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Feature Story – Page 10



# The “Wright” Approach to Deploying a Riser from a Vessel of Opportunity

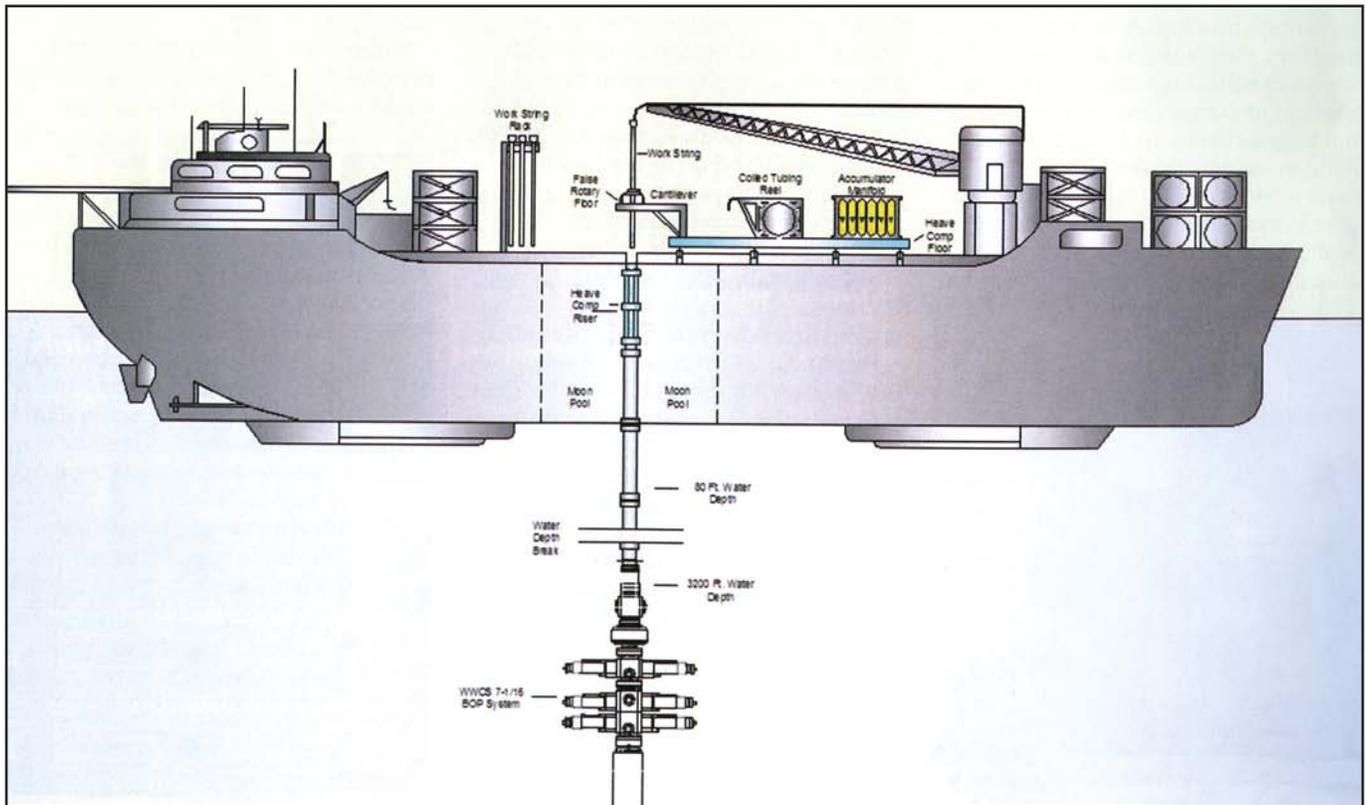
By Wright’s Well Control Services

*Offshore technology inventor and Wright’s Well Control Services president, David Wright, asks the question “Why does rigless also have to be riserless?” His answer: a heave-compensated system that stabilizes itself via a nitrogen-filled, dual-cylinder assembly. This self-contained kit, along with a heave-compensated vessel floor, could soon enable using risers for running coiled tubing or wireline from a vessel of opportunity.*

“Our team is experienced in rigless and riserless interventions, including acid injection and stimulation, P&As, decommissioning, and hydrate remediation. As a result, we are familiar with running rigless equipment, subsea packages, coiled tubing, and deepwater tools overboard from a vessel, and we have learned valuable lessons in running operations through an MSV’s moon-pool,” says Wright. “However, as I looked to expand the services that are currently offered from a boat, I questioned the age-old subsea intervention paradigm that rigless and riserless have to be wedded concepts. Why were we limiting ourselves simply be-

cause that’s the way it had always been done it in the past? Why couldn’t we have the stability and performance offered by a rig while running a riser?”

The answer came to Wright in the form of a new heave-compensation system. He envisioned running coiled tubing, wireline, or other equipment while two cylinders worked in unison against heave from the surface and subsea. He designed it on his computer, sent it to Parker that day to double check the engineering, and it is now in production with a few operators considering utilizing the system for its first deployment.



Wright’s Well Control Services heave-compensated riser connected to a WWCS 7-1/16in. BOP

The WWCS Heave-Comp System further breaks with convention by offering a central longitudinal conduit extending through the center of its cylinders. Where other rig-based kits externally stabilize a riser, the WWCS device is machined from its midpoint with a 6in. ID pathway to allow tools to run through the center of the mechanism. “We offer a higher degree of riser management from a vessel during bad weather scenarios, allowing for continued abandonments, workovers, completions, and production operations,” says Wright.

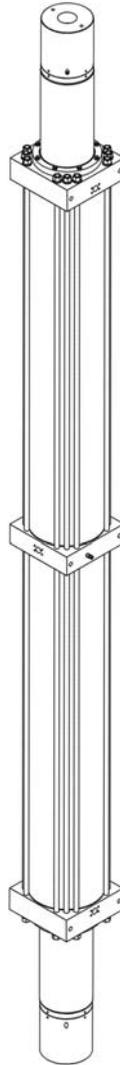
The heave comp is designed for a 150,000lb tension load and has 20ft of total stroke. “Once you throw your bowls and slips in a false rotary floor, set the tension, rig up on top of it, and attach the riser to a BOP, we can run coiled tubing through the moon-pool or off the stern of a vessel via a secondary cantilever in 10,000ft WD or deeper depending on riser weight,” says Wright. “When that coiled tubing is only moving 3in. to 4in. you have all the benefits of both a riser and a rig.”

The system has two cylinders that are aligned internally, share a common central head or base plate, and are housed in the same exoskeleton. “After looking at a number of options, a fluid solution made up mostly of nitrogen gas became the medium of choice for pressurizing the heave comp’s cylinders,” says Wright.

These nitrogen-filled cylinders are in fluid communication, working in tandem to exert force against each other. While the lower cylinder absorbs the force of the surge subsea on the riser, the upper cylinder compensates for the wave motion experienced by the deployed vessel. The opposite ends of these cylinders – the top of the upper cylinder and bottom of the lower cylinder – travel through the central cavity and move up and down against a common base plate.

Wright is also applying his new stabilization design directly to the vessel itself. Nitrogen-filled cylinders, similar to those used to heave comp the riser can be applied to a heave-compensated floor attached to the vessel deck. “When the heave-comp riser is coupled with the heave-comp vessel floor, you are offering additional means to achieve rig-based performance, but is not my intention to replace rigs for P&As and subsea interventions,” says Wright. “We are just building on the principle of a rig’s ability to stabilize equipment, either when running through a riser or when stabilizing the floor on which that equipment sits.”

The WWCS system is engineered with a 2:1 safety ratio where the tolerances for the riser and floor are adjustable to a predetermined pressure by manipulating the amount of nitrogen in the cylinders. Depending on multiple factors, expected load, motion, type of ship, the weight of the riser, water depth, season, and changing weather conditions, the cylinders are pressured for optimal performance. The cylinders extend or retract to provide the desired length for the field conditions encountered. “The heave-comp riser can also serve as a redundant system for a rig, providing an additional layer of safety,” says Wright.



*Cylinder assembly for WWCS Heave-Compensation System*

“Nitrogen enhances the safety of the heave-comp system. It is environmentally friendly, is less likely to leak, and through a series of relief valves can provide a fluid response to force within milliseconds,” says Wright. Between 40 and 80 gallon bottles of nitrogen can be pre-charged and do not need to be placed directly next to the cylinders for effective pressurization. He also notes safety is further reinforced with a hybrid emergency quick disconnects (HEQD), which allow for the system to eject from the riser for contingent or unplanned operations.

### Wright’s Rigless R&D

Wright has used his rigless ideas for equipment to get work ever since he founded the company. “The ability to think of ways to work off a boat has set us apart and with the cost savings our equipment brings to the table has helped us to win jobs,” says Wright.

“However, we are much more than some offshore think tank,” says Wright, noting that after he has the idea for a new piece of kit, he and his colleagues are tasked with building it and successfully deploying it. “We learn lessons from each new invention’s operational success that help turn around the development and execution of the next idea that much faster.” For example, Wright took his experience working with EQDs to design those used on the WWCS Hydrate Remediation System. He will now reconfigure the same EQDs and make some improvements for the heave-comp system. “Just think of the R&D time and cost we saved by carrying over that one piece of equipment from one idea to the next.”

WWCS rigless repertoire includes the Wright’s Intervention Subsea Equipment (WISE) BOP system that allows the opening of the well bore for plug & abandonments and interventions. Wright is also credited with conducting the Gulf of Mexico’s deepest rigless wireline intervention from a MSV in 3,500ft WD, increasing gas production by 800% and oil production by 300%. For this job, the company used its own proprietary class 1, division 2 explosion-proof wireline units. These Wright designed units have interchangeable wire-drum sizes allowing for switching between .108in., 7/32in., 9/32in., 3/16in., and 5/16in. wires in 45min by pulling four pins. Another Wright accomplishment was the Gulf’s first ever acid job on a subsea well from a DSV in 450ft WD.

“It gives me great satisfaction in taking a new idea from inception, design, fabrication, and testing to its inaugural deployment. Watching a new kit hit the splash zone for the first time and knowing all the creativity and hard work that went into getting there is one of the things that still makes me tick,” says Wright. With a delivery date later this year, Wright is optimistic about how this technology is taking shape. “The other fun part is seeing what new twist we will learn from this system’s deployment, giving us a leg up on the design and build of the next invention after that.”

For more information, visit [wwcs911.com](http://wwcs911.com).

# INTRODUCING THE WRIGHT APPROACH TO RIGLESS PLUG & ABANDONMENT

Wright's Well Control Services' subsea BOP system includes a lower package and lubricator with pressure control assembly to perform rigless plug and abandonments on vertical and horizontal trees. The system enables the running of wireline during P&As with the use of a highly effective grease head that creates a seal around the E-line or slickline during the open bore phase of BOP operations. With a small foot print—the complete 3" kit can fit on the back of a MSV with room to spare—the Wright approach is the cost effective choice for abandonments and also thru-tubing completions.

To learn more about  
Wright's Well Control Services'  
Rigless Plug & Abandonment and  
Well Intervention Solutions  
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or visit [www.wwcs911.com](http://www.wwcs911.com)

