

ATEX Explosion-Proof Control System Advancing Safety and Digitalization on Offshore Drilling Platforms



Industry: Energy

Region: Europe

The Challenge: Demanding Offshore Operations

Offshore drilling platforms represent some of the most punishing environments in the global energy sector. Operating 24/7, these facilities face relentless environmental and operational stressors, including:

- **Environmental Extremes:** Constant exposure to high humidity, salt mist, heavy waves, severe vibration, and drilling mud contamination.
- **Explosive Risk Profiles:** Near drilling zones, mud circulation systems, pump rooms, and data acquisition areas, the co-existence of flammable oil/gas vapors and electrical ignition risks is a constant hazard.

Key Deployment Obstacles

When deploying control systems in these environments, operators typically face three major challenges:

1. **Safety & Regulatory Compliance:** Equipment used in hazardous zones must strictly comply with rigorous standards, such as **ATEX Zone 2** or **Class I Division 2 (C1D2)**, to ensure electrical components never become ignition sources.
2. **Environmental Reliability:** Systems must withstand corrosion, vibration, and

moisture. Any HMI failure or telemetry interruption risks creating critical operational blind spots.

3. **Complex System Integration:** Platforms simultaneously run complex webs of PLCs, sensors, data acquisition modules, and isolated power systems. Without a ruggedized HMI and stable connectivity, real-time visualization drops, while troubleshooting and maintenance costs soar.

The Solution: WTPE Series as the Core Control Node

The **WTPE Series**—an ATEX Zone 2 and C1D2 certified explosion-proof panel PC platform—acts as both a rugged human-machine interface (HMI) and an edge control node. Designed for hazardous areas, it provides a secure, stable platform for drilling control, mud monitoring, pump management, and field data aggregation.

Flexible Deployment Options

To accommodate varying space constraints and visibility requirements across the platform, the WTPE Series features three distinct display sizes:

- **21.5-Inch Model:** Optimized for main operating stations and comprehensive drilling control rooms. The expansive screen allows operators to monitor complex process diagrams, historical trend curves, and active alarm windows simultaneously.
- **19-Inch Model:** Designed as a standard field control interface, offering an ideal balance between viewable screen real estate and cabinet integration flexibility.
- **15-Inch Model:** Engineered for space-constrained environments, local equipment panels, or auxiliary monitoring nodes.

This diverse lineup enables a unified, multi-point HMI architecture, ensuring that every deployment zone operates on consistent logic and identical data sources.

Technical Architecture & Field Integration

During active drilling operations, the WTPE Series integrates seamlessly within hazardous ATEX Zone 2 areas, serving as the central visualization endpoint for critical field equipment:

- **Control & Logic:** Connects directly to drilling PLCs responsible for system logic, pump start/stop operations, equipment interlocking, and safety shutdowns.
- **Data Acquisition (DAQ):** Gathers telemetry from data acquisition units and ATEX-certified sensors monitoring real-time pressure, temperature, rotational speed, flow rates, and mud density.

- **Electrical Isolation:** Interfaces with isolated power supplies to mitigate the risks of electrical noise, voltage surges, and grounding anomalies common on offshore grids.

Operational Value: Unified Edge Integration

Positioned at the intersection of operational technology (OT) and upper-level management networks, the WTPE Series bridges the gap between raw field data and actionable insights.

By executing localized monitoring software, the platform delivers real-time trend charts, equipment health diagnostics, safety interlock statuses, and immediate alarm notifications directly to personnel in the hazard zone. This localized intelligence removes manual data-interpretation delays, eliminates information silos, and significantly elevates safety and operational efficiency across the platform.

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