FASTRAK™
The Best Boring News from DCI® DIGITAL CONTROL INCORPORATED® Vol. 4, No. 1 - February 2000

Difficult Sewer Line Installation at German RR Station

If one picture is worth a thousand words, then this photo speaks volumes about the above-ground interference potential at this site in Cologne, Germany. Railroad tracks and switching stations are among the worst environments for locating a directional drilling tool/transmitter. The abundance of metal in the tracks and trains, coupled with the power and signal lines, can pose significant locating problems. This is especially true in Europe, where most trains are electrically powered from overhead high-voltage lines.

The Cologne Deutzerfeld railway station sought a means to install a forced sewer line under 37 sets of tracks in their switching yard—without disrupting the high volume of train traffic. After some consideration, it was determined that a trenchless installation was the only solution for the busy rail yard. The German construction company LTG won the project to install this sewer line for Deutsche Bahn (DB), the railroad company.

Prior to drilling, the site was investigated to confirm the positions of underground utilities. The findings indicated several 100-kV power lines, control cables for track adjustments, and fiber-optic cables at depths between 0.8 m (31 in.) and 1.8 m (71 in.). The combined signal from both the above- and below-ground cables understandably caused concerns about accurately locating the drilling tool.

DigiTrak operator verifying borepath.

To add to the complexity of the job, ground conditions were highly variable due to the historic nature of the site. During World War II, the rail yard was heavily bombed, which left large craters that were backfilled with boulders and miscellaneous debris. In addition, unexploded ordnance was thought to be present, requiring an ammunition disposal team's presence during the project.

Because of the significant amount of interference from both the above- and below-ground cables, a transmitter with a strong signal was required to compete with the electrical noise conditions. The standard DigiTrak battery-operated transmitter was ruled out based on its lower signal output. Instead, DCI's cable transmitter was selected. The cable transmitter's increased signal strength and its ability to send uninterrupted pitch and roll up the wire would enable LTG to accurately track the tool's position under all 37 sets of tracks.

The drill chosen for this scope of work was Tracto-Technik's 10-ton Grundodrill 10S. This rig has an “uphole” hydraulic percussion hammer that was particularly helpful in the gravelly sections.

Once all of the DB's site requirements were satisfied, LTG began drilling on the morning of July 7, 1999. The tool's entry location was a shallow gravel bed adjacent to the tracks, as seen in the photo. The percussion hammer was used successfully for most of the bore. At a depth of 2 m

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LTG setting up Tracto-Technik Grundodrill rig at edge of tracks

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(6.6 ft), the bore path was leveled off and the depth was held constant for 70 m (230 ft) (halfway into the bore) where the tool entered a temporary "control pit." This pit was used to confirm to the railroad that the drill tool was on line and grade. During the excavation of this pit an unknown water main directly in line with the intended borepath was discovered, as was an old building foundation. These two finds resulted in the latter half of the bore being redirected down to 3 m (9.8 ft) instead of 2 m (6.6 ft). The pitch readings never faltered at the remote display, allowing the rig operator to maintain the bore's desired grade. The DigiTrak receiver tracked the front and rear locate points to maintain the bore's desired heading.

Because the tool entered the control pit on schedule, as well as on line and grade, everyone was satisfied that a quality job was in progress. The DB requested permanent documentation of the installation, so the entire bore was logged using DCI's DataLog System. This provided both LTG and the rail company with permanent drilling information about the installation in both graphic and data formats.

Later that day, the pilot hole was completed with the tool exiting precisely at the target exit location. The following day the hole was pre-reamed using a 180-mm reamer while trailing rods. The product, 140-m (460-ft) x 110-mm (4.3-in.) HDPE pipe, was pulled in on the 9th of July with a pullback time of 2 hours. After a successful pressure test, the installation was accepted by the DB.

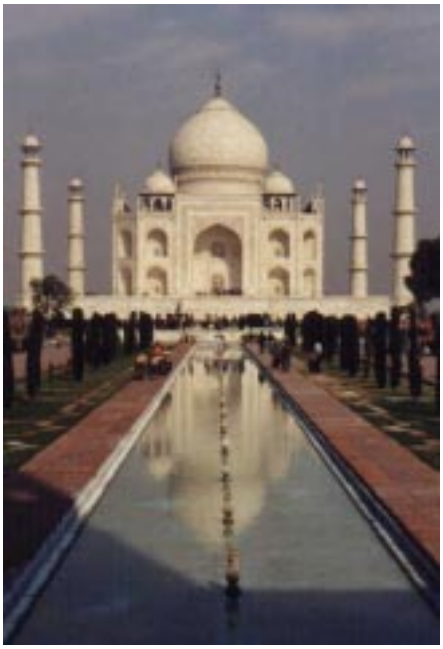
Given the success of this project, the DB's faith in the performance of the HDD method was clearly strengthened. By working closely with the contractor and observing the operation of the equipment, they also came to see the importance of choosing the proper tools. Although this particular crossing was neither very long nor deep, the safety issues posed by the unexploded ordnance and the high volume of train traffic made the project difficult in its own right. Especially noteworthy was LTG's overall project planning and decision to use the DigiTrak cable system to combat the considerable interference potential.

HDD Taking Off in India

DCI recently attended the 2nd Annual No-Dig 2000 Exhibition in New Delhi, India. Though India has a long way to go on improving and building their infrastructure, the country is receptive to using modern means adopted by the Western World.

The Indian Society for Trenchless Technology (INDSTT) was instrumental in putting the exhibition together. Credit is especially due to the chairman of the INDSTT, A. K. Sarkar, and the secretary, B. S. Sastry, who are working hard to gain the acceptance of trenchless methods in India.

Dealers and manufacturers such as Vermeer India are also playing an integral part in introducing horizontal directional drilling and other trenchless methods into the country. The Vermeer dealer, headed by Navneet Mathur, is leading the way in providing directional drills in the country, with 14 Navigators in place. There are also several Tracto-Technik and American Augers drills in the country. The locating equipment used with the majority of these machines is DCI's DigiTrak system. DCI made two presentations at the conference—one



TECHNICAL TIPS - Remote Telemetry Problems

One of the most frequently asked questions posed to our Customer Service Team is: Why does my remote display unit (at the drill rig) have dashes across all the windows?

A common misconception is that the remote unit is malfunctioning, which is not necessarily the case. The DigiTrak receiver gets information from the transmitter in the ground and then instantaneously forwards this information to the remote display. If this communication link is broken, the rig operator will see dashes across all the remote display windows. More often than not, it is the DigiTrak receiver and not the remote unit that is causing the problem.

If dashes appear across the windows on the remote display, you should first verify that the receiver and the remote are set to the same channel. The remote display has a channel selector button that makes the channel setting clearly visible. The DigiTrak Mark III Receiver, however, only shows its channel setting during start-up. After all display windows light up with 888's (display test), the next number displayed in the bottom window is the channel setting, and it will only display for 2 seconds. During this 2-second interval, the channel can be changed by clicking the trigger until the desired channel is displayed. A zero (0) channel setting indicates that the telemetry is turned off, and the receiver will not send signals back to the remote display (good for conserving battery).

NOTE: *It is always important to watch the display windows during start-up to ensure the settings are correct and the unit is functioning properly.*

HDD Taking Off in India (cont.)

was an overview of horizontal directional drilling, and the other was on the history of walkover locating.

The highlight of the show was a visit by the Minister of the State of Delhi, who makes his home in New Delhi. The INDSTT is striving to convince the government of the individual states to ban open cut methods and to accept only trenchless methods. A major problem facing both contractors and dealers is the high import tax placed on the machines and spare parts that are brought into the country. Mr. Singh from Mideast Pipeline, a local contractor, addressed these issues at the conference.

With strong local dealer support along with training and support from foreign manufacturers, India looks to become one of the region's leaders in trenchless technology.

DCI's Joe Zeck extends greetings to the Minister of the State of Delhi.

Chris Weise of DCI demonstrates the DigiTrak Locating System to conference attendees.

A snake charmer performs his art outside the ancient city of Agra. Sights like this and the Taj Mahal, shown on page 2, amaze tourists at every turn.

UCT 2000 Conference Held in Houston

DCI participated in the 6th Annual Underground Construction Technology International Conference & Exposition (UCT 2000) held in Houston, Texas, in January. The attendance was up 14 percent from last year, making it a record breaker.

DCI's specially designed locating platform permitted attendees to track transmitters beneath it using our new locating equipment. We currently have three new systems in the final stages of development: the DigiTrak Mark IV, the DigiTrak Eclipse iGPS, and the DigiTrak LT.

The locating platform was the only one of its kind at the show, and it afforded many folks with hands-on locating time. This fueled many questions from contractors and dealers alike on their current DigiTrak equipment and also gave them a glimpse of the future with the next generation of DCI's locating equipment.

DCI's Mark Gallucci and Joe Russell (from Vermeer Olathe, Kansas) discuss equipment upgrade options at UCT 2000.

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