Dynamic Positioning System `80`

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
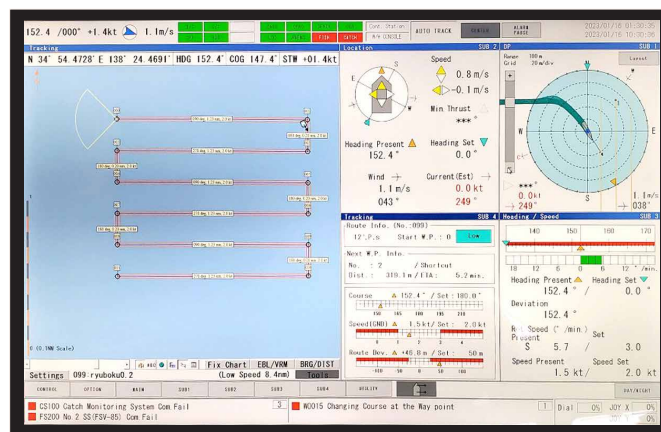

Figure 1: Suruga Maru

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.

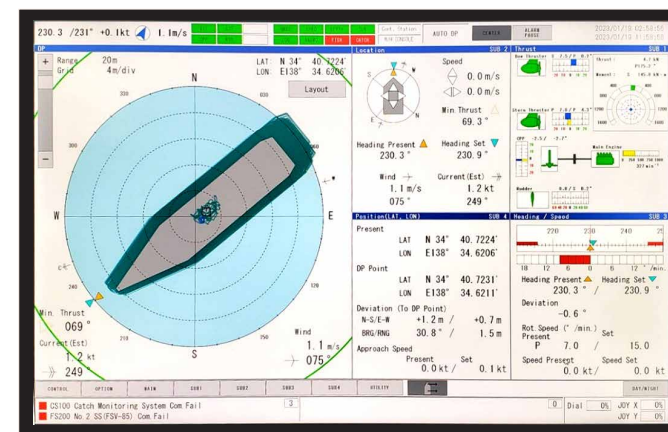The DPS with these functions was installed on

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.