

## Supplemental Hydrogen Compression

Nexus works effectively with refinery team by providing temporary compression solution to capture lost margin



*Temporary Hydrogen Compressor System*

An unplanned refinery unit outage resulted in a nine to twelve-month loss of hydrogen compression capacity. While co-product hydrogen supply from another refinery unit remained available, the hydrogen compression outage led to a reduction in hydro-processing throughput, degradation of hydrogen to fuel and significant loss of product margin.

### challenge

The challenge was to safely, effectively and quickly capture lost hydroprocessing product margins in a nine to twelve-month time frame by providing additional hydrogen compression capacity.

Procurement of a new hydrogen compressor for temporary use was not practical due to cost and delivery schedule. Re-routing of the co-product hydrogen to a nearby third party hydrogen supplier for compression was not feasible due to significant variances in its composition from the third-party supply.

### solution

Our team worked quickly to locate a potentially suitable rental skid-mounted hydrogen compressor and driver including electrical supply connections and compressor controls. However, the compressor's natural gas engine driver and electrical equipment design posed significant risk management and operability challenges to the client. To support the risk mitigation effort, Nexus prepared an analysis of existing area classification maps, piping and utility systems to find a suitable location for the compressor skid based on API 500 recommended practices. In addition, Nexus worked with the equipment vendor to identify practical modifications to meet area classification electrical requirements (Class 1, Div. II, groups B, C, & D). Additional safety systems were added allowing the design and installation to meet client (PSM) requirements.

### results

The engineering and installation of the rental compressor was completed in 10 weeks. Stringent client PSM and operability requirements were met. Hydroprocessing unit throughput was increased by 10,000 barrels per day capturing potentially lost margins.

### industry

Oil & Gas Refining

### location

USA

### services provided

- Mechanical Engineering
- Piping Design
- Electrical Engineering
- Procurement
- PSM and risk mitigation support

### results

- Improved refinery profitability