Successful Fire & Gas System Modernization on a North Sea Offshore Platform

Upgrading Critical Safety Systems While Minimizing Operational Impact

Facing aging infrastructure and space constraints, a seamless modernization of a Fire & Gas safety system on a North Sea offshore platform was executed without interrupting production. The project employed a strategic retrofitting approach, replacing obsolete components while retaining functional safety-critical hardware. Pre-assembled, factory-tested systems minimized on-site installation time, and existing infrastructure—like mounting frames and wiring—was reused to optimize space and reduce costs. The phased upgrade included flexible interface options to align with operational needs resulting to zero downtime, enhanced system reliability, reduced maintenance costs, and full compliance with safety standards. By balancing innovation with cost-efficient reuse, the project delivered a future-proof safety solution that prioritizes operational continuity and long-term risk mitigation.

Challenges

+ Obsolete Components: Aging ICS-2000 I/O subsystems and Alarmed Fuse Terminals (AFTs) with high failure rates.

+ Space Constraints: Limited physical space in existing cabinets for new hardware.

+ Complex Integration: Hardwired matrix panels and interdependencies between Fire & Gas and ESD systems.

+ Legacy Wiring: Risks associated with reusing or rerouting short ELCO multicore cables.

Key highlights

+ Reduced operational impact through pre-assembled, factory-tested hardware.

+ Retained critical infrastructure (Trusted TMR controllers, matrix power supplies) to reduce costs.

+ Flexible matrix upgrade options allowed phased modernization without disrupting operations.

+ Future-proofing by replacing obsolete components (ICS-2000 I/O, AFTs, watchdog relays).

+ Space optimization using existing swing frames and pre-wired plates.

Solution

The project team developed and executed a comprehensive upgrade strategy that prioritized system reliability while minimizing operational disruption. At the core of the solution was a strategic retrofitting approach to component selection, where obsolete ICS-2000 I/O chassis, modules, and power supplies were replaced while retaining functional components such as Trusted CPU/Communications modules and matrix I/O infrastructure. New power supplies and modern field termination assemblies were implemented to enhance system reliability.

The success of the implementation hinged on extensive pre-assembly and testing procedures. Equipment assemblies were pre-assembled and tested in the factory, allowing for thorough validation before site delivery. This approach significantly reduced on-site installation time and risk.

The installation strategy made efficient use of existing infrastructure by reusing swing-frames for mounting new equipment and implementing pre-wired equipment sheets for rapid installation. Where possible, existing field wiring was used including the strategic reuse of input terminals was maintained to further reduce installation time and complexity. To address operator interface requirements, the solution included four flexible upgrade paths for the hardwired matrix panels. These options ranged from retaining the existing matrix with interface modifications to updating original panorama HMI package, allowing for a phased approach to modernization based on operational requirements and budget constraints.

Result

The modernization project achieved remarkable success across multiple dimensions. The live migration was completed ensuring zero downtime for platform operations. The elimination of obsolete components significantly enhanced system reliability while reducing both failure risks and maintenance costs. The flexible matrix upgrade options provided a scalable approach to modernization, aligned with operational requirements. The project maintained rigorous safety compliance through comprehensive testing of interlocks with the ESD systems. Cost efficiency was achieved by strategically retaining functional Trusted controllers and matrix infrastructure. The platform's Fire & Gas Detection System now operates with modernized, reliable I/O subsystems, ensuring long-term operational safety and compliance while preserving production uptime.