



AUTOMATION SYSTEM - JACKING MONITORING & ALARM MONITORING SYSTEM

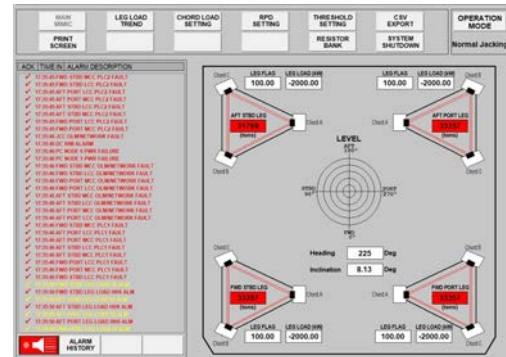
The Jack-up Rig Monitoring System (JMS)

is designed to oversee jacking operations for rigs with 12, 18, or 24 motors, incorporating comprehensive emergency safety features for the entire jacking system. The JMS includes consoles that integrate seamlessly with existing Jacking Motor Control Centers (MCCs) and interface with jacking hardware. It monitors critical parameters of jacking units using Programmable Logic Controllers (PLCs).

The HMI Software application is utilized in the JMS for its user interface, providing seamless interaction with the monitoring system and ensuring fault tolerance through redundancy.

Typical Network Design:

The network design for the JMS generally includes Profibus, Profinet, and a fiber optic ring system to facilitate robust and reliable communication.



Typical Parameters Monitored in JMS:

RPD Monitoring:	Tracks the Riser Position Device for accurate positioning.
Chord Load Monitoring:	Measures and monitors load on the chord components.
Alarm Monitoring:	Provides real-time alerts for system alarms.
Motor Current Monitoring:	Monitors current consumption of motors.
RPD Trending:	Analyzes trends in Riser Position Device data.
Chord Load Trending:	Tracks trends in chord load measurements.
Leg Flag Monitoring:	Monitors the status of leg flags for position verification.
Leg Load Monitoring:	Measures and tracks loads on the legs.
Inclination Monitoring:	Measures the inclination angles to ensure stability.
Data Export:	Facilitates the export of monitored data for further analysis.

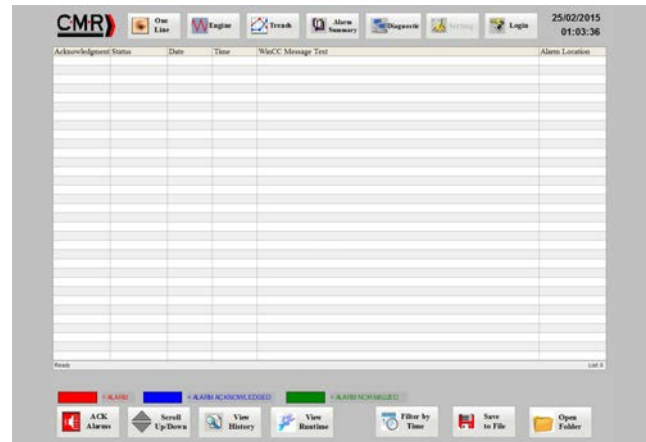
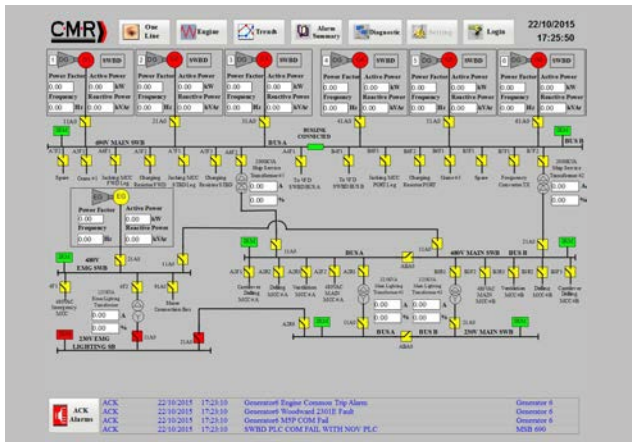
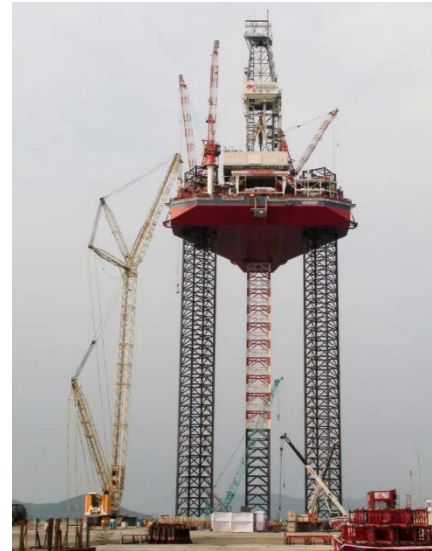


AUTOMATION SYSTEM - POWER MANAGEMENT SYSTEM

The Power Management System (PMS) oversees the power demand and supply for routine operations on jack-up rigs, such as drilling, jacking, and hoisting, in challenging offshore environments.

Typical PMS Components:

Hot Standby PLC	Ensures continuous operation with redundancy.
Remote I/O (RIOs)	Provides distributed input and output control.
Industrial PC	Centralizes processing and control.
Keyboard and Touchscreen	For user interaction and system management.
Local HMI Panels	Offer localized control and monitoring.
Load Sharer	Balances electrical load across the system.



Features & Functions of PMS

Load Sharing	Distributes electrical load efficiently across multiple generators.
Priority Start of Standby Genset	Ensures standby generators start in the correct sequence based on priority.
Breaker Status Monitoring	Tracks the status and operation of breakers.
Power Monitoring	Measures key parameters including kilowatts (kW), voltage (V), current (A), and power factor (PF).
Alarm Monitoring	Provides real-time alerts and notifications for system alarms.
Engine Status Monitoring	Monitors and reports on engine performance and condition.
Network Diagnostics	Performs thorough diagnostics of network health and performance.
Integration with LV System	Seamlessly integrates with low-voltage systems for cohesive operation.
Interface with Drilling System	Interfaces with drilling systems for coordinated power management.

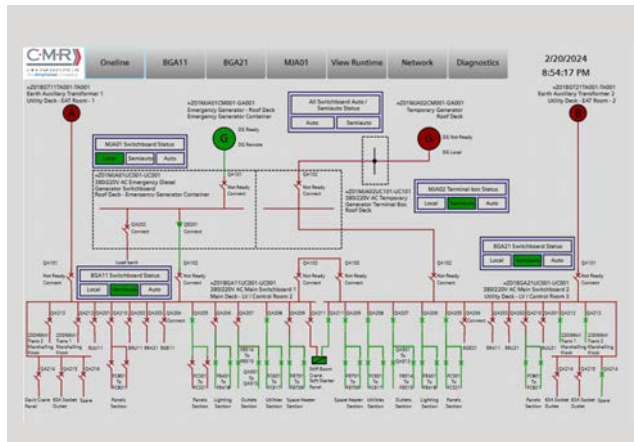


AUTOMATION SYSTEM - WINDFARM SUBSTATION SYSTEM

The Wind Farm Substation Power Management System (WFSS) manages power distribution to the substation, ensuring continuous power availability to the wind farm throughout power production, even under various power interruption conditions.

Typical Setup

Hot Standby PLC	Provides redundancy for uninterrupted operation.
Remote I/O (RIOs)	Facilitates distributed control and monitoring.
Touchscreen HMI	Offers an intuitive interface for system interaction.
Operation Technology Security	Adheres to stringent network and program security protocols in compliance with IEC 62443.



Features of WFSS

Scenario Switching	Automated switching based on predefined conditions.
Breaker Status Monitoring	Continuous monitoring of breaker positions and status.
Power Monitoring	Measurement of kW, voltage (V), current (A), and power factor (PF).
Alarm Monitoring	Real-time detection and reporting of system alarms.
Engine Status Monitoring	Tracking and reporting of engine performance and status.
Network Diagnostics	Comprehensive network health and performance diagnostics.
RTU/SCADA Integration	Seamless interface with Remote Terminal Units (RTUs) and SCADA systems.



COMMON SOFTWARES & COMMUNICATION PROTOCOLS USE IN AUTOMATION SYSTEM

