CUSTOMER SITUATION:
Shell Philippines Exploration B.V. (SPEX) operates the Malampaya Gas-to-Power Project offshore, The Philippines. The gas export line (GEP) transports gas from the shallow water platform to an onshore processing plant near Batangas. A major shutdown was scheduled to allow for a range of rejuvenation work to take place, including replacement of the main emergency shutdown valve (ESDV) and a neighbouring manual block valve on the GEP. SPEX wanted to achieve this with minimal disruption, without going to the considerable expense of bleeding down the 550 km GEP.

TDW SOLUTION:
To avoid bleeding down the line, T.D. Williamson (TDW) executed a pipeline pressure isolation on the line using its remote-controlled SmartPlug® pressure isolation technology to isolate the affected area from hydrocarbons. This would create a safe environment for SPEX to replace the valves.

Given the 30-day shutdown window, careful planning of feasibility, tool transportation, customs clearance, and other essentials was extremely important. One year before the operation, TDW carried out a feasibility study to assess the use of SmartPlug® technology. SPEX was concerned about the piggability of the line because it had encountered problems when a valve located closest to the launcher failed to open properly, damaging an inline inspection tool. To address this, TDW ran a gauge pig from the platform to the receiver at the Malampaya onshore gas plant to verify piggability along the line. The piggability study assessed the SmartPlug® tool’s ability to negotiate the pipeline to the set location and be retrieved back to the launcher.

With feasibility confirmed and everything in place, the SmartPlug® tool was launched and pigged using nitrogen pumping services to the set location in the riser. Upon arrival, the first SmartPlug® tool plugging module was set at full line pressure before the line was depressurized to half of the pipeline pressure from the launcher side. Subsequently, the second plug module was set and the pressure in the line was bled down to zero. After monitoring the annulus pressure between the two plugging modules for four hours to verify sealing, the situation was deemed safe for valve replacement to commence. The launching operation - including pre-launching activities, pigging, setting, and monitoring - was achieved in less than 24 hours.

During the next 25 days, while the SmartPlug® tool remained in the pipeline, both valves were replaced and the integrity safety barrier in the GEP was re-established. After installing and testing the valves, the SmartPlug® tool was unset and retrieved.
**CUSTOMER BENEFIT:**

It was critical to SPEX that the shutdown and pipeline isolation operation be executed precisely according to plan. Restoration of fully functional ESDVs was essential, as was the requirement to complete the operation in the shortest possible time. By using the SmartPlug® pipeline pressure method, which relies upon pressure isolation technology designed to withstand maximum allowable operating pressure, repair work and valve replacements were carried out without removing the contents of the entire pipeline. Had this been necessary, it would have caused considerable disruption and emitted a large volume of gas into the environment during flaring. The entire operation was completed well within the 30-day scheduled shutdown window established by SPEX.