global insurer [Allianz](#). Shipping transports 90% of the world's goods.

"Anyone reading this will, for example, be wearing something that was at one point transported by a ship," said Jorgen Grindevoll, chief executive officer of Ladar, a UK company developing collision-avoidance technology for vessels and marine infrastructures.

Maritime accidents can send shockwaves across the globe by hindering trade, damaging the environment and endangering lives.

"When ships run into trouble, it can be very disruptive," said Grindevoll, who is also a sea captain.

He was part of a research project to develop a lookout that never sleeps: [sensor technology](#) to reduce the risk of ships colliding with other vessels or objects floating in the water.

Called [MARINA](#), the project is wrapping up after almost three years. Its participants have included Ladar, Cypriot shipping-technology developer Offshore Monitoring—also the project coordinator—Norwegian sensor-technology company Hjelmstad and UK-based Global Maritime Services, with captains and navigators from the sector represented.

The researchers looked at serious ship mishaps and found that almost half involved collisions and that, of those, 59% occurred as a result of human error, according to Jena Dover, business development manager at

Global Maritime Services.

"This shows how important this problem is," said Dover.

## Surface scanners

MARINA's lasers, high-definition cameras and thermal imaging scan for floating obstacles such as containers, timber, sailboats and [fishing gear](#), helping onboard navigators detect possible threats on the [water surface](#)—their main blindspot.

An artificial-intelligence algorithm can automatically detect, recognize and track objects and then alert crew to any potential threat. That's beyond the ability of existing best-available technology on the market.

"A ship can already scan underwater using sonar and above water using radar," said Grindevoll. "But around the surface there's a sensor gap. That's what we're addressing."

## Flood focus

But if the worst does happen and a ship is struck, damage limitation is crucial to save lives and equipment.

This is what another project sought to do. Called [FLARE](#), the project ran for three and a half years through November 2022 and came up with design improvements to limit damage from flooding in stricken vessels.

"There's still a number of areas where our designs and procedures could be safer," said Dr. Stephan Wurst, managing partner at Germany-based BALance Technology Consulting, which led the project.

For instance, damage from groundings—when a ship's hull hits the sea bottom—can be catastrophic.

In 2012, a [cruise ship](#) called the Costa Concordia ventured too close to the Italian island of Giglio and struck rocks. The accident led to the deaths of 32 people, the partial sinking of the vessel and a €1.5 billion salvage operation.

"We looked at better design principles that can prevent water from entering everywhere, but also how to improve evacuation and safety procedures," said Wurst.

Computer simulations of how ships sink as well as the simulated sinking of model boats in a [controlled environment](#) helped the researchers pinpoint where these improvements need to be made.

A detailed list of the project's recommendations has been presented to the International Maritime Organization, the governing body for the shipping industry.

They range from blocking water in a ship with watertight doors and barriers in the hull to fixing holes with foam, according to Wurst.

## **Ripple effects**

While the proposals are still being evaluated by the IMO, the project's participants including the Meyer Turku shipyard in Finland and UK-based cruise line operator Carnival are applying the knowledge gained in their new vessels.

"This isn't just theoretical research we did," said Wurst. "The lessons we learned here might actually save lives."

In the meantime, the surface-scanning technology developed by MARINA is close to being commercialized. Grindevoll expects it to be market-ready by early 2024.

He said the technology may have uses beyond preventing ship collisions, such as on crewless vessels and surveillance of offshore installations like wind turbines.

"We have realized our technology can also be used in other areas," Grindevoll said.

**More information:**

- [MARINA](#)
- [FLARE](#)

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