

Sundyne HMD Kontro Sealless Pumps

HMD Kontro

Case Study

Sealless Costs Less for Petronas

Petronas upgrade plant to API 685 magnetic drive pumps, featuring latest technology

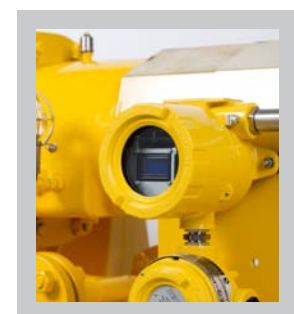
As part of a continual upgrade process and to ensure the highest level of health and safety, refining and petrochemical company, Petronas, has recently upgraded a number of existing pump installations to meet current American Petroleum Institute (API) standards. The existing single mechanical seal pumps operating on hydrocarbon processes were reviewed for suitability against either a double mechanical seal upgrade or an entire sealless pump replacement.

The specific Petronas plant involved is an experienced user of sealless pump technology with an installed base in excess of 50 magnetic drive sealless pumps. As a user of this technology for over 15 years, Petronas has enjoyed the benefits of magnetic drive pumps on various applications. These benefits are well known and include complete elimination of fugitive emissions, reduction of initial installation cost, reduced cost of ownership and full site serviceability. It was these reasons and the obvious health and safety benefits provided by a sealless pump that led to Petronas choosing API compliant magnetic drive sealless pumps to upgrade its existing installation.

A magnetic drive pump package containing six vertical inline pumps and two horizontal pumps were supplied in accordance to API 685 2nd Edition. This API standard, applicable to sealless centrifugal pumps for petroleum, petrochemical, and gas industry process service, is based on accumulated knowledge and experience from users, engineering companies and manufacturers of sealless pumps. Its intent is to facilitate the manufacture and procurement process of sealless pumps and it provides the reader with minimum design requirements, safety features and application guidance needed to successfully use sealless technology.

The pump applications that were to be upgraded included Debutanizer Reflux, Reformer Stabilizer Reflux and Pre-treater Stripper Reflux duties. The liquids included mixed LPG and hydrocarbons. These liquids typically feature low viscosities, low densities and are of a volatile nature, making them ideal candidates for properly applied magnetic drive pump technology. Some of the liquids also had the presence of H₂S, thus wetted components of the pumps needed to feature materials that comply with NACE requirements for sour service.

During the process of evaluation for the upgrade, the latest magnetic drive pump technologies and designs were reviewed ensuring the eventual solution reflected latest technological advancements available to magnetic drive sealless pumps. Such technologies and designs include condition monitoring of the pumps internal flow regime, high efficiency composite containment shells and vertical inline pump design. It was these features that helped Petronas choose magnetic drive pumps for its upgrade project.





Condition monitoring of the internal flow regime (VapourView):

This instrument utilises non-intrusive ultrasonic technology to constantly monitor the condition of the fluid inside the pump. The device detects the early presence of gas in the internal cooling and lubrication circuit from outside the confines of the pump pressure boundary and provides an early warning of adverse conditions that are likely to impact the internal bearing lubrication and the cooling of the magnetic coupling. One of the key features of this device is that it is measuring and reacting to the primary cause of potential problem and not the secondary which is the case when monitoring power or temperature. Some of the benefits of this system are that it provides real time condition monitoring of the internal fluid, detects the early presence of gas, ensures correct priming and venting and eliminates the potential for dry running. The instrument features a 4-20 mA output signal, on board data logging via microSD card, local visual indicators and IECEx / ATEX compliancy. It can also be retro-fitted to many existing magnetic drive pump installations, providing increased peace of mind to existing users.

High efficiency, engineered composite containment shells (ZeroLoss):

These containment shells feature a non-magnetic material that virtually eliminates all the induction losses (eddy current losses) associated with metallic containment shells. By eliminating the induction losses, several benefits are experienced including significantly reduced heating of the pumped product that is circulated to lubricate the internal bearings of the magnetic drive pump, improved handling of volatile and heat sensitive liquids and an improvement in overall pump efficiency when compared to a similar sized pump featuring a metallic containment shell. A further and often overlooked benefit is that it also provides a more robust design for magnetic drive pump installations that might experience system upset conditions. It is these features that make these containment shells ideal for use on hydrocarbon installations. The containment shells are produced to comply with the 40 bar (580 psi) API 685 design pressure requirements and feature a highly chemical resistant composite material that is tough, durable and robust.

API Compliant Vertical Inline Magnetic Drive Pumps (GSPV Pump Range):

This range of pumps has all the features of a horizontal magnetic drive sealless pump. This includes the benefits of a vertical inline configuration such as minimal footprint and minimal requirements for piping modifications when upgrading from other inline designs. The hydraulic designs of this range feature radial diffusers, ensuring hydraulic optimisation, and dimensionally the range complies with the requirements of BS4082. The design pressure of the range is 40 Bar (580 psi) and is suitable for operating temperatures up to 205°C. A wide variety of material options are available including Stainless Steel (A8), Carbon Steel (S5) and Duplex Stainless Steels (D1 and D2).

Finally, another benefit when choosing magnetic drive pump technology is one of a commercial nature. Because a sealless pump installation does not require all the ancillaries and support systems typically associated with a pressurised double mechanical seal installation (particularly if the seal installation is to API standards), an entire sealless pump solutions is often more economical.

When the pump package that featured the above technologies and design features were compared to the double mechanical seal upgrade route, it was found to be more cost effective as well as providing the already mentioned benefits associated with magnetic drive sealless pumps. This, added to the dedicated service and support provided by HMD's local representative, Sanggul Emas, enabled Petronas to make a decision based on commercial and technical compliance.

For further information on Sundyne HMD Kontro sealless pumps for use in arduous API and other applications, please contact us on +44 1323 452000 or by email to info@hmdpumps.com. Alternatively, please see our website at www.hmdkontro.com