

ARC strategies benefit dual-train cryo, frac plant

Implementation of advanced regulatory control (ARC) proved effective for enhancing cryogenic plant and fractionation plant control at the Aux Sable Liquid Products Inc. dual-train cryogenic NGL recovery and separation plant near Channahon, Ill.

The project focused on advanced control strategies for two identical parallel cryogenic trains for the facility and the single-train NGL fractionation unit, which processes the recovered NGLs from the cryogenic units.

Each cryogenic train incorporates Ortloff's Recycle Split Vapor (RSV) and Gas Sub-cooled Process (GSP) processes. For the RSV process, an additional reflux stream is introduced into the demethanizer. These processes allow operating flexibility of the extraction facility over a wide range of ethane recoveries, nominally from 20% to 95%.

The control strategies are designed for smoother operation of cryogenic trains with reduced upsets caused by inlet-btu changes, loss of RSV flow, or other conditions. These strategies also help the plant operate the two trains either in pressure-control mode or rate-control mode.

Implementing these strategies achieves the following:

- Minimization of production losses from a shutdown of a cryogenic train due to an upset in RSV flow.
- On-spec NGL product maintenance and enhanced NGL recoveries by operating at higher CO₂ content in the demethanizer bottoms.
- Less variation in demethanizer bottoms flows, which will help the fractionator train run more smoothly.
- Reduced residue-compression horsepower and more stable residue control by maintaining a minimum differential pressure across each of a maximum of five residue-delivery control valves that may be in service at any one time.

Each train can operate in pressure-control mode or in rate-control mode, with the other train automatically assigned to the opposite mode. This allows the plant to meet nominations by automatically regulating the residue-compressor speed and the demethanizer pressure subject to several important constraints.

..... continued in Oil & Gas Journal

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Barry D. Payne & Associates, Inc.

10707 Corporate Drive • Suite 161 • Stafford, Texas 77477 • (281) 240-4488 • Fax (281) 240-3913
Billing • P.O. Box 1159 • Stafford, Texas 77497-1159