



Pipelines Reconstructed In Iraq Project

Some 15 Iraq pipelines operated by the North Oil Company (NOC) cross the Tigris River south of Kirkuk and east of Baiji in the heart of the Sunni triangle. This pipeline corridor is in the vicinity of a railroad and auto bridge, both of which were partially destroyed by the Multi-National Force-Iraq (MNF-I) during the Iraq war, resulting in damage to several pipelines in that vicinity. The war has resulted in a substantial U.S. funded reconstruction of Iraq, most recently implemented by the Project Contracting Office (PCO) and administered by the U.S. Army Corps of Engineers.

In 2005, the PCO awarded an "indefinite delivery" contract to Parsons Iraq Joint Venture (PIJV) primarily for reconstruction efforts in the northern part of Iraq. A number of these projects have focused on NOC facilities as well as product pipelines operated by other governmental entities. PIJV awarded a fixed price contract to A&L Underground Inc. for reconstruction of all 15 of the pipelines in a corridor at a location called Al Fatah, south of Kirkuk. The pipelines range from eight to 40 inches in diameter and include a 30- and 32-inch diameter line carrying products, including gas, oil and propane. All of the pipelines cross the fast-moving Tigris River.

Due to extreme gravel and cobble present at the location, PCO elected to install the pipelines using the conventional cut-and-cover method. As an initial step, all of the

pipe for the project was concrete coated on the east bank of the river with technical supervision provided by Allan Edwards Corporation of Tulsa, OK.

Most significant of the installations was a 40-inch diameter crude oil pipeline, which was a .688, X-52 pipe with a six-inch concrete coating that resulted in a pull section weighing in excess of 1.3 million pounds. After coating, the section was placed on rollers to facilitate the pull with a 500,000-pound winch spooled with two-inch cable and placed on the west bank of the river.

Randy Duncan, project manager for A&L's work at Al Fatah, elected to excavate the river crossing using sectional or flexi-float barges and a Mitsubishi long-reach excavator. The excavator had 65 feet of reach and was used in nearly 20 feet of water that was moving at 1.5 meters per second. Spuds were used for added stability during excavation.

Duncan said, "The 1.5 meters per second velocity of the river complicated the installation. It also required extreme caution and precise positioning of the barge. The crossing went well and included over 100 feet of solid rock which had to be hoe rammed before excavation. Once we had the ditch prepared, it took only seven days to install the nine open-cut pipe sections." A&L also tied in six additional pipelines that had previously been installed by directional drills.

Security & Logistical Challenges

"Security and logistics proved to be the biggest issue on the job," said A&L's QA/QC Manager Kenny Green. "We had to purchase and mobilize all the equipment from the Middle East due to an expedited construction schedule necessitated by an anticipated high-water flow in the river during the month of December. Logistically, the project was a nightmare because there was no easy access to material or equipment and moving things around in Iraq is a real problem," he said.

Also, because A&L employees were housed in a camp located on site, security issues proved the most significant obstacle on the project. Over the course of the job, crews encountered numerous terrorist attacks before an improvised explosive device (IED) was used to blow up an oil pipeline on the east bank, temporarily shutting down the project's east river bank construction front.

Gen. George Casey, the MNF-I Chief of Iraq Operations, visited the site to review the security situation in light of the critical nature of the project to Iraq's oil export plan. He ultimately decided to dispatch the 101st Airborne to the site to supply the security necessary for A&L to work safely on the site. "After the 101st showed up, virtually all of the security issues went away," said Duncan.



Iraq Project

ber 2005 which resulted in additional delays.

PIJV and the Corps of Engineers had encouraged A&L to use as much local Iraqi labor as possible to enhance the local economy and improve craft labor skills related to pipeline construction. A number of the welders and operators on

the project were Iraqi and a local concrete subcontractor provided civil support for the concrete-coating effort as well as two large concrete manifold vaults.

"We found the local Iraqi community very positive toward us and also toward the U.S. military effort," Duncan said. "To our surprise, we also found a substantial group of skilled laborers in the area."

"Once excavated, the river was over 1,200 feet wide and with the significant water flow, it posed a formidable installation risk," Duncan said. "I have never installed this many lines in a single river crossing let alone in a war zone, so under the cir-

cumstances I was very proud of how things came together."

Duncan said that as it turned out, the substantial amount of gravel worked in the crew's favor. "Despite the river velocity, crews experienced very little siltation in the ditch during the installation. Because of the flexi-floats and long-reach excavator, the backfill work also went well and we were able to just beat the bad weather," he explained.

A&L subcontracted the engineering to Universal Ensco's Project Engineer Luke Duncan who provided preliminary survey and final alignment drawings for the project. Numerous field changes in routing were required to avoid the numerous existing pipelines and other design changes were required to facilitate immediate repair of pipelines damaged and destroyed by insurgents during construction. The site survey work was done in-house by A&L.

FOR MORE INFORMATION:

Pipeline contractor:

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Coalition forces began giving Al Fatah more attention by having a greater military presence in the immediate area. "Through helicopter surveillance and regular troop visits to the surrounding area, security issues disappeared," he said.

An IED attack on an oil pipeline within the project limits resulted in a substantial slowdown in the work as the oil pipeline ignited two gas lines in the vicinity and resulted in a fire that burned for nearly a week. Two other major IED attacks against the site resulted in additional delays, with no loss of life. Numerous mortar and rocket attacks occurred between June and Decem-