



Greenfield Control Panels

Case Study



Controlling Over 265,000 HP

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 needed to be managed and controlled. TTS was awarded the building and commissioning of the pipeline station control panels

PROJECT SCOPE

Network Topology... The SCPs and ESDs utilized the Ethernet-based Device Level Ring architecture for the processor I/O connections. This architecture, a combination of copper and fiber, is based on the Converged Plantwide Ethernet



(CPwE) with Device Level Ring (DLR) architecture specified by Rockwell Automation. Each panel has two (2) 1783-ETAP1F embedded switches for the Device Level Ring (DLR) over fiber between the panels. The SCP master panel has 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 were configured in an N+1 configuration utilizing a redundancy module on the output of the power supplies. The first redundant power supply fed from the 120VAC utility power and power supply

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fed from the 120VAC utility power and the second is fed from the UPS-supplied 120VAC inverter panel. Each power supply is 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 were allocated to provide at least 20% spare. Each digital output was wired to a 24VDC interposing relay. Each digital input was wired to a 3-level terminal block with fuse and ground terminal. Each analog input card was wired for single-ended current input, and each input wired to a 3-level terminal block with fuse and ground terminal. Each analog output card was wired for current output and a 3-level terminal block with a ground terminal. Wiring from I/O cards utilizes Allen-Bradley factory cables with pre-wired card fronts.

Enclosures... Control panels for the SCP and ESP panels are NEMA Type 12 enclosures with top entry. Outdoor remote I/O panels were specified as NEMA type 4X and configured for bottom entry.

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

Software... TTS provided programming based on the provided documentation, such as P&ID diagrams, cause and effect matrixes, system descriptions, and control philosophies. The software version of Studio5000 was specified by the operator and compatible with ControlLogix redundancy firmware. The software program is open and editable by the pipeline company. TTS provided one (1) copy of Logix Designer software, 9324-RLD700NXENM (Studio5000 Professional). This software was registered to the pipeline company.

SUMMARY

"The project came together very well. It won't be long till we'll be pushing lots of gas into Mexico. Ontime execution by TTS makes money for us."
Plant Manager.

