



## 100MSCFD GAS PLANT STUDY

### Overview

This project represented the design and construction in 2017/2018 of a large natural gas processing plant. In this case, the project was divided into forty-six (46) Construction Work Areas (CWA's), with a design team assigned for each CWA. In this case the Owner recognized that an Integrated Supply Chain Materials Management Execution Plan was required and contracted PointVerge™ (PVL). Together with the software: QuBR™, we focused on capturing and controlling the data being created in the Pipe Rack design models to address the problems being experienced. Several materials management issues were resolved on this project using PVL as follows:

PVL completed an audit and provided detailed comparisons of the Pipe Rack Modules BOM discrepancies in only two days. Result: The 3D Models issued to the Fabricators were substantially different than the 3D Model BOMs used for the Pipe & Fittings Purchase Orders and therefore supported the higher cost to fabricate the Group #2 Modules compared to the Group #1 Modules. A substantial revision to the Group #2 Pipe & Fittings Purchase Order was necessary which resulted in schedule delays.

### Material Management Processes

Due to the project schedule and remote location, the operator made the decision to fabricate pipe rack modules and transport them to site. Unfortunately, no single fabricator had the capacity to build all forty-two (42) pipe rack modules; therefore, the decision was made to split the order between two separate shops. Group #1 included nineteen (19) Pipe Rack Modules for CWA810 & CWA830 and Group #2 included twenty-three (23) Pipe Rack Modules for CWA840 and CWA860.

During the evaluation of the Pipe Rack Module Fabrication Contractor Bids, the operator's team observed an anomaly in cost between the Group 1 and Group 2 Pipe Rack Modules (i.e. Bids received from the Fabrication Contractors were all reflecting an approximate 5% higher cost for the Group 2 Modules over the Group 1 Modules while the cost of pipe & fittings was less than half for Group 2 Modules. (Group 1 PO total for pipe & fittings = \$882,606.63 and Group 2 PO total for pipe & fittings = \$393,417.80). The operator requested the engineering firm verify that the 3D Model BOMs match the PO quantities. The engineering firm made several unsuccessful attempts over a three-week period spending over one hundred man-hours to complete a comparison between the 3D Model BOMs and the PO quantities.

The PVL Team successfully provided quality 3D Model BOM's as required as well as comparisons at the various stages of design development to support Procurement Purchase Orders and Construction Contracts.

A problem was discovered by the PVL Team with the engineering firm's Structural Steel Material Take-Off files (i.e.: they could run the program 3 times on the same piece of steel and get 3 different answers). The PVL Team investigated the problem and confirmed there was an issue with CADWorx 2015 modeling software. The problem was solved when run with CADWorx 2017.

The Fabricator for the Group #1 Pipe Rack Modules duplicated the original "Free-Issued" Pipe & Fittings Order instead of "Topping-Up" the As-Built requirements. The PVL Team assisted with the management of surplus materials and supported the attestation of the Fabricator's Invoices. There were significant revisions to the Pipe Rack Modules post IFC Drawings being issued. Result: The PVL Team assisted with the procurement of additional materials as well as management of surplus materials. Also, supported the attestation of both fabricator's final Invoices.



## Results

- The operator recommended a Materials Management Strategy be developed early in the FEED phase of a project and included in the Project Execution Plan. An organization such as PVL should be integrated into the project engineering/ procurement/ construction team from start to finish would prove to be a definite benefit.
- The lesson learned on this project by the owner was to make sure the MEP is developed at the very first of the project. PVL being brought in only when the project was beginning to enter the fabrication and construction phases proved extremely challenging.

