

# CUSTOM TAILORED COUPLING GUARDS

By Tony Rubino

A Midwest refiner recently performed coupling replacement on their FCCU power recovery train. The machinery in the train includes four bodies: a GE steam turbine, an IR4013 axial compressor, a Westinghouse induction motor-generator, and an IR E-148 expander. The new Goodrich diaphragm couplings have substantially larger hub flange diameters requiring new coupling guards to suit. RMS was selected to provide the new guards complete per API and the end user's own engineering standards.

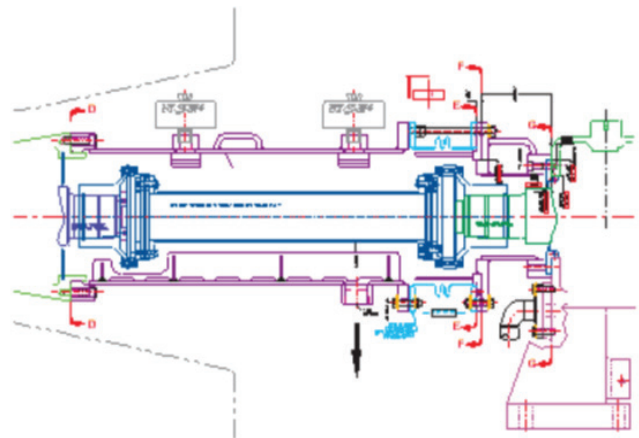


RMS inspected the existing coupling guards while the train was operating to create a baseline layout of the train including bearing housing interface flanges, lube oil supply piping and lube oil drain piping. The RMS inspection data were supplemented by end user provided photographs, instruction book drawings, and coupling drawings provided by Goodrich. The guards were designed using RMS design practices to ensure adequate ventilation to prevent excessive windage and heat generation. The manufacturing and assembly drawings were then developed from the layout. An additional benefit of the layout process was that a coupling interference and lack of a baffle plate were discovered. Since the compressor shaft ends are recessed into the casings, it was not possible to install one of the couplings with the compressor casings fully assembled. If an emergency coupling change were required in the future, either the compressor casing would have to be split or either the compressor or motor would have to be moved to facilitate installation

of the coupling. This was unacceptable to the end user which necessitate a coupling redesign. Due to RMS' discovery, the coupling change was completed well in advance of the turnaround. RMS was also able to incorporate a baffle plate in one of the guard adapter to minimize the windage and oil misting in the plain end compressor bearing housing.

The end user opted to include several product upgrades. Stainless steel bellows type expansion joints were used to provide positive sealing and prevent the oil leakage sometimes found with the o-ring type seal. All connections were integrally flanged per the end user's specifications. Coalescing demisters were also provided along with tubing that routed the coalesced oil back to the guard drain lines. Besides the design and manufacturing of the guards, RMS supplied all fasteners and necessary drawings for a total solution.

The guards were installed in September and are operating very satisfactorily per design intent.



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