MIC RELATED COILED TUBING FAILURES AND EQUIPMENT DAMAGE

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ABSTRACT
Microbial influenced corrosion (MIC) has been implicated in few corrosion-related challenges in the well service industry in the past. Recently, the industry is observing an influx of MIC-related equipment damage. This upsurge of MIC coincides with a switch to unconventional water sources. As fresh water for fracturing operations and well interventions becomes less available, operators are forced to use alternative water sources such as recycled flow-back water, produced water, and even ‘grey water’ from wastewater treatment plants. In some instances, recycled water is sold from one operator to another for operations on other pads. Regardless of the water source for a particular well treatment operation, the same water-hauling equipment and tanks are used for successive hydraulic fracturing operations.

This ‘communal’ use of water hauling and temporary water storage equipment is an ideal situation for bacteria to move from one water repository to another. Even if the water source used to supply water for oilfield operations is free from harmful bacteria, it may still become contaminated - in transport or temporary storage vessels - before it is pumped downhole.

This paper is an overview of premature coil tubing and other well servicing equipment failures and pumping equipment damage that is related to MIC. Metallurgical, chemical and microbial analysis of the scale as well as representative water samples have been conducted to determine if the corrosion was the result of sulfur-reducing bacteria (SRB) or merely pitting common to oil field equipment from pumping hydrochloric acid and other corrosive fluids. This paper will explore the potential source(s) of the bacteria, the impact to the equipment that was exposed to the bacteria, as well as what is being done to mitigate the problem.

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