

December 12, 2023

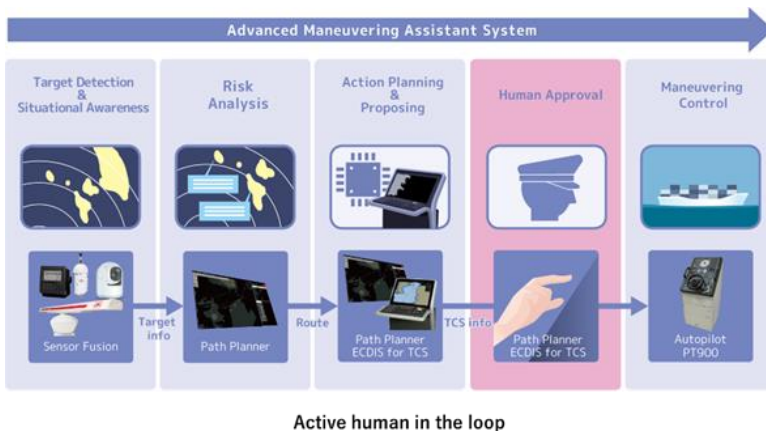
Kawasaki Kisen Kaisha, Ltd.

**Approval in Principle (AiP) from Japanese Classification Society ClassNK
for Advanced Maneuvering Assistant System**

Kawasaki Kisen Kaisha, Ltd. ("K" LINE) has been granted Approval in Principle (AiP) *1 from Nippon Kaiji Kyokai (ClassNK) for joint development of Advanced Maneuvering Assistant System, which is being developed in cooperation with Japan Radio Co., Ltd., YDK Technologies Co., Ltd. and KAWASAKI KINKAI KISEN KAISHA, Ltd. (Kawasaki Kinkai Kisen).

We have been in progress in the Joint Technological Development Program for the Demonstration test of Fully Autonomous Ships under the MEGURI 2040 Fully Autonomous Ship Project*2 (MEGURI2040) administrated by the Nippon Foundation.

Advanced Maneuvering Assistant System, the core technology of the autonomous navigation system, has been granted AiP from ClassNK.



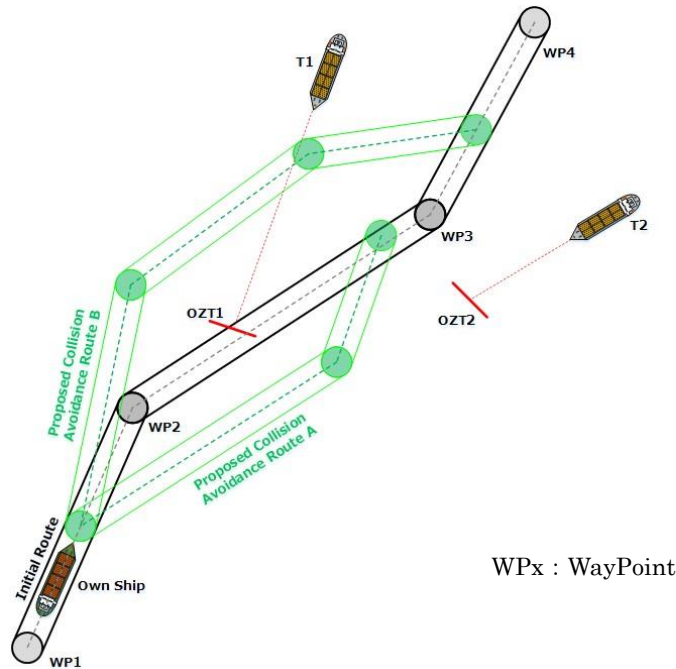
Background of approach

From 2021, we have been conducting joint research and development with Japan Radio Co., Ltd. and YDK Technologies Co., Ltd. for the Advanced Maneuvering Assistant System to assist the navigation in making accurate maneuvering decisions, and we are currently working on MEGURI 2040 using the technology developed through joint research and development.

In 2022, we have been conducting the system design targeting the existing large RORO cargo ship "HOKUREN MARU No. 2" operated by Kawasaki Kinkai Kisen. We have been collaborating with ClassNK in verification and validation for safety of the system, including the conditions of use and backup systems.

System summary

The Advanced Maneuvering Assistant System automatically generates some routes for avoiding a collision with other ships on a monitored route when a collision with another ship due to OZT*3 is predicted and assists the operator in avoiding the collision. The system will consider COLREGs*4 and suggest up to two avoidance routes that will allow the ship to return to its original course line within 1 hour. In addition, track control is performed for the selected avoidance route by linking the system with Auto Pilot and ECDIS*5.



Scene of proposing avoidance routes

We will continue to work with Japan Radio Co., Ltd., YDK Technologies Co., Ltd. and Kawasaki Kinkai Kisen to develop a comprehensive system that will contribute to the improvement of fully autonomous ships technology as the core technology with the Advanced Maneuvering Assistant System in order to realize the autonomous navigation system on the existing RORO cargo ship "HOKUREN MARU No. 2".

*1 AiP, which stands for Approval in Principle, is a scheme for the examination of plans and documents based on the rules for products in the early design stage to confirm their technical feasibility from the viewpoint of the rules.

Source : ClassNK

*2 A subsidization scheme to cultivate further momentum for technological development in the field of fully autonomous ships, promoting changes in logistics, economies, and social infrastructure in Japan, and supporting such technological development through the success of the world's first fully autonomous operation trials by domestic coastal vessels. We are participating as a member of the Designing the Future of Fully Autonomous Ships Plus

consortium (DFFAS+).



MEGURI2040 logo



DFFAS+ logo

*3 OZT : Obstacle Zone by Target

*4 COLREGs : International Regulations for Preventing Collisions at Sea

*5ECDIS : Electronic Chart Display and Information System

(Related Release)

November 27, 2023: The Nippon Foundation MEGURI2040 Fully Autonomous Ship Project
-Demonstration test of autonomous navigation system on large RORO cargo-

<https://www.kline.co.jp/en/news/csr/csr-20231127.html>

July 21, 2023: Participating in the Second Stage of the Nippon Foundation MEGURI2040 Fully
Autonomous Ship Project for Social Implementation

<https://www.kline.co.jp/en/news/csr/csr-20230721-1.html>

November 2, 2021: Starts Joint R&D on Integrated Navigation Support System Using AI
and Other Cutting-edge Technologies

<https://www.kline.co.jp/en/news/other/other-20211102.html>