PROJECT OVERVIEW #118

altronic

Tesoro Golden Eagle Refinery

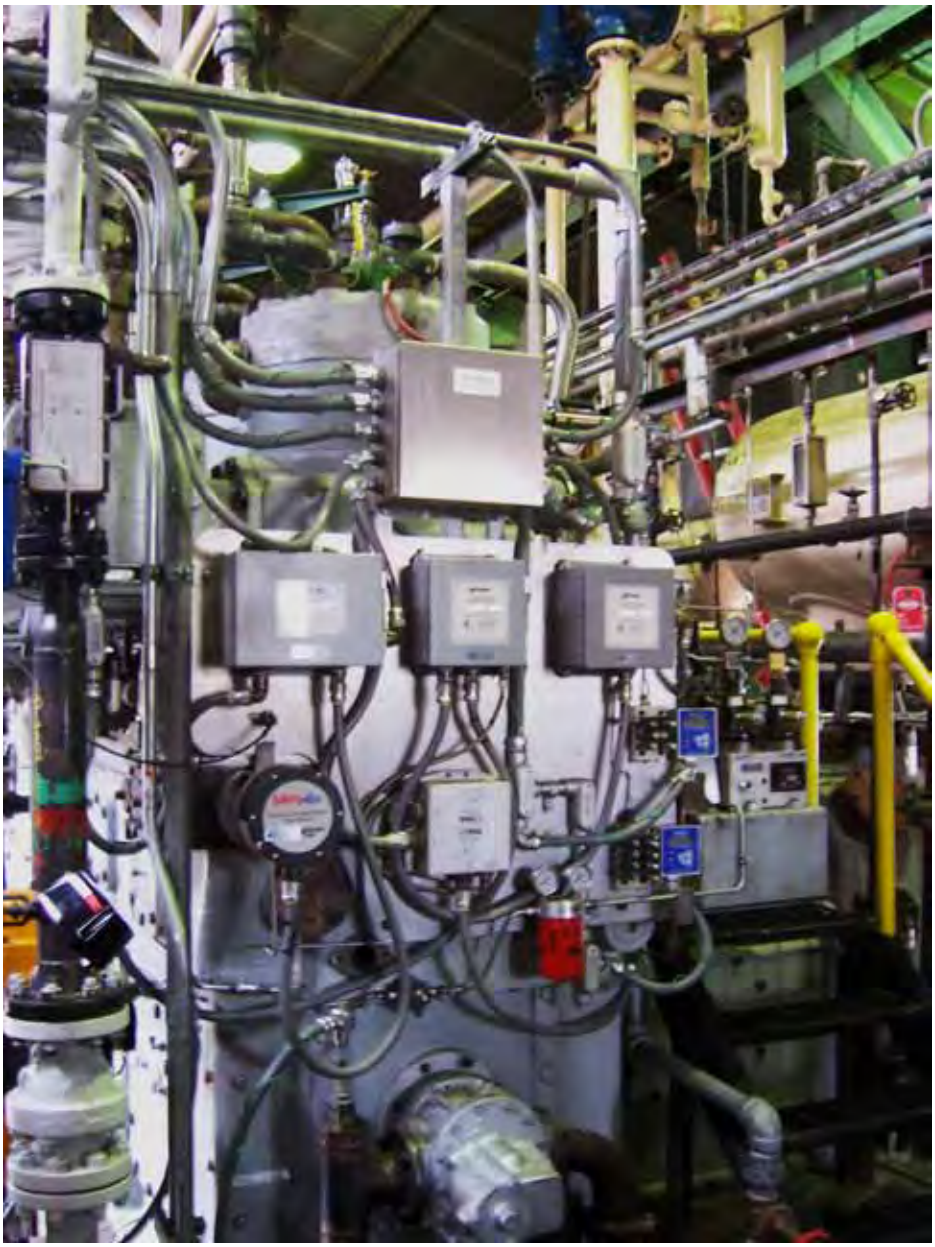
LOCATION:
Martinez, CA

APPLICATION:
Gas Compression

ENGINE/COMPRESSOR:
CLARK HRA8

DISTRIBUTOR/REP:
Coastal Ignition & Controls (CIC)
Scott Robinson

ALTRONIC PRODUCTS:
DE-3000 Safety Shutdown
CPU-2000 Digital Ignition
EZRail Modular Rail System
GOV-10 Gas Engine Governor
SaveAir System



OVERVIEW:
In early 2009, CIC significantly upgraded the control and safety shutdown system on the #5 wet gas compressor engine at the Tesoro Golden Eagle Refinery in Martinez, CA.

Prior to the upgrade, the CLARK HRA8 engine had no means of enacting a shut down—emergency or otherwise—other than an operator manually closing the fuel valve or shutting down the CPU-2000 ignition system. There was no automated fuel valve, so the engine would continue to run as long as it did not overspeed or have some sort of ignition shutdown. In 2006 the engine had a compressor-side failure that cracked the block. There was no operator to

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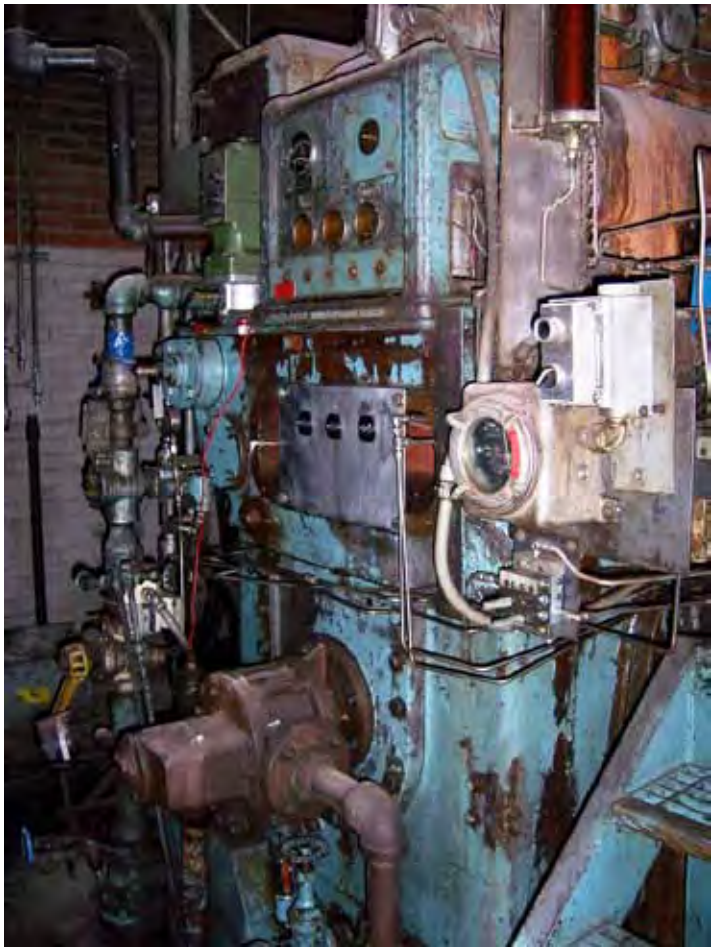
shut the engine down, and no ignition failure or overspeed, so the engine ran until it shook itself to pieces. Tesoro spent more $2 million to repair it.

In 2008 Tesoro reliability engineers asked Coastal Ignition & Controls to completely update the engine control system, fuel system, ignition system, lube system, Metrix vibration monitoring system, Woodward governor, outdated mechanical air start system, ignition harness, etc. CIC installed an Altronic Controls panel consisting of many Altronic devices: DE-3000 Safety Shutdown System, CPU-2000 with Diagnostic Module, EZRail, GOV10 Gas Engine Governor, and a SaveAir System. Also installed were Metrix Impact transducers (with relay voting system handled by the DE-3000) and a CCT lubrication system. Tesoro also installed an automated diaphragm-operated fuel valve controlled by the DE-3000. The engine has been running almost continuously since Tesoro completed a major update of the compressor-side piping system and corrected a timing issue caused during engine rebuild. The engine now runs significantly better, is much more reliable, starts instantly and consistently, and uses less fuel.

The operators love the new starting system because they do not have to manually bar the engine over to start it. The old Clark mechanical starting system had many dead spots and was prone to rusting, air leakage into the power cylinders and air injection valve burn-through. The new SaveAir system eliminates all of these problems and has a thermocouple at each air injection valve to detect any issues with the in-head air valves.

Tesoro operates five other Clark engines that have not yet been upgraded by Coastal and Altronic. Typically, it takes a crew of operators and mechanics an entire day or more to start these engines.



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