



EARTH, WIND—AND FIRE: PIPELINE ISOLATION

People across the world depend daily on pipelines for essentials like electricity, water and gas. Because of these time-bound demands, it is common practice to isolate, or complete repairs on a pipeline while product continues to flow rather than shut it down. These procedures are routine. In a nerve-racking departure from the norm, however, a fire eruption involving a natural gas liquid (NGL) pipeline struck by a trencher called for an emergency isolation—while the pipeline was still on fire. The operator was forced to burn off product rather than extinguish the line.

After receiving the call for this emergency job, T.D.

Williamson (TDW) hot tapping & plugging (HT&P) technicians were on-scene with all necessary equipment within 48 hours. The situation was daunting. Technicians would need to tap into the live line just 45 meters (150 feet) from the blaze.

In a truly unique achievement, TDW technicians performed a STOPPLE® Train isolation on a pipeline while it was on fire, enabling the operator to expel the flames, expedite repairs and restore service to the pipeline within 88 hours from the time the line was struck—an almost unheard-of turnaround time.

Volatile Challenge

When a 15-meter (50-foot), 125-ton trencher struck a 20-inch NGL pipeline carrying a mixture of ethane and propane, an explosion cascaded into the air, shooting flames to a height of 91 meters (300 feet). With the

overhead electric line destroyed in the blast, the main line valve (MLV)—which enabled emergency isolation—was non-functional. The operator was left with no way to isolate the line.

Swift Response

After receiving the call, TDW promptly sprang into action. The fire roared on, fed by a continuous flow of NGL, which ignited as soon as it reached the rupture site. Flames prevented crews from removing the trencher from the strike area. Furthermore, if fire was pulled back into the pipe, a secondary explosion and hazardous “cloud” environment was imminent. With the MLV non-functional, an external bypass was set up to divert flow from the rupture site. TDW quickly established controlled conditions for burn off by performing a STOPPLE® Train isolation to prevent more NGL from reaching the rupture. Before making the tap, a functional leak test (FLT) was performed under a 50-psi blanket of continuously

flowing nitrogen, an inert gas, both to ensure all equipment was sound, and to help expel flames and prevent fire from being drawn back into the line. FLT’s are normally performed to match line pressure. However, since this pipeline had no internal pressure due to the rupture, TDW technicians recognized that a low PSI was needed to avoid introducing damaging external pressure on the line. Continuous temperature monitoring verified that fire had not been pulled into the pipeline.

The STOPPLE® Train Solution

With the STOPPLE® Train’s double block and bleed (DBB) technology, two independent plugging heads were inserted into the line through a single fitting, eliminating the need for multiple taps.

Once the system was set, the area between the heads was bled through a bleed port. To ensure no leaks occurred, the port was left open and monitored so that if any product seeped past the primary seal, it could be removed from the line and safely captured or evacuated to a safe location. The STOPPLE® train created a zone of “zero energy,” ensuring no product escaped past the STOPPLE® barrier.

Even with TDW’s wealth of expertise in rendering diverse HT&P and isolation services globally, no operation rivaled this one. Acting with urgency on behalf of the customer, TDW engineers determined the safest plan of action and quickly implemented it, pooling various team leaders and equipment

from multiple TDW service centers. On-site within 48 hours, TDW restored full service to the pipeline an astonishing 88 hours later.



FIGURE 1 STOPPLE TRAIN ISOLATION TECHNOLOGY