Concepts for Efficient Maintenance of Progressive Cavity Pumps

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Introduction

In process industry plant downtimes are often critical and state a major cost factor across all industries and processes. Around five percent of the whole production capacity remains unused due to unexpected down times, up to 40 % and more of this loss of production is induced by outage of field devices.

Pumps are the central component, the driving force, in any process plant. But still, while online diagnostics is state-of-the-art for sensors and actuators, pumps mostly remain unmonitored.

Today, common practice to avoid unplanned plant downtimes, preventive maintenance is applied. That means that maintenance work is scheduled during planned shutdowns. This reduces or even avoids downtimes due to asset failure, but increases primary maintenance cost.

Predictive maintenance is a strategy for optimizing downtimes *and* cost for wear parts and labor. Additional information already available in the process and historic data is evaluated in order to draw conclusions on the health of a certain asset and thereby predict the point in time when maintenance work is required The work can then be planned optimally.

Another cost driver is plant asset and supply chain management including warehousing, procurement, and field device service – all this in conjunction with maintenance cycles of the plant itself.

In this presentation we give an outlook on future plant asset and service management, novel order processes and concepts on predictive maintenance for progressive cavity pumps. The concept incorporates several departments of within the users' organization and fosters collaboration – horizontally and vertically within the value-added chain.

Maintenance Support

As a matter of principle, pumps are subject to wear out. Depending on the process conditions, wear parts need to be exchanged regularly. For progressive cavity pumps this is a rather elaborate process which requires technical expertise. With rising complexity and reduced personnel, knowledge and experience on each of the assets is reduced over time. Thus, support from the supplier is claimed. Recent technology

evolution allows for deployment of virtual or even augmented reality for assisted maintenance. For instance, SEEPEX VR is an app available for Android and iOS devices which supports the end-user during rotor or stator exchange with animations showing each disassembly and assembly step in detail in a virtual or an augmented reality environment. This enables even an unexperienced technician to do the maintenance work. Especially in unfavorable times or in critical situations – typically over night or at the weekends – where the experts are not available, this support is of highest value.

Service Support

The need for regular exchange of wear parts requires either warehousing of spare parts or a short delivery chain. Typically, there are various departments on end-user's as well as on supplier's side involved in the chain. SEEPEX Service Point stream lines the spare parts order process. It offers a convenient way to initiate the ordering of the required spares: If the QR code on the pump's type plate is being scanned using an arbitrary QR code scanner on any mobile device, all pump-specific data is available in the app. Additionally, the user can directly request a quotation for spare part packages for that particular unit. By this, vertical barriers within his organization are overcome while still maintaining the competences resulting in a much faster and more reliable order process.

Pump management

The bigger a plant is, the more assets need to be managed. Historic activities on the pump need to be tracked. As of today this is typically carried out on a notebook. The digital change currently also reaching the process industry demands for digital data acquisition. A pump management app could support this. A pump can be added to the plant topology by scanning the QR code and is automatically enriched by its properties. All activities – change of operations parameters, works carried out on the device et cetera, are captured in the app. It is even conceivable that predictive algorithms trigger spare parts order and support planning of maintenance work.

Conclusion

The currently ongoing digital change in process industry offers unprecedented opportunities for optimizing operation and maintenance of assets such as progressive cavity pumps. We outlined the potential of currently available solutions

and showed a way how they could evolve in future to further support the users and operators in convenient, reliable and efficient plant operation.