

Miscellaneous Line Stop Case Studies

Cameco Cigar Lake Uranium Mine is the largest uranium mine in the world and its development flooding via a fissure in August 2008 at the 420-meter level and completely stopped work. To stop the flooding, Cameco had to create a barrier in that level that would completely seal off the area of inflow. Cameco Project Engineer Brian Dixon, decided to use an inflatable tunnel seal (ITS) from Petersen Products Company. The ITS, which is a cylindrical plug designed to expand to approximately seven meters when inflated, had to be positioned and oriented precisely by an ROV, and then filled from the surface not once, but twice: once with water to check position, and then with a custom formulated grout to form a permanent seal. To further seal off all inflow, more grout was pumped into a series of drilled holes east of the bag. In October 2009, after all grout was set, Cameco reported that the water inflow had "been remediated", and in February 2010, dewatering crews reentered the working level of the mine, 480 meters (1,575 feet) beneath the surface and 60 meters (197 feet) below the previously flooded 420L level.

Grace Titan 60" Water Pipeline: When Brian Simon, a project manager at Grace-Titan DVBE (based in Redding CA) first looked at the Potter Valley Bypass job it looked difficult. Grace-Titan was being asked to remove a section of the penstock that supplies Pacific Gas & Electric's (PGE) Potter Valley hydroelectric plant and install a Y-branch. But the 100 year old five-foot diameter penstock and Grace-Titan was told to expect flow leakage as high as 1,200 gpm, and to account for this preparation and design. Instead, a physical block was needed and an existing 18 inch manway presented the best opportunity. "We hadn't done anything like this before, so we did some research," says Simon, "and it seemed like an inflatable plug was the way to go." Petersen Products fabricated a plug that could be folded for insertion through the manway, then inflated with water to fill and block the penstock. "We opened up the manway and inserted the plug. Once in place, the plug was tethered with dual aircraft cables, the plug sealed well, and held for the entire seven weeks of the project."

Duke Power needed to plug a 42 inch line located 12 feet under the basement of a nuclear power plant. The piping for fuel, chemical transport, water supply, and cooling needs is typically very complex and subject to high temperatures and pressures. Shutting down entire lines is not practical as realities dictate that plants must be kept running more or less continuously. Downtime is simply unacceptable so it is necessary to plug a pressurized pipeline. Plugging the nuclear power plant line went smoothly and the plug was kept in place for a week before being pulled.

Southern Louisiana Refinery had two banks of exchangers operating, but one was contaminated by leaking gas. To fix the leak and keep at least one exchanger bank working, they would have to plug a 16 inch inlet under 180 psi, with temperatures up to 230°F. A Petersen® inflatable Line Stop Plug "bag" was inflated with diesel, "that way, if there was a leak, there wouldn't be contamination but the bag was in for the six months and didn't fail."

US Steel Gary Works needs to periodically block the flow 11.5' ducts to allow cleaning and maintenance that includes welding. They use Petersen's custom Duct Seals shaped similar to a large truck inner tube with the center closed with a web. The outer cover is made from a heavy Kevlar fabric for puncture resistance and to help protect from weld splatter.

72" Petersen® Multi-Flex™ Line Stop for a Valve Change: Energy Northwest in Washington State had an underground 72" water line operating at 28 psi. The pipeline needed to be plugged to replace a valve on the downstream side. The 72" pipe was excavated and a 72" X 36" Tapping Sleeve was installed on the pipe. A Hot Tap machine was utilized to make a 36" Hot Tap through a 36" line and a Petersen® 129-Series Multi-Flex™ Line Stop Plug was installed through the 36" Hot Tap Valve under pressure utilizing a plug Launch Cylinder.

The 129-Series Plug was inflated to 56 psi (two times the operating pressure) and the 72" Valve was changed out. The Plug was removed from the line and a completion plug installed on the tapping sleeve to allow removal of the 36" Valve. A blind flange was then installed on the completion valve to complete the job.