

H389

Ice going Multipurpose Vessel (MPV) Integrated Automation System

The H389 Ice going multipurpose (MPV) is a DYNPOS-3 vessel built at Keppel Singmarine shipyard in Singapore. This vessel is equipped with the ABB Medium Voltage Power and Propulsion System.

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ABB supplied the integrated automation system (IAS) and power management system based on the ABB Ability System 800xA. In order to comply with AUT1 notation, ABB also supplied the dead-man and extension alarm systems.

To comply with DYNPOS-3, ABB provided redundant star configuration of the integrated automation system. The IAS is equipped with redundant servers, PLCs, networks, communication interfaces and power supplies. The vessel is also equipped with remote redundancy functionality from the AC800M hardware. This functionality enables remote I/Os to be connected to redundant PLCs located in different physical locations, so that the loss of one PLC due to failure, fire or flood has no effect on the RIO.

The ABB power management and integrated automation system is based on high performance HMI developed by ABB Marine. ABB high performance HMI provides:

- Fast access to key information
- Quick and easy navigation of the mimics without losing the overview
- Improved operator situational awareness and enhanced response
- Clear dynamic indications
- Harmonic and hierarchical layout
- Day, high contrast, and night colour palettes

The power management system and integrated automation system supplied by ABB is based on ABB MAPL (Marine Automaton Platform Library). The power management system (PMS) is the foundation of the vessel's combined power and control system, used for fast responses on critical actions. The PMS is integrated into the 6.6 kV switchboards. Installation of power management inside the switchboards is very advantageous as it reduces footprint and PMS commissioning time. Integrating the PMS with the switchboard with IEC61850 enabled relays reduces amount of cabling inside switchboard. IEC61850 enables fast communication between the switchboards and the PMS.

Some of functionality of the PMS provided on the vessel:

- Automatic load dependent start/stop
- Isochronous/droop load sharing
- Symmetric and asymmetric load sharing
- Automatic load shedding

- Mode selection
- Dynamic load reduction
- Heavy consumers

The integrated automaton system supplied by ABB provides seamless integration of process control and power control. Integrated automation is based on ABB's MAPL. It is used to efficiently manage control, monitoring and alarms of the entire ship's marine systems, including bilge, ballast, seawater and freshwater cooling systems, anti-heeling systems, main engines, propulsion systems, and more.

The IAS is also interfaced to many third-party systems like the main engines, emergency engines, fire detection system, anti-heeling system, bridge alarm monitoring system, ship emergency switchboards, fire door monitoring system, thrusters, remote control valve and tank gauging system, using various industrial protocols like Modbus RTU, Modbus TCP/IP and profibus.

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