

WATCHFREE BRIDGE?

PRESS RELEASE

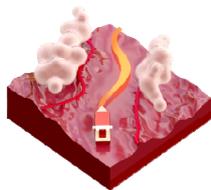
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B ZERO relieves officers and improves safety

Hamburg. The major challenges facing maritime transport include growing global trade volumes, improving maritime safety and increasing productivity and profitability. Increasing maritime traffic results in an increase in dangerous situations in which accidents are often accompanied by human error. And globalization and digitization require ongoing efforts from companies to optimize processes and reduce operating costs through efficiency gains in order to remain competitive in the long run.

The German Federal Government is responding to these challenges by funding research in the BMWi's (Federal Ministry for Economic Affairs and Energy) "Maritime Technologien der nächsten Generation" (Next Generation of Maritime Technologies) program. The research priorities of this program include maritime digitization, smart technologies and maritime safety. The development of innovative solutions to market maturity is intended to secure and extend a technological lead in German and European maritime research.

B0 | B ZERO **Manned.Watchfree.8h**



Picture 1: Project logo B ZERO (© Fraunhofer CML)

Against this background, the Fraunhofer CML has initiated a research project in which the watchfree bridge (B Zero) is to be developed. In contrast to unmanned ships, nautical officers are on board, but under certain conditions B ZERO should enable a completely unmanned bridge for up to eight hours so that the officers can realize flexible watch rhythms or perform other tasks. B ZERO is to be made possible by the use of sensors to record the ship's environment, decision support systems to evaluate the recorded information and initiate appropriate reactions,

Contact

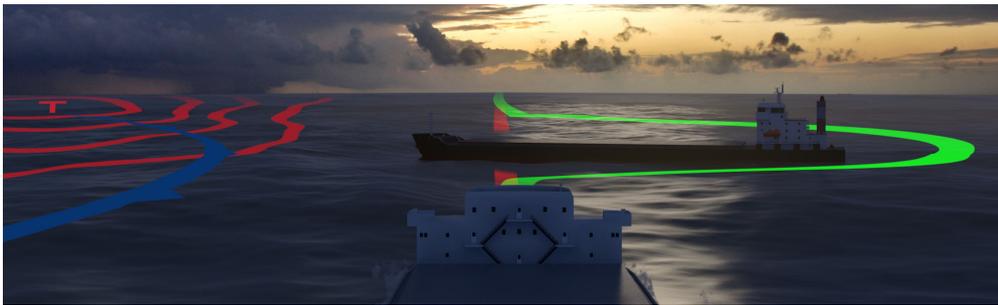
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and a documentation system that prepares and stores the most important data. The watch-free bridge will function in open water for an initial period of eight hours under moderate environmental conditions.

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Picture 2: Visualization of an autonomous collision avoiding maneuver (© Fraunhofer CML)

Four building blocks are required for the implementation of B ZERO, which are to be developed over the next three years:

- AutoLookout: a sensor system that reliably detects, identifies and observes objects in the vicinity of the ship.
- AutoOOW (OOW stands for Officer On Watch): an intelligent navigation system that also implements certain navigation decisions according to predefined standing orders without the presence of a nautical officer on the bridge.
- Human-Machine Interface B ZERO - HMI (HMI for Human Machine Interface): cooperation and integrated processes between the watchfree nautical officer and the autonomous system, even during critical situations.
- Performance standard designs: rules for a later implementation of the developed technologies on an industrial scale.

The system is to be piloted from the beginning under real conditions. The MV Henrika Schulte (MOL GLIDE), a 5,600 TEU container freighter in Atlantic traffic, is available as a test ship, on which current prototypes are regularly installed and tested. Parallel to this, accompanying safety and human factor tests will be carried out as part of the ship handling simulation environment at the Fraunhofer CML.



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Picture 3: B ZERO test ship Henrika Schulte/ MOL Glide (© Bernhard Schulte Gruppe)

Further partners in the research consortium are the Bernhard Schulte Group, Wärtsilä SAM, Hoppe Bordmesstechnik, NautilusLog, the German Federal Institute for Maritime Navigation and Hydrography BSH and Fraunhofer FKIE. Bernhard Schulte Group provides the test ship and designs the technical and operational concept. Wärtsilä SAM develops the environmental sensors for the lookout, while Hoppe Bordmesstechnik will be responsible for developing the internal sensors and the trim position. The automatic documentation of the travels during the watchfree time in B ZERO is carried out with the electronic logbook of NautilusLog. The technical developments will be accompanied by the Bundesamt für Seeschifffahrt und Hydrographie BSH (Federal Institute for Maritime Navigation and Hydrography), which will deal with the validation and verification of semi-autonomous bridge systems as part of B ZERO. The navigation information for the bridge will be presented by Fraunhofer FKIE. The CML develops the nautical decision making and coordinates the project.

One thing is already certain: With the focus on the development of smart technologies and nautical assistance systems for maritime navigation and the improvement of safety at sea through the use of sensor technologies and data analysis, the findings gained within the framework of B ZERO offer potential for further exciting developments.

Work on the development of B ZERO starts in December 2019. The project is funded by the BMWi with 2.7 million euros.

FRAUNHOFER CENTER FOR MARITIME LOGISTICS AND SERVICES CML**The Fraunhofer CML**

The Fraunhofer Center for Maritime Logistics and Services CML develops and optimizes processes and systems along the maritime supply chain. Within practically oriented research projects CML supports public and private sector clients of port operations as well as from the logistics services industry and from the shipping business.

The Fraunhofer FKIE

The Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE develops technologies and processes with the aim of early identification, minimization and control of existentially threatening risks. In this context, research has focused for many years on the topic of "Maritime Systems". The work focuses primarily on safety-relevant issues relating to the ergonomic design of navigation systems and the protection and use of maritime systems and infrastructures.

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Fraunhofer-Gesellschaft

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