GRAPHALLOY®: Success In Refinery Boiler Feedwater Pumps

GRAPHALLOY has many years of success in boiler feedwater pump applications. The non-galling, self-lubricating features of GRAPHALLOY allows pumps to continue working even when they encounter a run dry situation.

A Texas refinery has four Ingersoll Rand 6-stage CNTA radial split horizontal pumps in their boiler section. The operating units that use this boiler section have a lot of steam turbine driven equipment.

Demand Changes...Can Cause Seizing
Problems occur when the amount of steam needed changes and the rate is quickly increased or decreased. The demand on the steam turbines causes the boiler feed pumps to operate anywhere from shutoff to maximum flow. As the demand for steam increases or decreases, a signal is sent to one of the stand-by pumps to start up or, for an operating pump, to shut down. When this happens, it sometimes starves the operating pump, causing it to momentarily run dry.

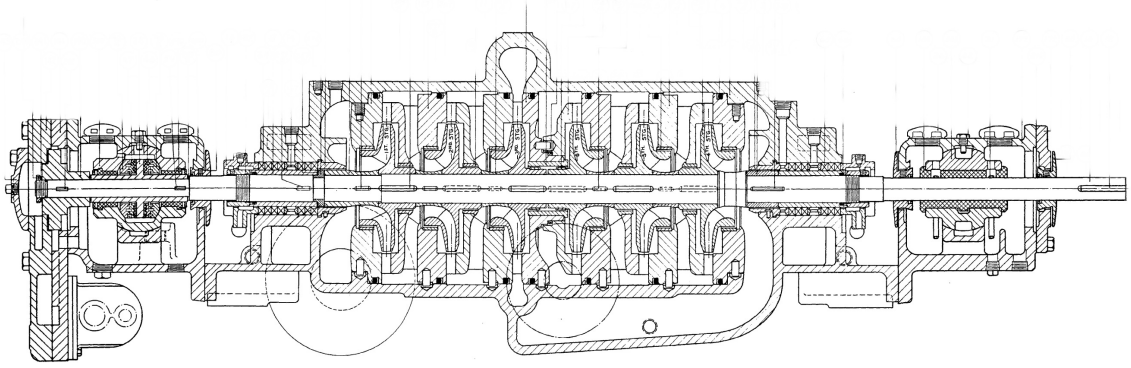
When a pump runs dry, metal to metal contact occurs between the rotating and stationary wear surfaces. The wear rings can weld to the shaft, damaging both the rings and shaft. In some cases, the entire pump needs to be overhauled at a substantial cost. Until the failed pump is replaced by a spare, the capacity of the operating unit is reduced, potentially resulting in lost revenues.

The GRAPHALLOY® Solution
The refinery installed nickel-grade GRAPHALLOY stationary Wear Rings, Throat Bushings, Throttle Bushings, Channel Ring Bushings and Crossover Center-Stage Bushings in one pump. The second pump was converted to GRAPHALLOY a month later. Both converted pumps survived an ensuing dry run that caused the third, metal-fitted, pump to fail. The third and fourth pumps were then converted to GRAPHALLOY. (A cross-section of this pump is attached.)

Results
The non-galling characteristics of GRAPHALLOY allow the pumps to operate safely at unstable flow rates.

After the first year of service following the GRAPHALLOY upgrade, the pumps were operating above the performance curve in both capacity and developed head. In addition, vibration levels were well below the alarm set level.

Split Horizontal Pump



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