



Operator Prevents Paraffin Deposition in 20-mile Deep Water Subsea Tieback

FLUID MODELING AND SYSTEM MONITORING ENSURE OPTIMIZED PERFORMANCE OF MXUC 3-2721 PARAFFIN INHIBITOR

GULF OF MEXICO

CHALLENGE

Minimize the risk of flowline restrictions due to potential paraffin buildup in a 20-mile stretch of tieback from deep water well to offshore platform.

SOLUTION

- » Conduct extensive fluid testing, modeling and analysis in Multi-Chem laboratory, using:
 - » OLGA® Dynamic Multiphase Flow Simulator
 - » Cold finger product selection tests
 - » Product optimization tests
- » Inject Multi-Chem's MXUC 3-2721 umbilical certified paraffin inhibitor into tieback
- » Routinely sample and monitor paraffin inhibitor to maintain optimum performance

RESULT

- » Zero downtime related to paraffin deposition since startup of well
- » No evidence of paraffin deposition in the flowline, per current modeling and analysis

ANALYZING PARAFFIN CONTENT AND CHARACTERISTICS

The operator was concerned about paraffin buildup in one of its producing gas/condensate wells located in the Gulf of Mexico. The well was located at a water depth of approximately 2,100 ft. with a tieback to the offshore platform via a 20-mile insulated flowline. A sample of the produced fluid was collected for laboratory analysis, which showed the condensate contained approximately 2.2% paraffin content with a wax appearance temperature (WAT) of approximately 90°F (32°C). A temperature profile of the fluids along the flowline was developed using OLGA® Dynamic Multiphase Flow Simulator. The modeled results indicated that the condensate temperature dropped below the WAT approximately 3.5 miles from the wellhead to the platform, and reached a minimum temperature of 55°F (13°C) just before the base of the riser. Since the flowing temperature of produced condensate was determined to be below the WAT, there were concerns of paraffin deposition in the flowline and need for preventive treatment.

SELECTING THE HIGHEST PERFORMING PARAFFIN INHIBITOR

Multi-Chem completed extensive fluid testing, modeling and analysis for this pipeline system to develop cold finger product selection testing parameters that would most closely simulate field conditions. Cold finger tests were then completed to select the highest performing umbilical certified paraffin inhibitor for this application. Multi-Chem's MXUC 3-2721 umbilical certified paraffin inhibitor performed best in cold finger testing, and subsequent optimization testing was completed for this product. Upon completion of all testing, a recommendation was made to inject MXUC 3-2721 downhole via umbilical and capillary delivery.

The MXUC 3-2721 paraffin inhibitor was applied in the field at a rate of 1,000 ppm based on condensate production. Oil samples are collected quarterly for blank cold finger testing to ensure high performance of this paraffin inhibitor treatment. Also, chemical injection rates and flowline differential pressures are monitored daily to optimize the application. Since the startup of the well in 2012, the operator has not experienced any downtime related to paraffin deposition. Furthermore, current modeling and system analysis indicate that no significant wax deposits have developed in the flowline.

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