

Trends in Pipeline Safety: Preventing Third-Party Damage

BY JENI HYLAND



In December 2017, a father and his adult son were killed as they tried to free a tractor stuck in a field. The tractor ruptured and ignited a 20-inch gas pipeline in Illinois. Two others were seriously injured. The explosion was on a 9,200-mile pipeline system that transports natural gas from Texas and Louisiana to Chicago; the

company indicated a “third-party strike” as the reason for this tragedy. This is only the most recent example of the many incidents that happen each year.

In the nearly 20-year period 1994-2013, the Pipeline and Hazardous Materials Safety Ad-

ministration (PHMSA), a U.S. DOT agency, has collected data on natural gas pipeline accidents deemed significant. The resulting fatalities from gas pipelines within the United States account for 363 lives lost. There have also been 1,392 injuries, and more than \$800 billion dollars in property damages.

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Excavations which accidentally strike and damage a pipeline (called third-party strikes) are the primary cause of loss in gas pipeline integrity. Such events account for approximately 40% of all pipeline strikes, and can result in fatalities or injury requiring hospitalization, unintentional fire or explosion, and substantial repair/remediation costs. The potential fallout from an incident can be very costly and, most concerning, a huge liability to our safety. Preventing third-party damages is of paramount importance to all gas companies.

Due to the severity of these types of incidents, most municipalities require impact prevention in High Consequence Areas (HCA). Examples of HCAs include urban areas, areas near refineries, areas near drinking water sources and road crossings. While each municipality is a little different, impact prevention is recognized as a necessity.

Conventionally, reinforced concrete has been the material of choice for impact prevention. Unfortu-

nately, there are a few downsides to concrete impact protection slabs. There is risk of the pipe being damaged if the slab sinks or is pushed into the pipeline. The concrete interferes with the pipeline's cathodic protection and there is a risk of corrosion of the concrete reinforcement. Additionally, when maintenance is required for this pipeline, the cement slab must be destroyed. Once the maintenance is finished, a new slab needs to be installed. Concrete is heavy and cranes are often required to install these slabs.

Recognizing these issues with concrete slabs, the research and development department of GDF (GAZ DE FRANCE), in conjunction with OVERPIPE, created an HDPE (High Density Polyethylene) plate, designed with a high impact resistance. These plates are yellow in color to serve as early visual warning of the presence of the gas pipeline. Other benefits include quicker, safer and lower installation costs compared to concrete. And, as the plate is made from recy-

clable plastic with drainage holes, there is no risk of the plates corroding, no risk of interference to the pipeline's cathodic protection, and no risk of pipe damage from the barrier (the PE slab does not sink, even in swamp conditions). In instances where maintenance is required on the pipeline, the plates can be easily removed and reinstalled after maintenance is complete.

As this innovative product catches on, we can expect to see reduced installation and maintenance costs. But, more importantly, we can expect a reduction in unintended pipeline third-party strikes, fatalities, injuries and property damages, making our industry significantly safer. **DP**

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