

Intensive global competition and sustained cost pressure have highlighted the importance of asset management in many industries. Concentration on "Return on Assets" has become a key issue in the process industry. What is the actual, tangible contribution of plant asset management?

Asset management in the process industry

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For many years, companies have taken a holistic approach in an attempt to drive down initial investment costs as well as total operational life cycle costs. However, producers now have access to state-of-the-art techniques such as condition monitoring which enables plant personnel to use design data when they monitor the status of field devices and system components.

At the present time, there are three main approaches to asset management. The first is the familiar trained eyes and ears of the "maintenance man", who has a wealth of production skills and experience. These old hands can detect changes in machine operating noise and pass this information on to specialists who use experience-based data to make operational recommendations. The time lapse between detection of a malfunction and corrective action is very short, and solutions are normally very pragmatic. Inspection data provided by offline checks, which may be made at regular intervals to detect deviation, is somewhat more reliable. Monthly vibration checks are an example of this approach. Online monitoring, which is the third variation, supplies both the momentary value and the underlying trend. All of

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these three approaches have a crucial flaw: they ignore the influence of the major factor which influences the remaining lifespan of the equipment, namely the process conditions.

Actual process conditions are the crucial factor

We know from studies conducted over the course of many years in the process industry that process conditions are the crucial factor which determines equipment wear-out rates. This is the reason why the traditional reliance on equipment-related statistical comparisons has seldom produced useful results. The crucial question is: what is the remaining lifespan in a specific process when the equipment continues to operate in the same mode, and can any recommendation be made which would help reduce or delay progressive wear. This information can make a major contribution towards increasing the availability of process equipment and improving the utilization ratio of a production line. Maintenance activity can be scheduled for times when production activity is low, or it can be avoided altogether. When these factors are entered into the equation, the maintenance team becomes an asset manager entity which assumes responsibility for optimizing maintenance activity and system utilization.

Unfortunately, we do not currently have industrial-grade, cost-effective systems which can produce remaining life predictions for specific processes and equipment based on physical measurements and experience-based values. Equipment manufacturers, process control system suppliers and users all need to make a concerted (and if possible coordinated) effort to take on

A lot of new production systems are being installed in China, and this makes it easier to deploy asset management systems right from the start. Evening view of the Bayer Integrated Site Shanghai (BISS). Pictured here is the facility for the production of polycarbonate.



Picture: Bayer

this challenge. One new approach combines asset management with process control in order to increase machine availability. The process is managed to ensure cost-effective operation. Performance monitoring supplies timely information on items such as quality and energy consumption in a chemical process. This allows plant operators to take timely corrective action and keep the process close to the ideal parameters.

Process control and performance monitoring provide feedback on individual assets in the specific process environment. Only mission-critical assets are monitored. The focus is on operability compared to the specified condition of the components in the ongoing process rather than on operability compared to design specifications. Typical items of interest include the level of clogging on mixers, heat exchangers or filters and the useful life of catalysts. Up until this point, asset monitoring has been an insular solution which focuses on the particular process in a running system. The focus of asset monitoring is shifting from maintenance cost reduction to increased system availability and a reduction in production costs.

Examples from actual production environments show that asset monitoring is well worth the effort if the application is well thought out and the right sensors are available. The use of asset monitoring during the planning phase can help avoid the deployment of redundant equipment. Monitoring can eliminate the need for redundancy. Engineers can choose the best sensors which are easy and inexpensive to install at this stage but are often too expensive to install as a retrofit.

It is conceivable that in the future we may see widespread use of standardized monitoring blocks which are developed for individual machines

and are then adapted to specific process conditions. Standardization may provide a cost-effective solution for many pieces of equipment which are currently not monitored because dedicated solutions are too expensive. In the long term, asset monitoring and performance monitoring may take on equal importance as production and maintenance applications.

Strong demand for asset management on new equipment in China

As mentioned above, asset monitoring is primarily used on new equipment projects. John Berra (President of Emerson Process Management) made the following observation at the press conference which was held in conjunction with the NAMUR annual meeting last year: "Firstly, a lot of new production systems are being installed in China, and this makes it easier to deploy asset management systems right from the start. Secondly, operators in China do not merely want to operate a plant. They want the best plant in the world, and asset management can take them where they want to go." The NAMUR Executive Committee confirms that operators of existing equipment which is located primarily in Europe and the US are slow to embrace asset management systems.

Why is asset management such a crucial competitive factor? If you look at the production factors and cost in particular, it appears to make sense to use automation systems not only to manage the process but also to optimize asset utilization. Automation equipment can help reduce investment and maintenance costs, maximize asset efficiency and achieve integrated equipment optimization in order to drive down production costs. ■