SureTherm℠ Service

TARGETED HEAT PLACEMENT IN REMOTE LOCATIONS TO REMOVE PIPELINE DEPOSITS

Halliburton Pipeline and Process Service is currently developing the SureTherm℠ service which uses a time-delayed exothermic chemical technology to generate a significant quantity of heat after a calculated delay time (Figure 1).

This proprietary technology enables delaying of the exothermic reaction so that it can be pumped into a pipeline to a specified location where the generated heat (Figure 2) can be used to treat deposits such as paraffin wax and hydrates or to add heat to chemical treatments.

The SureTherm service provides important benefits:
- Significantly improves paraffin removal efficiency compared to traditional treatments
- Eliminates risks associated with the use of mechanical scrapers in a reduced ID or restricted pipeline
- Can be applied online (with production) or offline (pipeline shut down)

PARAFFIN DEPOSITS IN SUBSEA PIPELINES

Paraffin wax is one of the most common pipeline deposits leading to decreased production in oil pipelines (Figure 3). Two widely used remediation approaches include mechanical scrapers and/or solvents.

MECHANICAL SCRAPERS POSE RISKS OF COMPLETE BLOCKAGE

Internal restrictions caused by paraffin deposits increase the risk associated with common removal methods based solely on the use of mechanical scrapers.

The potential of a total pipeline blockage resulting from failure of a scraper to pass through an excessively restricted pipeline is often a strong deterrent to the implementation of a cleaning program using mechanical scrapers.

SOLVENT PERFORMANCE IS DECREASED DUE TO THE LOW TEMPERATURES

Effective paraffin solvents are available but solvents are most effective when applied at elevated temperatures. Due to the low internal temperature associated with most subsea pipelines, the ability of solvents to remove significant quantities of paraffin is greatly reduced. This decreased efficiency results in the requirement of large treatment volumes of solvent, long treatment times, and ultimately a high cost.

SURETHERM SERVICE ENHANCES SOLVENT TREATMENTS

Depending upon the specific requirements, the SureTherm service can be applied alone or synergistically with an effective paraffin solvent such as Halliburton’s Paragon™ solvent. This
combination of SureTherm and solvent ensures that the solvent is being applied at elevated temperatures resulting in efficient removal of paraffin from restricted pipelines.

**ONLINE OR OFFLINE CLEANING**

In most cases, the SureTherm service can be applied while a pipeline is in operation with minimal disruptions to normal production. The components can be mixed and injected directly into the production flow.

As heat is released, the temperature of the pipeline fluids are elevated and the paraffin gradually melts or dissolves into the production flow. If the pipeline is shut down, the SureTherm service treatment can be designed to deliver a targeted release of heat at the location of the most severe paraffin deposition. Appropriate addition of a solvent such as Paragon agent can be considered to enhance the paraffin removal process.

**OPERATIONAL ASPECTS**

Any SureTherm service operation begins with a careful consideration of the engineering aspects of the treatment. In addition, testing of the proposed SureTherm formulation must be completed with the fluid that will be used for the treatment. This confirms that the desired delay time can be achieved.

The SureTherm service is based on a catalyzed reaction between two components to produce a large amount of heat. The catalyst used in the SureTherm service is a proprietary, solid-phase material that provides a delay in the onset of the chemical reaction. Based on temperature, allowable treatment pressure, and the chemistry of the water system, separate solutions containing appropriate concentrations of the two basic components are prepared and stored in separate tanks. When the treatment is to be pumped, an appropriate amount of catalyst is added to one of the components and the two separate fluids are simultaneously injected into the pipeline (Figures 4).

**ENHANCED ENVIRONMENTAL PERFORMANCE**

The reaction products are sodium chloride (common salt), water, nitrogen gas and heat. Compared to traditional paraffin solvents or dispersants, both the initial reactants and reactant products associated with the SureTherm service pose considerably less threat to personnel and the environment.

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SureTherm™ service is currently undergoing development.

For more information, contact your local Halliburton representative, visit us on the web at www.halliburton.com or email pps@halliburton.com