

Surface Pumping System Replaces Maintenance Intensive PD Pumps in Texas Gas Plant

REAL PROBLEMS

Liquid amine, a derivative of ammonia, is used in gas sweetening processes. Acidic gases, through a chemical reaction, are absorbed and pumped through a series of exchangers, towers and contactors. The amine solution must be carried throughout the system at certain pressures in order for the gas sweetening process to take place. Once the process has occurred, the amine solution is reclaimed and recycled. This operator, like many others, has historically used small positive-displacement (PD), duplex/triplex, plunger pumps to move the liquid and to maintain pressures in gas plant amine applications. The operator found PD pumps costly to operate and maintain.

- The PD pumps consistently leaked expensive amine. (In addition to the product loss, this caused environmental problems that required costly remediation)
- The PD pumps required constant modification to meet changing plant and process conditions
- Vibration inherent in the PD pumps was causing piping fatigue
- Maintenance of the PD pumps was running between \$500 and \$1500/month and required excessive attention from maintenance crews
- Extra capital was spent to install 100% backup in an attempt to eliminate plant downtime (installing spare pumps increased pump availability, but also increased maintenance expenses)

REAL SOLUTIONS

Wood Group ESP designed and engineered an economical Surface Pumping System (SPS™), the SP75 (rated for 20 to 75 HP), to replace the PD pumps. The SPS centrifugal pump features a single, mechanical-shaft seal that is only exposed to suction pressure.

- The new SP75 provided comparable efficiency and the same dependability of Wood Group ESP's larger SP1000 (rated for 100 to 1000 HP)
- To assure materials compatibility for the amine application, special elastomers and stainless steel hardware were employed on the mechanical shaft seal
- The pump shaft was manufactured with a Nitronic material to avoid leaching of copper used in standard pump shaft material

REAL RESULTS

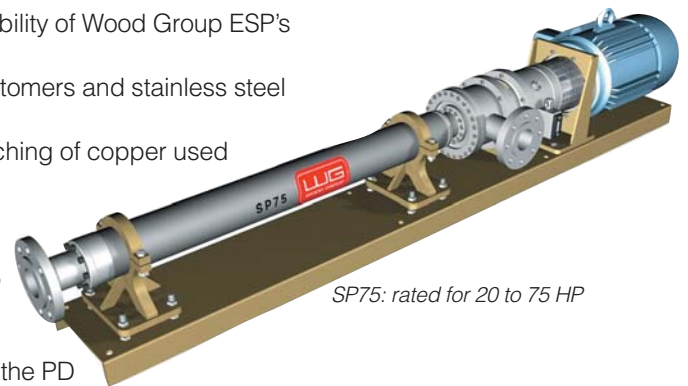
The new SP75 was installed. At the end of the first five months of service, the operator noted the following:

- Initial operating cost savings were between \$1500 to \$2500/month
- Based on the routine maintenance costs and lost product inherent with the PD pumps, the purchase price of the SP75 has a pay out of less than one year
- Costly fluid losses were eliminated
- The SP75 centrifugal pump is extremely quiet, and operates with zero pulsation and minimal vibration (thus eliminating many of the problems associated with PD pumps, and their more complex pipework systems)
- Environmental emissions were virtually eliminated
- The operator's mechanics have been able to focus their time on other plant issues.

This operator is in the process of replacing small PD pumps in all its gas plants with the SP75 centrifugal pump. The operator is also considering replacing larger PD pumps with Wood Group ESP's SP1000 system.



*SP75 amine gas service application
Big Lake, Texas*



SP75: rated for 20 to 75 HP