Dynamic Positioning System for FT400 Crane Barge (Non-Self Propelled)

The "FT400," developed by Fudo Tetra Corporation and built by Fuji Kaiji Kogyo Co., Ltd., was delivered in March 2025. This next generation dredging and crane barge integrates advanced environmental performance, safety, operational efficiency, and crew's comfort. Fig.1 and 2 show the external appearance and the general arrangement of FT400, respectively.

The vessel incorporates a battery-based power system designed to reduce the number of onboard generators and minimize CO_2 emissions. Notably, it is the first non-self-propelled barge in Japan to be equipped with a Dynamic Positioning System (DPS), for which our system was adopted. Fig.3 shows the DP Console.

Fig. 1 External Appearance

This DPS equipped the following key features:

- Four electrically driven pump jet thrusters (rated thrust: approx. 20kN each) are installed on the hull bottom, enabling efficient thrust generation in any direction and allowing anchorless position keeping against external forces such as currents, wind, and waves.
- The system has been assessed by Class NK (Nippon Kaiji Kyokai) as equivalent to DPS Class-1, marking the first such assessment for a push-type barge in Japan.
- A feedforward control function is implemented to compensate for the rotational moments generated during crane slewing operations with heavy buckets, thereby it becomes possible to minimize the impact on the vessel's motion.
- The system is operated using joysticks, dials, and button switches, and features a large touch-panel LCD to enhance usability.
- A dedicated monitor is installed at the crane operator's station to enable real-time monitoring of DPS operations, facilitating information by sharing between the bridge and crane control stations.

Furthermore, the DPS supports very low speed automatic tracking along predefined routes with high precision, making it suitable for a wide range of marine engineering applications, including port development works.

In addition, the vessel is equipped with AI-based navigation assistance and ICT-based construction support systems. It also features land-based power supply capabilities for emergency scenarios and includes a convertible onboard shelter space, which can be rapidly transformed into an evacuation facility. These attributes position the FT400 as a critical asset for future marine construction and disaster response operations.

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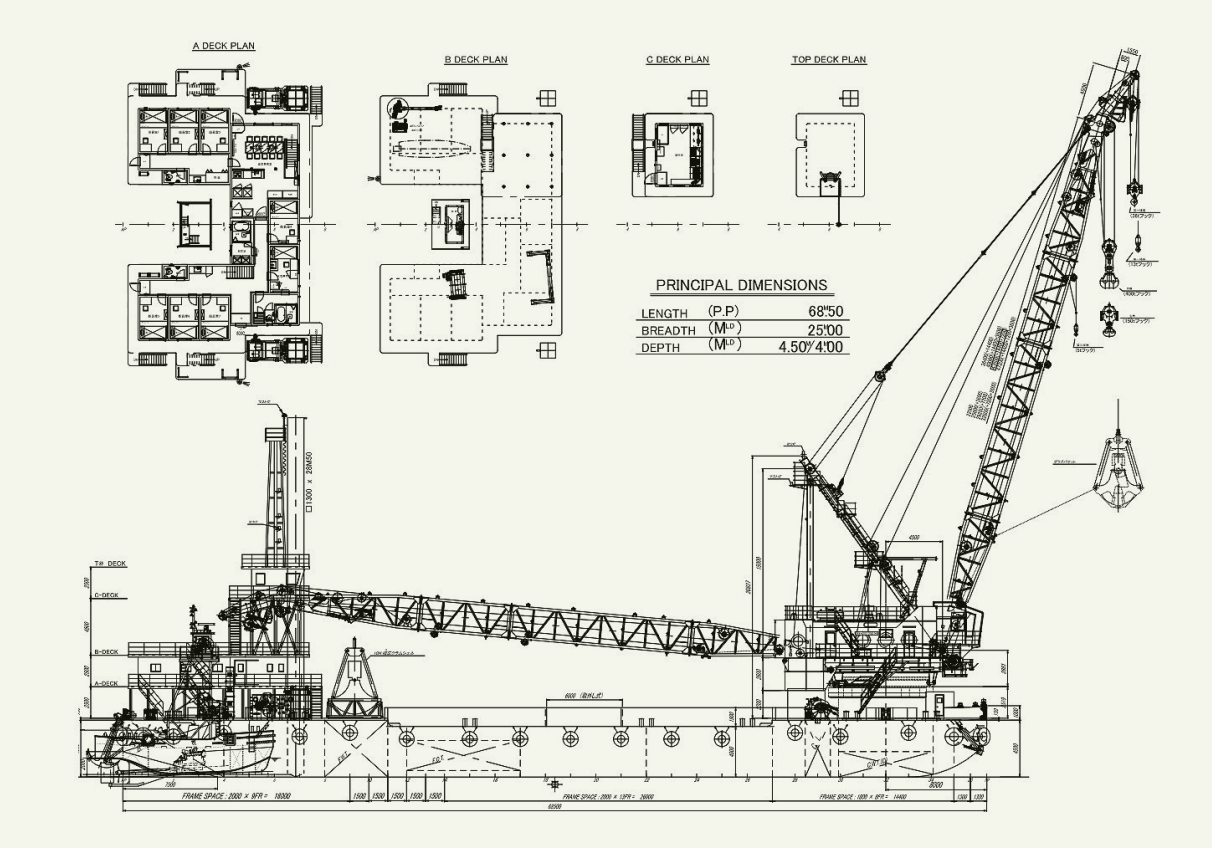

Fig. 2 General Arrangement

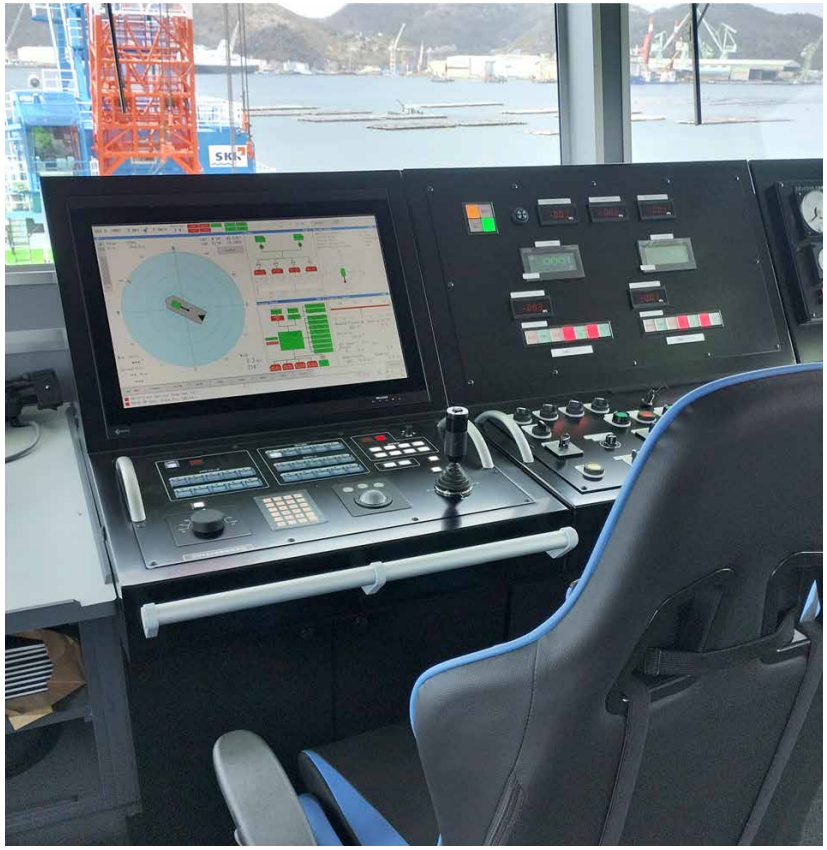

Fig. 3 DP Console

PRINCIPAL PARTICULARS

Length (o.a.) ..... 68.5 m : Crane Barge
Length (b.p.) ..... 68.5 m : Crane Barge
Breadth (mld.) ..... 25.0 m : Crane Barge
Depth (mld.) ..... 4.5 m : Crane Barge
Draft (mld.) ..... 1.314 m (Light Weight) : Crane Barge
3.747 m (Full Load) : Crane Barge
Gross tonnage ..... 2,033 ton : Crane Barge
Deadweight ..... 4,011 ton : Crane Barge
Main engine ..... 837 kw (1,138PS) x 2 : Pusher Ship
MCR (kw x rpm) ..... 837 kw x 1450 min-1 : Pusher Ship
Speed (max. trial) ..... 9.5 knots : Pusher Ship
(service) ..... 9.0 knots : Pusher Ship
Complement ..... 12 : Pusher Ship
Classification ..... JG : Pusher Ship
Handling gear ..... all-around traverse Crane : Crane Barge
Loading capacity ..... Crane Lifting Capacity 400 ton : Crane Barge
Builder ..... Fuji Kaiji Kogyo Co., Ltd. / SKK Corporation