No longer a pipe dream

The cycle phenomenon is a major concern for oil and gas operators running carbon steel pipelines. **Total Hazardous and Integrated Solutions** has been refining its technology for the quick, efficient and effective decontamination of these pipes to keep mercury levels in check.

The oil and gas industry is aware of the cycle phenomenon, whereby mercury is absorbed into the surface matrix of carbon steel pipelines during the process and transportation of contaminated hydrocarbon media, and its subsequent ability to desorb out from the steel surface and return to those same – or new, uncontaminated – streams. However, the fate of the pipeline itself falls under further limitations with lengthy, costly and typically unverifiable results.

As a growing concern among operators and companies around the world, the decommissioning, passivation and abandonment of contaminated subsea pipelines has always had its limits, and current legislation only deals with the decontamination of free (adsorbed) mercury from pipeline internals prior to its decommissioning.

While concerns remain high for the fate of carbon steel pipelines – which have inevitably become contaminated during the transportation of mercury-contaminated hydrocarbon – and produced water streams, viable solutions have been limited to costly and hazardous applications involving filling pipelines with acid or flushing with hazardous lixiviant solutions. These procedures have varying rates of success, and there is very limited analytical data or in-situ analytical evidence to prove its effectiveness.

One step beyond

Taking chemical technology to the next step in order to apply it in an integral-yet-remote environment where efficacy and efficiency are key factors has been a huge undertaking – not only in terms of producing a chemical formula that can desorb mercury contamination from the surface scale and its subsurface matrix, and take it into solution, but also be able to perform this task in a short time frame while reducing the total volume of chemical required using conventional methods. Costly decommissioning, demolition and removal then become less of a requirement, and reuse and/or true passivation can be carried out.

The removal of absorbed mercury contaminant levels as high as 3%wwt (30,000ppm) has been proven to be 100% successful and 100% repeatable with onshore decommissioned pipe sections prior to disposal after only a short application. With current trials being carried out for the process to be adopted for subsea applications, preliminary results continue to provide the desired effect, while chemical loading, contact times and chemical volumes are still being optimised to ensure the application can be completed in a single pass.

THIS is carrying out trials for the process to be adopted for subsea applications, and preliminary results continue to provide the desired effect.

Where the capture and analysis of the resultant solution can be analysed, this does not provide evidence that the scope has been achieved – only of its partial success. The efficiency of the chemical still has to be verified, and the development of in-line technology to address this is already being designed and tested.

To complement the application, additional R&D has been carried out to reduce, treat and stabilise the resultant chemical waste, and ensure its compatibility for safe disposal in compliance with TCLP regulations using encapsulation and solidification technology.

Here and now

It is no longer a pipe dream where subsea pipelines can be fully decontaminated prior to abandonment, product change and/or disposal. Where mercury in subsea pipelines and PLEMs dictated the high-cost removal and disposal of contaminated facilities, this is set to become a requirement of the past.

The latest technology, as developed by Total Hazardous and Integrated Solutions (THIS), is changing the landscape of historically hazardous and costly applications for the better. A safer, quicker, environmentally sound and cheaper solution is available, and THIS looks forward to helping you achieve your decommissioning and waste disposal requirements in a proactive, effective and responsible manner. ■

Further information
Total Hazardous and Integrated Solutions
www.isthesolution.com