

SeaONYX* Surface Control System

Powered by Mark* Vle Control Technology

Pressure Control Equipment: Blowout Preventers

GE's next-generation SeaONYX blowout preventer (BOP) surface control system and operator interface improve maintenance and support while addressing the challenge of obsolescence management.

Designed for offshore drilling operations, the SeaONYX system utilizes GE's proven Mark* Vle hardware and Proficy* software tools, which have been applied in a wide range of thermal, wind, hydro and nuclear facilities. With more than 2,000 installations worldwide, and over 400 additional deployments every year, GE's Mark Vle technology offers a large support network for the system's hardware and software. The SeaONYX system takes advantage of GE's obsolescence management program for Mark Vle components for long-term system support.

The SeaONYX system's Mark Vle control platform addresses obsolescence management by using a standard footprint for the I/O packs and the controller. When an I/O pack becomes obsolete and one of these components reaches its end of life (EOL), form fit and function replacements will be made available.

Benefits

- Decreased repair time – System controllers and I/O modules can be individually replaced online without disturbing the rest of the system. I/O modules are auto-configured by the system.
- High performance – With a local processor on each I/O module, computer power grows as the system expands.
- Flexible – I/O modules are distributed individually.
- Compact – The system uses redundant single-board processors and redundant communications to HMI and I/O networks.

- Robust – The controller and I/O modules are rated –30°C to 65°C with no fans, and each module has an on-board temperature sensor.
- Versatile networks – The system is 100 percent Ethernet at all levels.
- Reliable communications – Redundant network ports are found on each I/O module.



Yellow CCU Input/Output, Yellow CCU Processor/Communication, Engineering Workstation

Controller Features

Based on a singleboard controller with built-in power supplies, the controller requires no batteries or jumper settings.

In addition, the SeaONYX control system has no single point of failure that will cause the system to lose control.

Performance

The SeaONYX control system is designed for high-speed, reliable performance in the demanding offshore environment. Configured for dual redundant operation, it uses hot swappable modules to decrease downtime.

Control Network

10/100 MB/s Ethernet ports with an RJ 45 connector are used for peer-to-peer communication with the control network and operator stations. TCP/IP and EGD protocols are used for communication on the control network. Two additional 10/100 MB/s Ethernet ports with RJ 45 connectors are used for communication with I/O packs.



I/O Features

The I/O modules are capable of online replacement and autoreconfiguration for improved availability. Additionally, no wiring needs to be removed to replace the I/O packs, which are offered as digital and analog interfaces for advanced flexibility in configuring and maintaining the system. Finally, these “Smart I/O” modules are capable of self-diagnostics.

Controls Programming

The SeaONYX software application is based on GE’s ControlST* software suite and is used for configuration and monitoring of application code and alarms/diagnostics.

The control software can be edited and downloaded without the need to stop the controller. This software is represented in block diagram format with Boolean logic shown in ladder format. Sequential function charts conforming to IEC 61131-3 standards also are available.

Control Specifications

Configuration:	Dual
Speed:	600 MHz
Cooling:	Convection
Ports:	5 Ethernet, 1 USB, 1 COM
Voltage range:	18 to 32 V dc
Operating:	-30 to 65°C (-22 to 149°F)
Diagnostic LEDs:	Link, Act, Power, Online, Flash, DC, Diagnostic, On, OT
Storage:	-40 to 85°C (-40 to 185°F)
Humidity:	5 to 95%, non-condensing
Certifications:	DNV

References

API 16D
DNV-OS-D201



HMI Software

The SeaONYX HMI software is based on GE’s WorkstationST* and GE Intelligent Platforms’ Proficy Cimplicity* tools. The interface smoothly integrates the touchscreen displays to provide a highly effective and efficient operator experience, and it allows for management of all system functions, alarms and events.



Toolpusher's panel

Several privilege levels are standard: “Administrator” or “Maintenance” allows the user to right-click to display a menu for navigation to related variables and alarms, “Operator” is able to perform daily operations, and “Viewer” only has viewing access.

Engineering Workstation

The SeaONYX Engineering Workstation is based on Proficy Historian software, which collects and archives data at high speeds, sending it to an electronic archive as well as a printer, if desired.

With its powerful compression algorithms, the Historian software enables easy and secure storage of years of online data to enhance performance, reduce maintenance and lower costs. Time series data archives can be automatically created, backed up, and purged without the need for a database administrator.

The Proficy Historian software forms the backbone of a powerful platform that will enable future applications to be implemented that can include advanced monitoring, diagnostics and predictive analytics.

Built for Cyber Security

- Each HMI and switch port is hardened to reduce potential tampering or unwanted network connections
- Only essential applications are installed
- Mark VIe controller is Achilles certified
- Each HMI comes configured with backup and anti-virus software installed. Updates are available by subscription and can be installed as the rig operating schedule dictates.

For additional information refer to the OM-MUX-SWM Operators Manual.

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