

Project members

The H2H project is coordinated by Kongsberg Seatex, a subsidiary of Kongsberg Maritime, developing solutions for maritime sensing and connectivity. Expert project partners include SINTEF Ocean and SINTEF Digital for broad research-based expertise; KU Leuven, a leading European university and expert on inland waterway navigation; and Mampaey Offshore Industries, a Dutch company specialising in towing, berthing and mooring systems.

The 3-year project started in November 2017 and will end up in three demonstrations using a H2H pilot. The demonstrations will be held in Trondheimsfjorden in Norway (simultaneous operation), in the Netherlands (auto-mooring operation) and in Belgium (inland waterway operations) during 2020.



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KU LEUVEN

mampaey
OFFSHORE INDUSTRIES

SINTEF



KONGSBERG

www.sintef.no/projectweb/hull-to-hull/

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HULL TO HULL

**Safe operations of vessels
in close proximity using
Galileo, EGNOS and 3D
vessel models**

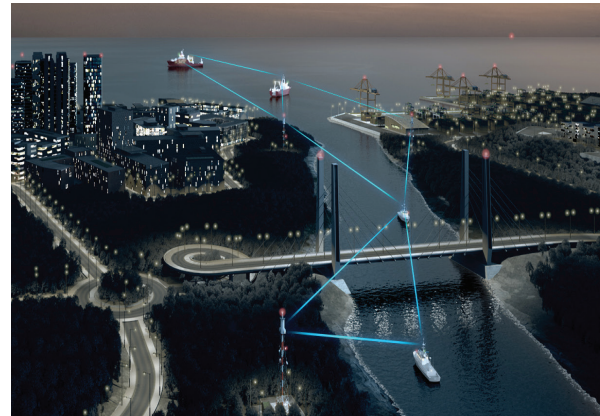
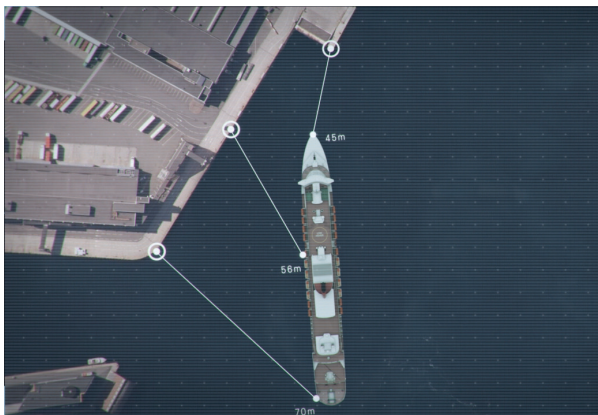


The Hull-to-Hull project

Concept

The overall objective of the Hull-to-Hull (H2H) project is to develop a concept demonstrating hull-to-hull positioning between two vessels or between shore and vessel. The concept will support safe navigation of vessels and objects which are in close proximity of each other. H2H will assist mariners in making correct navigation decisions.

The H2H approach will allow actors to establish proximity zones for own vessel as well as neighboring objects. The accuracy of the hull position is represented by a proximity zone. The hull position will be measured based on GNSS including relative Galileo, on EGNOS and other positioning methods such as laser and radar.



The H2H system combines GNSS with additional sensors and 3D models to establish digital twins representing vessels and other objects of interest. The digital twin will be used to provide crucial navigation information in real time. Visualization of the digital twin can be done in 3D view or in the form of 2D views using slices of the 3D model. Other examples of information that can be derived from the model are the closest distance and the relative velocity between vessels and objects. This information can be input to both traditional vessel control systems with human in the loop and autonomous systems.

Communication

Communication is a key part of the H2H concept. The communication link will primarily be used for exchange of 3D models, GNSS data and other sensor data. The H2H system should be able to use any wireless communication channel, as long as it provides the required capacity and reliability. However, there might be a necessity to add a safety and security layer, depending upon the communication channel that is used.

Open standard

H2H aims at being an open concept with standardized data exchange. Standardized data exchange will allow vessels and infrastructure with H2H equipment from different vendors, to work together. The project will propose a framework based on existing standards as far as possible, and also propose new or amended standards where needed.

