Benefits for snubbing, jetting, and other nitrogen applications for oilfields

Simone Kothare
Air Products and Chemicals Inc.
7201 Hamilton Boulevard
Allentown, PA 18195-1501

Benefits for other applications

Snubbing

In recent years, snubbing has become a popular completion and workover tool versus its traditional use as a well control response tool. The unique snubbing unit allows the workover of an oil or gas well to be performed under pressure without the use of "kill" fluids in the well which could result in well damage.

Nitrogen is used in snubbing operations for safety purposes, creating an inert blanket to prevent hydrates from developing in the blowout preventers (BOPs) and surface lines. It also prevents or restrains hydrocarbons from being released from the well. Should there be a leak, the release would be an inert, non-flammable product vs. a flammable, hazardous hydrocarbon product.

Nitrogen improves the safety of snubbing operations by providing an inert blanket to prevent development of hydrates in blowout preventers and surface lines.

Jetting

During jetting, nitrogen is used to remove fluids from the well bore when the lifting energy of the formation is temporarily lost. Nitrogen jetting lifts can be used to lighten hydrostatic head to circulate wellbore fluids out and reduce surface pressure, allowing formation pressure to lift gas or oil to production.

Nitrogen flow may vary between 300-3,000+ scf/min and pressure may range from 1,000-5,000 psig.

Well completions and workovers

Wells are sometimes capped off after drilling operations are completed. This requires perforation of the production string and displacement of the hydrostatic fluid head to get the well to flow on primary pressure. Nitrogen may be used to lighten the hydrostatic fluid head thereby facilitating well clean out. Nitrogen is also used for workovers, which are subsequent clean-outs that are performed regularly to remove hydrostatic fluids.

Nitrogen flow may vary between 350-3,000 scf/min and pressure may range from 1,000-5,000 psig.

Cementing

Adding nitrogen to a cement slurry will reduce the cement hydrostatic pressure column but still maintain compressive strength. This is done when the formation pressure is too low to hold the hydrostatic pressure column of cement to cover and separate zones.

Nitrogen flow may vary between 200-1,500 scf/min and pressure may range from 1,000-3,000 psig.

Under balanced drilling

Nitrogen is commonly used in under balanced drilling where the pressure in the well bore and bottom hole is less than the formation. Because it is inert and noncombustible, nitrogen allows for production during drilling as well as protection of the formation.

Nitrogen flow may vary between 1,500-3,000 scf/min and pressure may range from 1,500-3,000 psig.

Pipeline purging and drying

Because it is inert and dry, nitrogen is used to displace hydrocarbons in pipeline purging or to push a "pig" down a pipeline during cleaning operations. It is also used to dry chemical pipelines to very low dew points or for general inerting during plant turnarounds.

Nitrogen flow may vary between 100-3,000 scf/min and pressure may range from 300-3,000 psig.

Reservoir pressure maintenance

When the primary pressure of a reservoir is gradually depleted over time, additional energy must be added to the reservoir to drive the reservoir products to the surface. Nitrogen or natural gas can be used to provide this additional pressure.

Nitrogen flow may vary between 1,000-3,000+ scf/min and pressure may range from 1,000-5,000 psig.

For more information, please contact us at:

Corporate Headquarters
Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, PA 18195-1501
T 800-654-4567
F 800-272-4449
gigmrktg@airproducts.com

For orders, please contact Air Products Customer Service at 1-800-224-2724

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