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Record 42-Inch Bore Helps Connect LNG Terminal, Pipelines

Shared Risk, Cooperation Make Complicated Project Possible

When Sempra Energy's Pipelines and Storage business unit needed to install a new pipeline from Sempra LNG's new Cameron LNG receipt terminal to existing interstate pipelines north of the LNG facility, they were well aware that the project presented special challenges.

Connecting the \$850 million LNG terminal taking shape on a 275-acre industrial-zoned site along the Calcasieu River near Lake Charles, LA, to a major pipeline junction capable of accessing 65 percent of U.S. gas markets, required 36 miles of 42-inch pipeline. Cameron LNG is slated to commence commercial operation later this year.

The construction of the pipeline was awarded to the pipeline division of the Norman, OK-based Henkels & McCoy Inc. As the general contractor for this project, Henkels & McCoy selected Laney Directional Drilling (LDD), Houston, to perform all of the horizontal directional drills on the project.

The pipeline required the installation of 16 horizontal directional drills ranging in length from 1,300 feet to 5,000 feet. Of these drills, a 2,000-foot crossing of the Salt Ditch Canal and the 5,000-foot crossing of the Intracoastal Waterway were expected to be particularly challenging.

The original plan called for both the Salt Ditch Canal and the Intracoastal Waterway crossings to be staged from an island accessible only by boat or barge. In order to accommodate the Laney HDD rig and support equipment, the entire drill site had to be constructed with materials and equipment that was barged up the Intracoastal Waterway to the drill site location. Plans called for the crew to set up the drill rig and work on the island site, where they would first drill the Salt Ditch crossing and then turn the rig around and drill the Intracoastal Waterway crossing.

Initial concerns

Hernan Machicado, project manager for Sempra Pipelines & Storage, expressed concerns

about the costs and logistics of the two drilling projects. In an effort to reduce costs associated with the transportation of matting, equipment and employees, plus the expenses involved in piping fresh water and waste drilling fluid, Machicado explored the possibility of installing the pipeline with a single drill that would extend approximately 6,700 feet.

Grady Bell, project engineer for Laney Directional Drilling, said his company had completed a previous drill totaling 5,200 feet of 42-inch diameter pipe for an LNG project about 70 miles south of Houston. A 6,100-foot drill had been completed near Orange, TX, and had set the latest in a series of HDD records. "No one had ever attempted a drill of 6,700 feet of 42-inch pipe," he observed.

From the onset, it was clear that everyone involved in the potentially record-setting drill – Sempra Pipelines & Construction, LDD

and Henkels & McCoy – would take on some shared risk and that a comprehensive risk analysis would be required. After his analysis, Paul Greenwell, LDD's project manager, concluded that while the length of the drill was significant and the risks were reasonably high, the drill could be installed if all the risks could be identified and mitigated.

In addition, the need for large amounts of fresh water for the drilling process posed overwhelming challenges in this highly environmentally-sensitive area. Although several avenues were explored to solve the water issue, the solution involved piping water approximately two miles from the Sempra LNG terminal to the drill site where it was stored in frac tanks.

Another significant challenge involved pulling the 3.5 million-pound pipe into the underground bore hole.



The staging area for the record bore.