Drag Reducing Agent Improves Flow

A Staff Report

In many cases, pipeline operators can use flow improvers to compensate for lower pressures.

Drag-reducing agents have proven to be effective in increasing pipeline flow, even when pressure is decreased significantly. The products, LiquidPower™ Flow Improvers, are produced by ConocoPhillips Specialty Products Inc. (CSPI). It was deployed when a smart pigging tool found anomalies in a segment of a crude oil pipeline which feeds a refinery in Texas.

As a result of this discovery, pipeline integrity personnel directed the operator to decrease the maximum operating pressure. This in turn meant a substantially lower crude flow rate to the refinery. A member of the pipeline operations team noted that while the company wanted to err on the side of safety, but knew that the 20% decrease in operating pressure would mean a potentially huge loss of revenue. The refinery in question runs at maximum capacity all of the time, and any reduction would surely mean a reduction in revenue.

But the pipeline and the refinery saw virtually no effects from the loss in pressure, and what could have resulted in a substantial economic loss was avoided. The pipeline operator avoided this potential loss by increasing the amount of drag-reducing agent injected into the pipeline. Prior to the smart tool run, the LP™ 100 Flow Improver was already being injected into the pipeline to achieve flow increase. Now, all the operator had to do was increase the level of flow improver injected into the pipeline to compensate for the loss in pressure. With the increased injection, the operator was able to maintain its scheduled guarantee to the refinery.

"If we had done nothing, or left the flow improver injection rate at the level it was prior to the smart tool run, we could have lost approximately 2,400 barrels per day," said the pipeline scheduler. A new flow improver injection system had to be installed to handle the increased injection into the pipeline, but the operation proved to be seamless. Moving quickly, the CSPI team installed an injection skid at one of the pump stations to accommodate the increased flow improver levels. In just a few days, the new injection skid was fully operational and the flow levels were back on target.

Injection skid installed at pump station to accommodate increased flow improver levels.

With the skid installed, the pipeline company personnel anticipate continuing the injection of flow improver at the additional pump station injection site for power optimization purposes, even once the repairs are made to the pipeline and the pressure constraint is removed. With pipeline integrity regulations becoming more stringent, operators are looking for ways to alleviate the effects of lowered maximum operating pressures.

"As the industry works to improve the integrity of the nation's pipeline infrastructure, there are more instances where regulations require operators to temporarily reduce line pressure based on integrity assessment results," said the director of pipeline integrity for the pipeline company. "In many cases, pipeline operators can use flow improvers to compensate for decreased throughput caused by the pressure reduction, avoiding the loss of revenue to refineries and allowing scheduled deliveries to remain unaffected."

The use of flow improvers in this way is becoming more popular, but some pipeline operators do not realize the value that increasing the injection of flow improvers can bring to the pipeline and the refinery. "We want people to recognize that using LiquidPower™ Flow Improvers can make what looks like a dire situation, have virtually no economic consequence," said Martin Guillory, senior technical sales representative for CSPI. "It's becoming one of the ways that people are thinking of our (CSPI's) flow improvers differently." ■