

# KHI's Education, Training Program for KICS<sup>®</sup> Operators Certified by ClassNK 79

Contents

By Builder

By Ship Type

An education and training program for ship dynamic positioning system (DPS)<sup>\*1</sup> operators developed by Kawasaki Heavy Industries, Ltd. (KHI) has been certified by Nippon Kaiji Kyokai (ClassNK).

DPS-equipped vessels are playing more and more important roles in offshore construction projects requiring highly accurate work, such as those for generating electric power with wind and other renewable energy. The education and training program certified by ClassNK is designed for the operators of the Kawasaki Integrated Control System (KICS<sup>®</sup>)<sup>\*2</sup>, which has also been developed by KHI. The program is made up of classroom lectures, onshore training with simulators and on-board training. Those completing it receive certificates endorsed by both KHI and ClassNK. By providing systematic education and training to KICS<sup>®</sup> operators, the program contributes to improving the safety and reliability of domestic offshore construction projects in Japan.

KICS<sup>®</sup> is available in two series: the DPS series for self-elevating platform (SEP) vessels<sup>\*3</sup>, cable layers and others engaged in specialized operations and the joystick ship operation series for ferries, roll-on/roll-off (Ro/Ro) ships<sup>\*4</sup> and others having more than one propulsion systems. To date, KICS<sup>®</sup> has been employed on board more than 100 vessels in total.

As a ship propulsion system integrator, KHI continues to work to realize safe and secure maritime mobility by providing propulsion system packages suitable for all types of vessels.



**Certification ceremony**

- \*1 A dynamic positioning system (DPS) helps detect hull conditions with the global positioning system (GPS) and other sensors and automatically control propulsion systems and rudders so as to keep hulls from currents, winds, waves and other external factors and in designated positions.**
- \*2 The Kawasaki Integrated Control System (KICS<sup>®</sup>) helps collectively operate several systems, such as variable-pitch propellers, rotating thrusters, side thrusters and rudders. Refer to: <https://www.khi.co.jp/mobility/marine/machinery/kics.html>.**
- \*3 A self-elevating platform (SEP) vessel has both a platform and a self-elevating system. A platform is lifted above the sea surface with a self-evaluating system, on which crane and other operations are made. It is mainly deployed for installing offshore windmills and other tasks.**
- \*4 A roll-on/roll-off (Ro/Ro) ship a type of cargo freighter that has boarding ramps as ferries do and a deck for accommodating automobiles and other commodities.**



**KICS<sup>®</sup> simulator**

# Dynamic Positioning System 80

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Recently, automatic ship's maneuvering controlling technology is used in various operation at sea not only offshore development of natural resources. Since the first DPS was installed in 1985, MES has developed and installed Automatic Position Control Systems, including DPS and Joystick Control System, in over 120 ships. As one of the DPS operational technology developments based on these achievements, we developed a function to support vessel operation during fishing operations, including surveys and observations of fishery resources in the fishery field, and actually installed the function on board a vessel to demonstrate its capability. The following three fishing operations were targeted for development in this project.

- Maneuvering the vessel to track detected schools of fish
- Maneuvering at low speed for long periods of time during bathymetric surveys
- Maneuvering during fixed-point oceanographic observations at depths exceeding 2,000m

First, for tracking fish schools, the system automatically controls the speed and bow direction of the vessel while



Figure 1: Suruga Maru

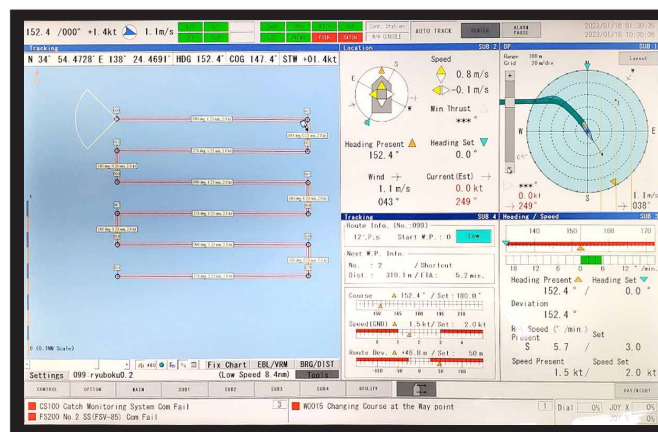


Figure 2: Operation Screen of Low Speed Tracking for Seabed Survey

maintaining the relative position to the fish schools detected by the fish detection system, thereby reducing the operator's burden on the vessel. Next, for low-speed operation during underwater and seafloor surveys, the system controls the position, speed, and bow direction with high precision, taking into account the effects of external disturbances on the pre-planned route, thereby greatly reducing the burden on the operator over a long period of time. The system is also designed to be used in deep water. In addition, the system automatically controls the vessel's position and bow direction over a long period of time while monitoring the relative position of the vessel and the observation equipment in the water under the influence of currents, wind, waves, and other disturbances, thereby improving the efficiency of the survey work.

The DPS with these functions was installed on

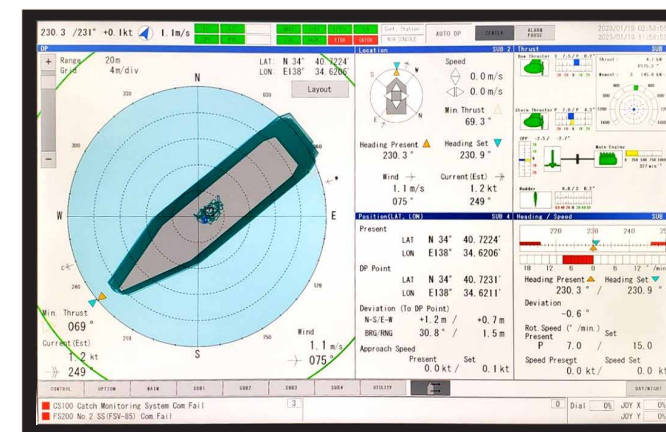


Figure 3: Operation Screen of Automatic Position and Heading Keeping

the Shizuoka Prefecture's fisheries research and guidance ship "Suruga Maru" shown in Figure 1 to adjust the performance and demonstrate the functions of each function. The vessel has an overall length of 41.92 m, an overall width of 7 m, and a displacement of 188 tons. Figure 2 and Figure 3 show examples of the DPS operation screenshots of the automatic tracking maneuver for the planned route, and Figure 3 shows an example of the automatic ship's position keeping maneuver when the CTD (Conductivity Temperature Depth Profiler) was applied to a depth of 2,000m. Figure 3 shows the operation screen of the automatic vessel position keeping maneuver when the CTD (Conductivity Temperature Depth Profiler) was deployed to 2,000m depth. Based on these achievements, we intend to further develop systems to achieve a high degree of automation of various vessel operations in the fishing industry, to reduce the burden of vessel operation on operators, and to improve efficiency while ensuring the safety of operations.

# Shin Kurushima Sanoyas Shipbuilding manufacture LNG Fuel Tank 81

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Shin Kurushima Sanoyas Shipbuilding Gas Tank Division designs and manufactures various cargo and fuel gas tanks. Recently, we have been manufacturing LNG fuel tanks to be installed on Pure Car Carrier built at the Shin Kurushima Dockyard. This is first large LNG fuel tank using 9% nickel steel in Japan.

Our company has a wide range of experience and achievements that have been accumulated for many years in LPG cargo tanks manufacturing. Furthermore, we constructed a new insulating shop for insulation work, which is an important factor of cryogenic LNG tanks, and has an organizational structure in consideration of continuous manufactur-

ing. In addition to LNG fuel tanks, we are also conducting research and development on ammonia tanks and LCO<sub>2</sub> tanks, which are expected to be in demand as alternative fuels and transportation in the future. We design and manufacture a wide variety of marine gas tanks to meet the diverse needs of our customers.