



# Operator Performs Inline Inspection Pigging in Ethylene Pipeline with Nitrogen

## NITROGEN DISPLACEMENT FOR ILI PIGS SAVES UPTIME AND COST IN PLANNED MAINTENANCE OPERATION

BRAZIL

### CHALLENGE

- » Avoid cost of water treatment
- » Reduce pipeline downtime
- » Minimize or avoid the use and disposal of high volumes of water
- » Control the pig speed during the inspection run

### SOLUTION

- » Use nitrogen, instead of water, as a propellant for the pig displacement
- » Utilize the appropriate remote pressure control

### RESULT

- » Avoided costs of water treatment and disposal
- » Eliminated need for a pipeline drying operation
- » Controlled pig velocity
- » Successfully collected pipeline data information, using ILI pigs

### OVERVIEW

An operator producing thermoplastic resins was using large volumes of fresh water to flood an ethylene pipeline to perform inline inspection (ILI) pig displacements. The ILI was performed as part of a tight schedule of planned maintenance at a petrochemical plant. On completion of the ILI, the ethylene pipeline had to be dewatered and dried in a time-consuming operation.

### CHALLENGE

A large volume of fresh water – 1011 m<sup>3</sup>, equivalent to 54 kilometers (34 miles) of ethylene pipeline – was used in the flooding operation. As there was not enough storage capacity at the receiving end, an expensive water treatment system was required to receive, treat, and filter the water so that it could be discharged into a stream next to the pig receiver. In addition, approximately 2 to 2.5 days and significant costs were required to dry the ethylene pipeline. Between 380 to 400 foam pigs were used to ensure that the requirements of the pipeline drying operation were achieved.

The pipeline route passed over a hill with an altitude difference of 800 meters (2,624 feet). When the ILI tool was propelled with water, it accelerated to an excessive speed, which made it impossible to collect accurate inspection data.

Halliburton Pipeline and Process Services collaborated with the customer, persuading this operator to adopt a new solution that was different from the method it had used many times before.

### SOLUTION

The Halliburton Pipeline and Process Services team recommended a new solution that uses nitrogen displacement, instead of water, for the ILI pigs. This solution was chosen for the execution of the project.

For this service, a cryogenic nitrogen pumping unit, four cryogenic tanks, and a monitoring system were mobilized. In addition, a planning and logistics program was developed to supply liquid nitrogen to the tanks while the pigging operation was performed.



*Remote pressure control discharge flow manifold at pig receiver location*

Halliburton presented a track record of similar operations with nitrogen, demonstrating

the benefits of using nitrogen during pig displacement operations. In addition, Halliburton supplied appropriate equipment, including a remote pressure control manifold that could maintain constant pig velocity along the pipeline constant during the displacement, thus avoiding unwanted pig acceleration.

#### RESULT

By using nitrogen, instead of water, as a propellant for the pig displacement,, the expensive cost of the water treatment at the receiving end was avoided and the total operational time to dewater and dry the pipeline was saved.

During the ILI run operation, the pig velocity was controlled as planned, using the remote pressure control manifold to control the discharge from the pig receiver. The ILI runs were completed, and the ILI pigs successfully collected all pipeline inspection data.

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