Success Story

Hurricane Evacuation Remote Operation (HERO)

Industry:	**Offshore Oil & Gas**
Plant type:	**Deepwater Production Platform**
Project type:	**Remote Operations Enablement**
Scope:	**System of Systems Integration**

Application

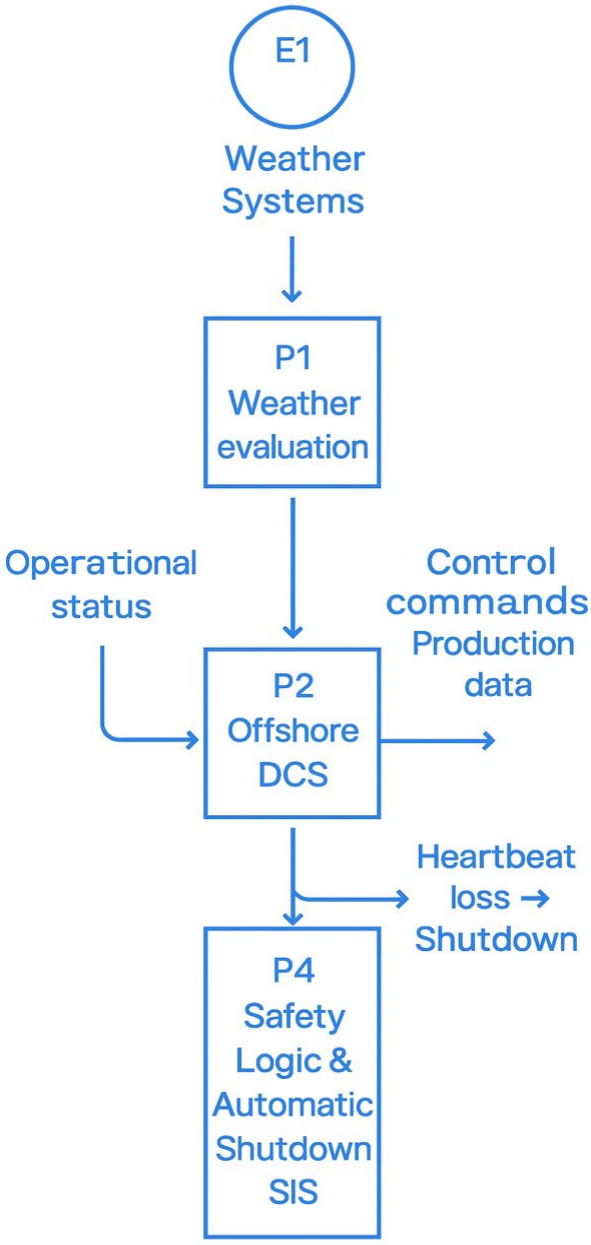
Hurricane evacuation remote monitoring and control to enable safe, compliant unmanned offshore operations

Executive Summary

A major oil company operates deepwater production platforms in the Gulf of America, where hurricane threats require mandatory evacuations several times each year. These evacuations often result in prolonged production shutdowns, leading to significant operational disruption and lost output.

To address this challenge, Yokogawa implemented the Hurricane Evacuation Remote Operation (HERO) solution at an offshore platform. Built on a validated System of Systems (SoS) architecture, HERO enables secure, fully remote monitoring and control of offshore production systems during evacuation periods while maintaining rigorous safety integrity and regulatory compliance.

By allowing operations to respond dynamically to changing storm conditions, HERO helps avoid unnecessary shutdowns, enhances personnel and asset protection, and strengthens overall operational resilience. The solution also establishes a robust foundation for the long-term transition toward autonomous and unmanned offshore operations, enabling safer, more flexible, and more efficient production in extreme weather environments.



Risk Mitigation Strategies

- ✓ Safety & Protection
- ✓ Asset Preservation
- ✓ Business and Production Continuity

Safety Assurance & Compliance Highlights

- ✓ Fail-safe design supporting deterministic transition to a safe state
- ✓ Validated safety logic for loss-of-communication scenarios
- ✓ Successfully demonstrated to BSEE for offshore safety compliance
- ✓ Comprehensive audit trail and event logging for verification and traceability

Operational Resilience & Production Continuity

- ✓ Evacuation-Related Production Loss Mitigated
- ✓ Automatic Safe Shutdown on Communication Loss
- ✓ Conditions Verified & Communications Restored
- ✓ Authorized Remote Restart
- ✓ Production Resumes Safely

Solution: Seamless System Integration

Yokogawa integrated CENTUM™ and ProSafe-RS Integrated Control and Safety Systems (ICSS) with redundant OPC clients (Matrikon Tunneller and Explorer) into a secure, bidirectional communication backbone. This System of Systems (SoS) architecture unifies production, safety, and weather systems into a single, cohesive operational environment, enabling reliable data exchange and coordinated control.

Remote Operations & Control

Authorized onshore personnel can securely monitor and control offshore production systems from multiple workstations. This capability maintains operational continuity and situational awareness even when the platform is fully evacuated due to hurricane conditions.

Heartbeat Monitoring & Automated Safety Logic

Continuous OPC heartbeat supervision provides communication integrity monitoring between the offshore platform and onshore facilities. If connectivity is lost beyond a predefined duration (typically several hours), the integrated safety system automatically initiates a predefined safe shutdown sequence. This autonomous response ensures the platform transitions to a safe state without operator intervention, protecting personnel, assets, and the environment during evacuation scenarios.

Compliance & Regulatory Validation

HERO is formally incorporated into the annual operations Standard Operating Procedure (SOP) testing program, providing ongoing verification of system performance, functionality, and procedural compliance. The solution has been successfully demonstrated to the U.S. Bureau of Safety and Environmental Enforcement (BSEE), confirming reliability, repeatability, and regulatory acceptance for safety-critical offshore applications.

Results

The company can now avoid unnecessary hurricane-related production shutdowns, saving weeks of lost production annually. Safety performance is enhanced through autonomous, predefined shutdown logic, ensuring the platform transitions to a safe state without reliance on operator intervention during evacuations.

Operational resilience is strengthened through real-time remote monitoring and control, enabling continued situational awareness and controlled response during extreme weather events. As a result, the platform is now capable of safe, compliant unmanned operation during mandatory hurricane evacuations, supporting both regulatory requirements and long-term operational continuity.

Systems Used

- Yokogawa System of Systems architecture
- CENTUM™ Integrated Production Control
- ProSafe-RS Safety Instrumented System
- Matrikon OPC Tunneller and Explorer

Future Outlook

The HERO architecture is currently being evaluated for deployment on another offshore platform and across additional Gulf of America assets, providing a scalable foundation for resilient, unmanned offshore operations.

Yokogawa Electric Corporation

YOKOGAWA ELECTRIC CORPORATION
World Headquarters
9-32 Nakacyo 2-chome, Musashino-shi, Tokyo 180-8750, Japan
http'//www.yokogawa.com/