



Shell Stones Project

Reliable rigging for the world's deepest field through custom design, rigorous testing and superior rope construction.

As the world's deepest production facility, Shell's Stones project presented innumerable challenges for rigging requirements. Focusing 100% on synthetic rope, SWOS provided high-performance rigging solutions through custom design, rigorous testing and superior rope construction. The result is excellent operational performance.

Full-service rigging

Based in Houston, SWOS is a leading supplier of high-performance rigging systems to oil and gas companies operating in the Gulf of Mexico and offshore sectors throughout the world. SWOS mastery includes industry specific rigging applications, including winch lines for subsea installations, node connections for custom seismic streamer lines, customized riser protection nets and engineered lifts for offshore construction. As a full service rigging shop, SWOS has the largest selection of cordage in the U.S. and has gained a reputation for the fastest turnaround times.

Master fabricator and distributor

Since its inception in 1985, SWOS has been a distributor of Samson, the leader in fiber-rope technology. Starting as a Regional Service Center for Samson, SWOS has progressed to become a Master Distributor, as well as one of three Master Fabricators worldwide. Working with Samson's industry leading R&D, engineering and technical services department, SWOS has gained the confidence to provide the best rope products and reliable service.

For the Shell Stones project, SWOS and Samson designed, rigorously tested, and built tapered buoy pickup, winch, buoyancy and messenger lines, and two Vectran riser pull-in lines of 435 m length. The riser pull in line and winch line are shown here.



Custom-designed lightweight solutions

From hemp fiber to nylon and polyester to Aramids and HMPE, new developments in fiber rope technology have evolved synthetic rigging solutions over the past several years. SWOS designs and fabricates rigging solutions utilizing a wide variety of neutrally-buoyant fibers and rope constructions. Custom buoyant rope solutions can be used at most depths without propensity for breakage, because they weigh virtually nothing. SWOS synthetic rigging systems are lightweight, easy to handle, require fewer operators, and occupy less deck space.

Rigorous testing

For customers needing certification to prove the overall strength of their lines, SWOS provides break-strength testing. SWOS in-house testing facilities also perform internal destructive testing on prototypes for synthetic rope suppliers.

Stones project

SBM Offshore first brought in SWOS to supply a tapered buoy pickup line. "This was SBM's first use of a synthetic rope system," explained Mike Poroo, SWOS Project Manager. "Even before we received the contract, we provided SBM with various technical information on rope performance. Working hand-in-hand with SBM engineers, we submitted a design for sheaves, layout and routing while addressing various questions about heave compensation. A buoy pickup line needs to float and have unique density requirements. Together, with Samson, we designed a pickup line that was tapered from 140 mm to 80 mm, resulting in significant size reduction, weight savings and a smaller winch package than possible with a wire rope system."

"The riser pull-in rope required an extremely heavy rope with a specific density target in seawater," explained Poroo. "There were no off-the-shelf rope products available," added Justin Gilmore, Samson Technical Sales Manager. "SWOS and Samson worked together to develop three custom-built options. In order to get the highest density possible, Shell ultimately selected a 12-strand Vectran™ rope with a 12-strand lead core."



SWOS, and its rope testing partner Versabar, designed a full scale test rig to accurately assess the durability of the custom riser pull-in line as it bends through sheaves during the evolution.



Samson: Leader in high-performance ropes

For over 130 years, Samson has been recognized as a worldwide leader in the development and manufacture of high performance ropes. Among its many innovations, Samson invented the double braid and pioneered the first high-modulus polyethylene fiber ropes. Today, Samson engineers continue to pioneer the use of new fiber technology and the development of innovative coatings and constructions to produce ropes with unprecedented performance characteristics. Samson's research and development team is meeting an ever-expanding market need for products with exceptional performance in critical applications.

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We have used lead in ropes before to add weight, but had never put this much lead in a rope." After successful MBS (minimum breaking strength) test regimen on the prototype rope, SWOS, and its testing partner Versabar, built a full-scale test frame to test the rope's reaction to bending over the sheaves and routing in the course of a number of different cycles. The tests stressed the rope to the maximum estimated dynamic load of a flooded riser. "The customer support continued offshore with a SWOS technician on board during the first riser pull-in," said Poroo.

Project success

"The takeaway from the project was that we took the client's problem, applied our knowledge and expertise to develop a successful solution when no off-the-shelf option was available," said Poroo. "We appreciate the confidence our clients entrusted in us to develop an optimal solution."

"We expect the synthetic rope systems to yield significant advantages over wire-rope systems throughout the life of the project, including long operational life, absence of corrosion, and protection of riser tube coatings," added Gilmore.