Greenfield Control Panels
Case Study

Controlling 265,000 HP Requires Thousands of Miles of Wire

SITUATION

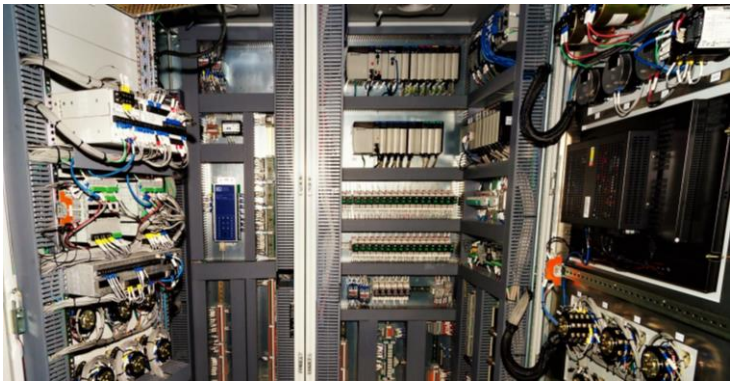
On June 13, 2016 a Texas pipeline company was awarded a 168-mile intrastate gas pipeline project by the Comisión Federal de Electricidad (CFE) – Mexico's state-owned utility serving 37 million customers – to provide natural gas transportation services beginning in 2018 to meet Mexico's growing electric generation needs.

The planned facilities include: 168 miles of intrastate pipeline, a compressor station located near Agua Dulce, TX with a total of 168,980 HP and a compressor station located near Brownsville, TX with a total horsepower of 96,560 HP.

That's over a quarter million HP that needs to managed and controlled. TTS was awarded the building and commissioning of the pipeline station control panels (SCP) and Emergency Shutdown Panels (ESD) for both facilities.

PROJECT SCOPE

Network Topology... The SCPs and ESDs will utilize the Ethernet based Device Level Ring architecture for processor I/O connections. This architecture, a combination of copper and fiber, is based on the 'Conceptual EtherNet Arch_RA' document provided by Spectra Energy. Each panel will have two (2) 1783-ETAP1F embedded switches for the Device Level Ring (DLR) over fiber between the panels. The SCP master panel will have two (2) Stratix 5700 managed Ethernet switches. 1756-EN2TR modules are dedicated to the DLR network. 1756-EN2T modules are for the HMI EtherNet/IP network.



Power Supplies... Power supplies will be configured in a N+1 configuration utilizing a redundancy module on the output the power supplies. The first redundant power supply

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Fed from the 120VAC utility power and the second will be fed from the UPS 120VAC panel. Each power supply will be sized to operate on its' own with a 30% margin for panel 24VDC devices and field I/O.

Inputs and Outputs (I/O)... I/O modules have been allocated to provide at least 20% spare. Each digital output will be wired to a 24VDC interposing relays. Each digital input will be wired to a 3-level terminal block with fuse and ground terminal. Each analog input card will be wired for single-ended current input and each input will be wired to a 3-level terminal block with fuse and ground terminal. Each analog output card will be wired for current output and be wired to a 3-level terminal block with a ground terminal. Wiring from I/O card fronts will utilize Allen-Bradley factory cables with pre-wired card fronts.

Enclosures... Control panels for the SCP and ESP panels will be per Table 2.1.4. NEMA Type 12 enclosures are to be top entry. NEMA Type 4X enclosures are to be bottom entry.

Chassis Configuration... Each chassis has been sized for at least 10% spare card allocation.

Software... TTS will provide programming based on Spectra provided documentation, such as P&ID diagrams, cause and effect matrixes, system descriptions, and control philosophies. Software version of Studio5000 to be specified by Spectra Energy but must be compatible with ControlLogix redundancy firmware. Software program will be open and editable by the pipeline company after commissioning is complete. TTS will provide one (1) copy of Logix Designer software, 9324-RLD700NXENM, the professional edition of Studio5000. This software is to be registered to the pipeline company.

SUMMARY

"The project is coming together very well. It won't be long till we'll be pushing gas into Mexico. Ontime execution makes money."
Plant Manager.