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No Pipe Body Downgrades - Improved Corrosion Mitigation Coating System Provides Significant Operator Savings

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Abstract

Objectives/Scope.

Tubulars used in completion and intervention riser applications are exposed to both the marine environment and corrosive oilfield chemicals, including salt-based completion brines. Eight years of field history from one company shows a loss of \$24.3 million from pipe body downgrades due to corrosion and pitting in these salt-based environments.

Methods, Procedures, Process.

This paper documents an extensive development effort spanning over eight years including: research of completion parameters and environments, evaluation of 18 potential external coating/salt neutralization products, multiple lab tests, field trials, as well as testing surface preparation methods, coating application, dry time and adhesion tests. The development of application procedures and construction of an external coating facility are discussed as are rig pipe washing systems and corrosion mitigation procedures.

Results, Observations, Conclusions.

The result is an improved corrosion mitigation coating system. A modified epoxy phenolic internal coating combined with a metallic-based, moisture-cure polyurethane encapsulating external coating. Since 2015, over 1,700,000 feet, 44,000 joints, of completion and intervention tubulars utilizing this system have been deployed with zero pipe body downgrades due to corrosion or pitting, and zero operational issues. In addition to reducing replacement cost and loss of capital, this system provides the ability for longer deployment of the pipe on a multiple well program reducing logistics costs.

Novel/Additive Information.

Extensive research, testing, field trials, and successful field deployments have resulted in an improved corrosion mitigation coating system providing significant savings to operators. Pipe body downgrades due to pitting and corrosion have been eliminated. Improved corrosion resistance has allowed multiple-well deployments reducing shipping, inspection, and repair costs. Ultimately this results in longer life of the tubulars reducing total cost of ownership.

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