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Innovation overcomes installation and ageing problems

Clock Spring's casing spacers serve an important role in preserving pipeline integrity, offering certain advantages over traditional casing spacers.

A critical component of installing a cased carrier pipe is the casing spacer. Casing spacers are installed on the carrier pipe to prevent contact between the carrier pipe and casing, thus protecting the integrity of the cased pipe.

Pipeline owners and operators routinely deal with cased carrier pipe challenges, including:

- » Ensuring effective protection of pipelines as they are being constructed, installed or replaced under road and railroad crossings as well as rivers and other water bodies
- » Effectively dealing with the deteriorating condition of casing spacers due to the inherent problems that traditional casing spacers develop over time. A leading technical pipeline institute estimated that of the one million cased crossings in the US, approximately 40 per cent may have degraded to the point of metallic contact

between the pipe and the casing.

In theory, installing a carrier pipe within a casing allows for simple removal of the carrier pipe, should it ever require replacement and protection from geotechnical disturbances. If a leak were to occur in the carrier pipe, the casing should act as a storage vessel, limiting potential environmental effects. In addition, the external casing is often used as a method of protecting against third party interference and damage to the pipeline.

Clock Spring's Vice President, Product Management and Technical Services Buddy Powers says the company has created a spacer that overcomes major issues caused by casing spacers. "The two commonly used casing spacers are the bolt on variety, which uses various material such as plastic or steel, and banded wood skids," he says.

"While the theory behind using casing spacers on a carrier pipe is sound, in reality, these types

of traditional casing spacers can create major issues."

THE PITFALLS OF TRADITIONAL CASING SPACERS

When bolted fasteners on traditional casing spacers break, it results in unequally spaced, or torqued, spacers. If a conductive material is used in the manufacture of the casing spacer and it comes in contact with both the casing and the carrier pipe without any insulation material being present, the potential exists for it to cause a disturbance within the applied cathodic protection.

During the installation process or once installed, should a casing spacer break or become dislodged, the effect can be excessive deflection within the carrier pipe. This can cause the two pipes to come into contact which, in theory, can also lead to problems with the cathodic protection.

Casing spacers that are not sufficiently secured to, or become dislodged from the carrier pipe, can result in the casing spacers congregating or bunching mid-span. This leaves the carrier pipe susceptible not only to coming into contact with the casing, but also to abrasion and coating damage when pulled.

CLOCK SPRING'S COMPOSITE PIPELINE REINFORCEMENT SYSTEM

The Clock Spring composite pipeline reinforcement system is a proven, permanent repair for metal loss defects. The company has developed derivative products for multiple applications over its nearly 25-year commercial history, including Clock Spring's Casing Spacers.

"The Clock Spring Casing Spacer offers advantages over traditional casing spacers. The product is an extremely robust solution that can eliminate integrity issues, which can occur when pipes are pulled through casings," Mr Powers says. "Applied directly onto the factory installed FBE coating, the casing spacer acts to protect coatings, centralise the pipe, reduce pulling friction, and keep the pipe off the casing and remain firmly bonded in place when installed."

Clock Spring's Casing Spacer comprises:

- » A unidirectional fiberglass sleeve sized for the specific pipe diameter
- » If needed, a high-strength, high-modulus



A: Workers installing the Clock Spring spacer system.

B: The Clock Spring composite pipeline reinforcement system in place.

filler used to transfer load from the pipe to the sleeve

- » A methyl methacrylate-based adhesive, which has high lap shear strength, to keep the casing spacer secure.

According to Mr Powers, a Clock Spring Casing Spacer can be field installed and cured in

two hours. Any abrasion during the pipe pull occurs at the outer layer of the sleeve instead of the coating of the carrier pipe. "Clock Spring Casing Spacers provide an easy to install, robust, proven solution," Mr Powers says.

For more information visit www.clockspring.com

Product case studies

Highway crossing near Atmore, Alabama

Pipe and defect details: 8-inch pipeline, X-52, double fusion bonded epoxy coating, operating pressure 975 psi. The pipe had a defect from original pull where spacers failed to stay in place. Replacing defective pipeline with new pipeline.

Repair application approach: The existing pipeline was cut and pulled through the casing for removal. Almost all of the existing casing spacers were broken, showed significant corrosion at bolts, and many failed to hold during pipe removal. Clock Spring spacers were custom cut to a width of 5 inches to provide protection of girth welds and the pipeline during installation.

Results: The crew of 10 installed 57 units, spaced 3.65 m apart, on new pipe sections in advance of field installation in eight hours. Sections were then assembled on-site. The entire replacement of the pipeline took approximately four days.

HDD under the Delaware River, Northeastern US

Pipe and defect details: A 30-inch pipeline with factory applied FBE coating, with 182.88 mm linear length installation into underground casing. The application of Clock Spring Casing Spacers was to prevent abrasion damage to the FBE coating during the pipeline pull and to then centralise the pipe in the casing after installation.

Repair application approach: To prevent contact of the pipe to the casing, the frequency of the spacer installation was calculated to be every 6.09 m. and the coil thickness to be 16 layers, providing a 1-inch standoff distance from the pipe circumference. The factory applied FBE coating was slightly abraded with sandpaper and solvent wiped with acetone to remove any dust prior to the coil installation. Crews installed 31 Clock Spring units on a 30-inch pipe as a casing spacer to protect the coating during casing removal. The units were 16 layers thick and cut in half to 1.83 m wide.

Results: The entire project was completed less than two days. The pipe installation was to be supported and moved forward over multiple roller hangers, and there was initial concern that this may damage the spacers. On completion of the project, there was no damage to the spacers. All remained firmly bonded to the pipe and the pipeline installation was a success.