CRYOGENIC GAS PLANT, AN EXAMPLE OF LIFECYCLE MODELING

VMGSim is a robust simulation platform you can use to create your plant models throughout your project’s lifecycle. Now you can get the power and the flexibility to solve your toughest process challenges and get a better return on your investment.

- **Design (Conceptual, FEED, and Detailed)**
- **Plant Commissioning, Startup and Training**
- **Plant Monitoring and Optimization**

### FEED Phase (Front End Engineering Design)
- Off design cases
- Process studies
- Initial equipment design (live link with HTRI and HEX design and rating)

### Conceptual Design Phase
- Screening studies
- Technology selection
- Economic justification
- Base case optimization

### Detailed Design Phase
- Datasheets (more than 100 datasheets included and updated live)
- Flare design
- Detailed equipment design
- Control strategy design

### Plant Commissioning, Startup and Training Phase
- Controls testing
- Loop tuning and checkout
- Operating procedure verification/validation
- Operator training

### Plant Monitoring and Optimization Phase
- Dynamic realtime shadow models
- Planning and profit improvement
- Emissions
- Advanced Process Control (APC) and optimization

Lifecycle Modeling with Dynamic Simulation
**IMPROVE YOUR PROCESS PERFORMANCE & ENHANCE YOUR PROCESS UNDERSTANDING**

Gas plants are dynamic and rarely operate at a true steady-state. As a result, changes in feed flows and compositions, external disturbances, and equipment performance all continually affect your plant operations. With VMGSim you get a dynamic simulation platform for the entire lifecycle of your modeling development:

- Simulate process operations during upsets
- Evaluate process design, equipment sizing, and control system strategies
- Perform capacity evaluations, debottlenecking studies and plant-wide optimization
- Develop start-up, shut-down, and emergency handling procedures
- Perform regulatory control system configuration and tuning studies
- Perform step-testing in an off-line environment for multivariable control design
- Perform rigorous blowdown / depressuring safety studies
- Evaluate relief loads from causes such as fires, reflux pump or power failures

You get enhanced capabilities by combining process and control system configuration in dynamic models, giving you a better understanding of how processes respond to changes in both manipulated and disturbance variables.

In Dynamics, improve your process performance and enhance your process understanding by executing a comprehensive virtual plant model and making process and control improvements.

And with Steady State and Dynamics integrated into one platform, you get the ability to include Steady State and Dynamic models in the same file/case on different flowsheets.

**OPC CONNECTIVITY**

- Get OPC connectivity capability in both Steady State and Dynamics
- Perform as OPC Server or as Client
- Use OPC connectivity to connect models to a DCS, plant historians, PLCs, other software (eg. OLGA), and more
- Use VMGSim as an Operator Training Simulator (OTS) platform
- Send changes to your VMGSim model through DCS interface automatically and get results sent back to DCS once your calculations are made

**HYDRAULICS AND EQUIPMENT SIZING**

Define hydraulic details and equipment sizes/geometry, enabling capacity evaluations and debottlenecking studies. These inputs allow detailed equipment design, such as separator sizing for correct holdup and inventory.

**CONTROLLER DESIGN AND TUNING**

- Analyze various controller configurations and settings, such as Cascade, Split-Range, Feedback, Feedforward, and more
- Study controller tuning, such as gain, integral time, derivative time, ramping, filtering, and gain scheduling
- Auto-tune controllers
- Design and evaluate surge control for compressor trains.

An example of a full dynamic gas plant model in VMGSim connected to a virtual DeltaV control system.
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