

Real-time Behavioral Safety and Digital Risk Control in Offshore Drilling

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Objectives/Scope: This paper presents ARO Drilling's proactive safety strategy centered around the ARO Behavior Center (ABC) and its broader digital safety ecosystem. Focused on mitigating the high-risk environment of offshore drilling—especially amid ARO's ambitious newbuild program—the initiative combines real-time behavioral monitoring, structured digital processes, and satellite-enabled communications to improve procedural discipline, operational consistency, and frontline risk awareness.

Methods, Procedures, Process: ARO established the ABC to monitor critical rig activities in real time, particularly those involving suspended loads, rotating equipment, red zones, and high-pressure systems. ABC specialists use live video feeds to identify unsafe behaviors and escalate interventions before incidents occur. The center is further supported by LEO (Low Earth Orbit) satellite connectivity, ensuring uninterrupted live access to remote offshore rig operations. ARO is also piloting AI-based hazard detection technology to enhance ABC's ability to automatically recognize at-risk situations and improve detection accuracy. In parallel, ARO has implemented a fully digital Permit-to-Work (ePTW) system with configurable workflows and standardized content; digitized its safety observation program to improve structured hazard reporting and analysis; and completed a proof-of-concept for the rig standard operating procedures (RSOP) transformation project, aimed at standardizing and simplifying over 7,000 procedural documents. Safety learnings and alerts are shared using LEO-enabled digital signage, delivering timely safety messaging directly to the point of work.

Results, Observations, Conclusions: ARO's integrated safety approach has delivered measurable improvements across offshore operations. The Total Recordable Incident Rate (TRIR) improved by 63% year-over-year, reflecting the combined impact of real-time behavioral oversight, digital process control, and strong frontline engagement. ABC interventions have helped prevent incidents by identifying unsafe acts during high-risk activities, while the AI hazard detection pilot is already demonstrating potential for improving situational awareness and detection speed. The digital ePTW platform has resolved procedural inconsistencies and improved permit accuracy and traceability. The structured safety observation system is enabling better trend analysis, and LEO-powered digital signage has strengthened workforce awareness by broadcasting lessons learned and reinforcing procedural expectations in real time. As ARO expands its fleet with advanced newbuild rigs, this digital ecosystem supports consistent, simplified, and disciplined operations under increasingly complex conditions.

Novel/Additive Information: This paper offers a scalable model for how offshore drilling contractors can improve safety performance through centralized behavioral monitoring, procedural digitalization, and real-time communication. ARO Drilling's integration of AI pilots and satellite-supported platforms into live operations illustrates how data and technology can transform traditional HSE systems into intelligent, field-responsive safety ecosystems.