FASTRAK™
The Best Boring News from DCI
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Los Angeles Amtrak Roundhouse Switching Station

DCI was contacted last spring by Frank Zitkovic, Operations Manager of Premeci Inc., who was at the LA Amtrak station. He was having problems with his DigiTrak™ system, in particular with the depth and direction readings. The site conditions he described were dismal.

The project involved installing slotted PVC pipe for oil remediation from service pits used for locomotive maintenance. There was more steel present at the site than on any other project DCI had witnessed. This included a large number of railroad tracks, the heavily reinforced service pits, diesel and hydraulic fluid steel tanks, and, just for good measure, five locomotives parked along the bore path. There were also high-power lines overhead as well as in-ground power.

Due to the hydraulic tanks, the bore path required a depth of about 70 ft (21 m). The scope of work required three runs, about 1000 ft (305 m) in length each. To complete the job, Premeci had elected to use a CMS 65,000-lb (29,500-kg) machine with the DigiTrak Cable Transmitter™ system. This system sends the pitch and roll information back to the drill operator via a cable, while depth, left/right steering, and directional signals are received overhead

Setting up the bore at the start of the run.

in the same way as the standard DigiTrak system. The Cable Transmitter has a depth range of approximately 140 ft (43 m), assuming no background interference and using a Mark III receiver. It provides uninterrupted pitch and roll information in the presence of magnetic and electrical interference.

Chris Weise, DCI Field Service Manager, had been working with San Diego Gas & Electric just a few hours south, so he made arrangements to visit the LA site. When he arrived, the crew had successfully located up to the first set of tracks. Just beyond this point, however, the depth signal became very erratic due to all the interference. As a result, the directional signal (the forward locate point) was imperceptible. The crew had been fighting this bore for a number of days, never getting any further than to the first set of tracks. *(continued on page 2)*

The Los Angeles Amtrak roundhouse switching station proved to be a very difficult site for underground locating.

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Chris' suggestion was to use the DigiTrak remote steering function. This enabled the crew to circumvent some of the interference factors by placing the receiver as far out in front of the drill head as the transmitter signal would allow. Using remote steering, the operator could then determine the direction of the bore. Since the depth information could not be relied on, depth was calculated based on keeping track of the pitch rod by rod.

Chris Weise locating in a service pit near the end of the run.

The remote steering function was used again to cross the most difficult part of the run—under the service pit and around the locomotives. The DigiTrak receiver was placed on a ladder to separate the receiver as much as possible from the below-ground interference. The pitch readings were then used to verify and calculate the depth, and the remote steering was used for left or right steering commands.

Once the problem area had been crossed, the contractor was able to finish the run the following day using the standard DigiTrak walkover locating methods.

By combining the extra range and reliable pitch and roll information of the DigiTrak cable system with the remote steering function, an extremely difficult—and nearly impossible—run was able to be successfully completed.

by Siggi Finnsson & Chris Weise

Placing DigiTrak receiver on ladder to minimize below-ground interference.

DigiKnow . . .

DCI has recently introduced the TransiTrak™ iGPS™ system, which will be available later this year. This system represents a major advancement in directional drilling tracking systems. It eliminates the need for a locator crew member. The drill rig operator is presented with all the information necessary to control the steering and navigation of the drill.

The TransiTrak iGPS system operates like the Global Positioning System (GPS): turn it on and it tells you where the transmitter is in terms of an absolute position on the surface and an absolute elevation. It tracks the transmitter and displays where it has been, and it shows the drill operator exactly how to steer to follow the desired drill path. TransiTrak guidance is fully automatic, which means there is no locating or tracking done over the drilling tool.

Operation of the system is simple. First, you set up two or more antenna cells spaced up to 200 ft (60 m) apart. You can place these cells where it's convenient, either along the intended drill path or on either side of it. You can set up as many cells as you like or you can work with just two and move them as needed.

TRANSITRAK™ iGPS™
PATENT PENDING
inGround Positioning System

Second, you set up the computer base station at the drill rig. You input the intended drill path by either walking over the path with a transmitting device or by supplying data referenced to points such as survey marks, geographical information system data, or GPS data. Various obstacles, such as utilities, streets, waterways, buildings, and any other items that you need to consider while drilling, can be specified for display on the base station.

Third, you insert the transmitter into the drill head and start drilling. The TransiTrak system tracks the transmitter and displays where the drill head is located relative to the intended path and underground obstacles previously identified. The base station displays a steering indicator that shows exactly how to steer the tool to keep it on course or bring it back onto the intended path in the minimum distance without overstressing the drill pipe or the installed product.

This revolutionary next-generation tracking system will fundamentally change the way drilling crews operate and improve the efficiency of the drilling operation.

TECHNICAL TIPS - *Interference: A Locator's Nightmare*

Have you ever driven down the road next to a semi and heard the truck driver talking on his CB radio through your radio's speakers? Perhaps you remember driving past a radio transmission tower and having that tower's signal being piped into your speakers even though your dial was not set on that channel? Or have you ever driven across a metal bridge and had your radio signal get distorted so that all you heard was static?

These are common examples of *signal interference*. Because transmitters emit a radio frequency, signal interference is always a potential problem.

The CB radio and the transmission tower are examples of *active interference*. Anything electrical emits a signal. When that signal is near the frequency where the DigiTrak receiver operates (33 kHz), the receiver can pick up that signal. Although the DigiTrak receiver does a remarkable job of filtering out errant signals, there are times when unwanted signals can be overwhelming. Other examples of active interference are overhead power or transmission lines, traffic signal loops, microwave towers, cathodic protection, and fiber trace lines.

A steel bridge is an example of *passive interference.* This interference is not a source of signal but rather a blocker of signal. The metal in the bridge distorts and weakens the signal reaching your vehicle's radio receiver. A similar example is when we try to locate a drill head while it is directly under metal, i.e., rebar, metal pipe, metal plate, etc.

We can lessen if not remove the effects of both *active* and *passive interference* by getting the DigiTrak receiver away from the source of the interference. The ultrasonic feature allows you to move the receiver as much as 90 in. (2.25 m) off the ground and away from the interference source. Or you can use the off track guidance technique to track a transmitter far off to the side.

To identify potential areas of active interference that might affect your depth information, walk your drill path and check the background noise levels by observing the signal strength picked up by the DigiTrak receiver. Your transmitter must be turned off. Background noise levels above 200 are considered to be red flag areas and should be identified as such before the drill begins.

To identify areas that might affect your pitch and roll (P/R) signal, walk along the drill path with the receiver while another person is carrying the transmitter and walking parallel to the drill path. The transmitter needs to be turned on and carried at a distance about 1.5 times the intended drill depth. Red flag areas will be those where the P/R update is infrequent or missing entirely.

The goal is to identify any red flag areas before drilling so that you can minimize potential interference problems.

by Mark Gallucci

Tracking and recording bore path data using DigiTrak system with GPS receiver (in backpack) and hand-held GPS recording device.

HDD Goes into Orbit for Next-Generation Locating

The horizontal directional drilling (HDD) industry is changing in many ways. One of these changes is a required bid item for drawings or as-builts of your installations. Weber, a Canadian company based in Clifford, Ontario, has taken the leading edge approach to creating accurate and professional-quality as-builts. They integrated real-time kinematic Global Positioning System (GPS) equipment, a DCI DataLog™ logging system (used with their DigiTrak receiver), and an AutoCAD® compatible computer program.

With this integrated system, an operator can track and record bore path information using the DigiTrak system with a GPS receiver and a GPS data recording device.

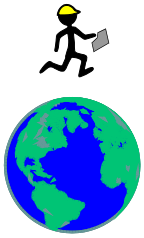
If a customer requests, Weber can locate and plot existing utilities as well as the ones they install. These records can be used by numerous agencies contracted in the future for the repair/modification of existing structures or the installation of new ones. Particularly important, these drawings can minimize potential damage to existing structures. They allow field personnel to confidently determine the locations of below-ground structures and therefore avoid them.

by Eileen Breum

In-House Customer Service Reps

Back row, left to right—Chris Weise, Jennifer Hiatt, Frank Maida, Kris Swanberg, Siggi Finnsson. Front row—Maddi "Tracker" Gallucci, Mark Gallucci, Eileen Breum.

DCI has a total of 13 customer service personnel who travel the globe to troubleshoot and train folks on DCI equipment. Pictured at our headquarters in Renton, Washington (a lovely suburb of Seattle!) is DCI's in-house customer service crew. Chris' territory encompasses Asia, Australia, and South America; Jennifer handles sales and media relations; Frank covers the Great Lakes area; Kris is responsible for the administration of repairs and upgrades; Siggi oversees Europe; Mark has the West Coast; and Eileen covers Canada. Watch for the next *FasTrak* where we will feature the customer service field reps!



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