

PERDIDO SPAR WINCH CASE STUDY

Samson Synthetic Rope Overcomes Deep Water Challenges

Samson's Quantum-12™ provides an efficient solution for subsea installation and retrieval for one of the deepest production facilities in the world.

When Shell was designing the Perdido Spar platform's subsea asset deployment and retrieval system, it faced a problem: at water depths over 8,000 feet, a traditional wire rope drum winch system would be too heavy for the platform on which it was to rest. A revolutionary new winch/rope system was needed.

Shell chose Samson's Quantum-12 synthetic rope on a Logan Industries traction winch to solve the problem. It marked the first time Shell had used a synthetic rope system on a spar platform and the first time Samson's Quantum-12 had been used in this type of application.

BACKGROUND

The Perdido Spar, operated by Shell on behalf of partners BP and Chevron, is part of the world's deepest oil production facility. It is the most remote producing platform in the Gulf of Mexico, almost 220 miles off the coast of Texas, and the only development in the region to use subsea separation and boosting equipment. The development features 22 wells and 13 more well tie-backs, which must be changed out and serviced at regular intervals.

Rather than deploying offshore service vessels to the remote development at great expense, the Perdido Spar's design includes a winch system allowing the platform to service the subsea equipment itself. However, operating in nearly 9,000 feet of water while handling payloads of up to 90,000 pounds can be a challenge. Compounding the problem, the Perdido Spar design places the winch on a cantilevered deck (a smaller deck extending out from the main platform) imposing significant weight restrictions.

A traditional steel wire rope of this length would be prohibitively heavy. Weighing 81,750 pounds, it would double the necessary lifting capacity of the winch. This would in turn increase the size of the winch and cause significant structural modifications to the spar.

THE SAMSON SOLUTION

To solve the problem, Shell solicited possible solutions from their winch and cordage suppliers. After reviewing several proposals, Shell decided a synthetic winch line offered many advantages and would require minimal deck space. Shell turned to Samson for its expertise in high-strength, lightweight synthetics and to Logan Industries for a simple, yet unique traction-style winch design. This combination met the weight and footprint restrictions of the cantilevered deck and was more than capable of performing the subsea operations.

Samson provided 9,200 feet of 2-1/2" diameter Quantum-12 rope made with Dyneema®. Weighing 85% less than a wire rope of similar size and length, this greatly reduced the deck weight. The biggest advantage, however, is that Quantum-12 is neutrally buoyant and adds no weight to the payload. This allows the winch to work at full capacity regardless of depth. Samson also worked closely with Logan Industries throughout the project, assisting the design engineers in creating a smaller, lighter winch system specific to the characteristics of the Quantum-12 high-performance rope.

Logan traction winch designed for Samson Quantum-12 met weight requirements for the cantilevered deck on Shell's Perdido Spar.

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Quantum-12 provides the same strength as the similarly sized wire rope. It is made with Samson's patented DPX™ fiber technology for superior abrasion and cut resistance with a higher coefficient of friction than other high modulus polyethylene ropes. Synthetics also offer superior bend fatigue properties than steel wire rope at smaller bend ratios. This feature allowed Logan to design the winch system with a smaller diameter traction head, resulting in a significant weight reduction.

Samson technicians perform an annual winch line inspection on the Perdido Spar and after two years of service the rope is in excellent condition with normal wear and tear and no internal abrasion.

"This synthetic winch system enables Shell to save precious time and money in its well completion and maintenance operations," said Dennis Sherman, Samson's Director of Offshore Sales. "Having the winch installed on the spar means Shell avoids hiring costly vessels to manage the deployments around the rig site. This solution would not have been possible with a steel wire system."

Samson master distributor, SWOS, of Houston, Texas, also assisted with installation and fabrication for the project.

THE SAMSON ADVANTAGE

Samson doesn't just sell rope. Samson partners with its customers through the design process, proper installation, crew training, custom documentation, and determination of retirement criteria. With the most advanced R&D engineers, technical sales team, and field service professionals, Shell was assured of having the right product for their highly customized application. It's this all-encompassing relationship that sets Samson apart to deliver the best possible products and services to the offshore industry.

For more information on Samson's complete line of high-performance ropes visit our website, www.SamsonRope.com, or contact our customer service department.



Logan's winch design includes a storage reel with capacity for 9,200 feet of 2-1/2" diameter Quantum-12 high-performance rope. Quantum-12's superior bend fatigue properties allowed a significantly smaller diameter traction head, reducing weight.



After two years of regular service, inspections show the rope to be in excellent condition with no internal abrasion.

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