Asset Performance Management

Overview

Many oil and gas operators around the world are becoming increasingly interested in Asset Performance Management (APM). APM success necessitates a smooth flow of data through all activities that affect asset efficiency. For several years, businesses have operated in silos, with divisions operating entirely separately. The flow of data and information was inefficient as a result. Usually, the same data is fed into different systems without being fully realized. Information, known as post-processed data that results in useful information, is only routed through specific departments, limiting its potential value.

Introduction

APM is a collection of technical solutions aimed at improving the reliability and availability of physical assets critical to a company's operations. The definition of APM is historically associated with manufacturing and Industry 4.0, but it can easily be applied to service companies as well, especially in sectors where asset availability and efficiency have a direct impact on service provision and operation results, such as distribution (hypermarkets), catering, or electricity (such as service stations).

Asset performance management (APM) systems increase the availability and reliability of physical assets while lowering risk and operational costs. Condition tracking, predictive maintenance, asset integrity management, and reliability-centered maintenance are all examples of APM, and tools like asset health data collection, visualization, and analytics are often used.

To provide a holistic view of output, asset efficiency, and product quality, Asset Performance Management entails information sharing and application integration among operations and maintenance. APM strengthens the integration of production management (creating the product) and asset management (managing the assets) (ensuring the capability to produce). Goals and goals are communicated and shared more explicitly. Business processes, infrastructure, and organizational structure are all affected by APM.

Asset Performance Management (APM)
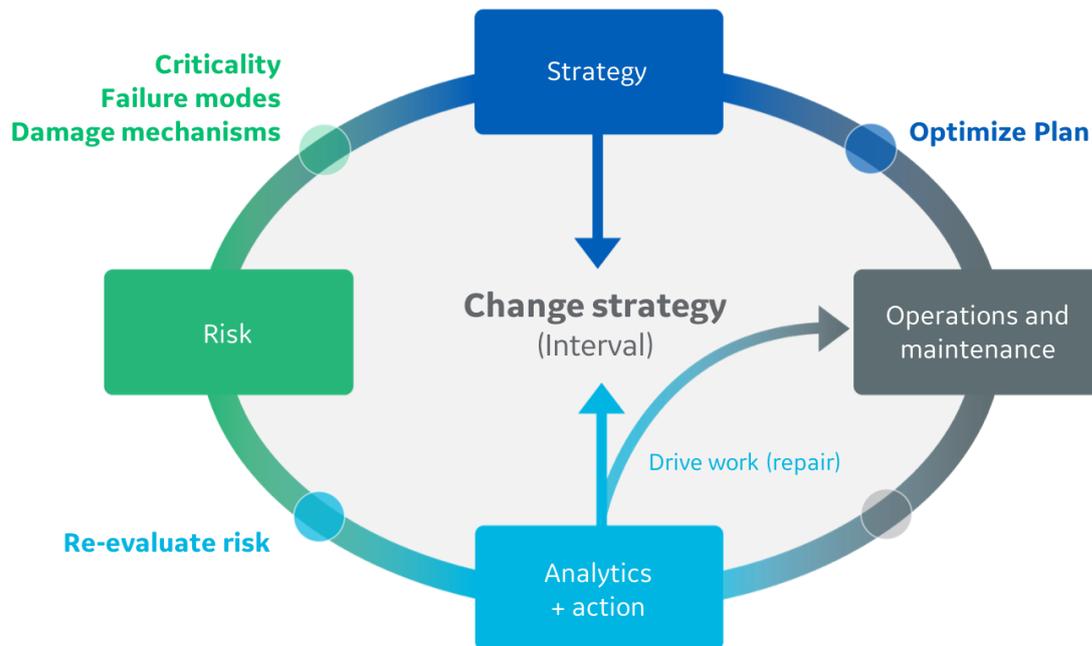
APM Review

Asset performance management (APM) is a paradigm that encompasses the next generation of approaches for ensuring optimal performance through the asset lifecycle. Arrelic is redefining asset performance management by adopting a risk-based, holistic approach to design and operations. This entails integrating well established approaches into both short- and long-term decision-making processes, leveraging market experience and standards. Asset performance management at Arrelic entails the application of data collection, integration, visualization, and analytics with the explicit goal of enhancing the operational performance of physical assets. Condition tracking, predictive forecasting, and reliability centered maintenance (RCM), risk-based inspection (RBI), quantitative risk assessment (QRA), safety integrity level (SIL), and integrity operating window are all concepts covered by APM (IOW).

APM Model with KPIs

To provide a holistic view of production and asset performance, Asset Performance Management synchronizes production and maintenance with information sharing and application integration among enterprise asset management, manufacturing execution systems/manufacturing operations management, plant asset management, asset integrity management (inspections), and other solutions. For better efficiency, reliability, protection, quality, and return on assets, this integration improves cross-functional visibility, collaboration, and communication.

Industrial IoT (IIoT) and Industries 4.0, in particular for APM, provide new ways to boost overall business results. This involves operational improvements for owner-operators, primarily through increased asset reliability in process industries and higher efficiency in discrete industries. IIoT provides additional revenue streams for original equipment manufacturers (OEMs) by expanding their business model into aftermarket services for increased efficiency and quality. This combines IIoT, analytics, and other predictive and prescriptive technology for both end users and suppliers to improve performance.

APM-based optimization covers functional silos such as operations, maintenance, and quality control, as well as within silos, where major inefficiency, waste, and even dysfunction often exist. This APM approach allows you to improve key metrics like uptime, mean time to repair (MTTR), asset durability, cost, quality/yield, and safety in a systematic way. Improvements in executive metrics such as sales, margin, customer satisfaction, and work-in-process (WIP) inventory result from success with these metrics.

Asset performance management (APM) is a tried-and-true method for reducing unplanned downtime, lowering maintenance costs, and lowering EH&S risks. Installing a collection of sensors or point solutions to control and track your systems and properties isn't enough to implement an effective APM strategy. Asset Performance Management (APM) is an integrated, connected enterprise solution that enables asset-intensive organizations to run safer, more efficient operations while promoting optimum performance at a lower, long-term cost.

APM Principles

To provide a full picture of output, asset efficiency, and product quality, asset performance management entails the sharing of knowledge and application integration between operations and maintenance. APM ensures production or service delivery capability by improving the integration of operations and asset management.

To provide a full image of production and asset performance, asset performance management synchronizes production and maintenance with information sharing and application integration between enterprise asset management, operations management systems, asset management, inspections, and other solutions. This integration improves efficiency, reliability, protection, quality, and asset performance by increasing visibility, collaboration, and communication across functions.

APM refers to an organization's maintenance operations achieving the highest degree of maturity, which includes everything from conventional reactive and preventive maintenance to predictive maintenance and eventually risk-based maintenance management.

APM optimization encompasses a variety of functional fields, including processes, maintenance, and quality control. This APM approach allows you to improve key metrics like uptime, mean time to fix, asset life, cost, quality/performance, and safety in a systematic way. This enhancement has a direct effect on the company's performance, including sales and earnings, as well as customer satisfaction rates.

MAINTENANCE LEVELS

REACTIVE → PREVENTIVE → CONDITION-BASED → PREDICTIVE → RISK-BASED

STRATEGY
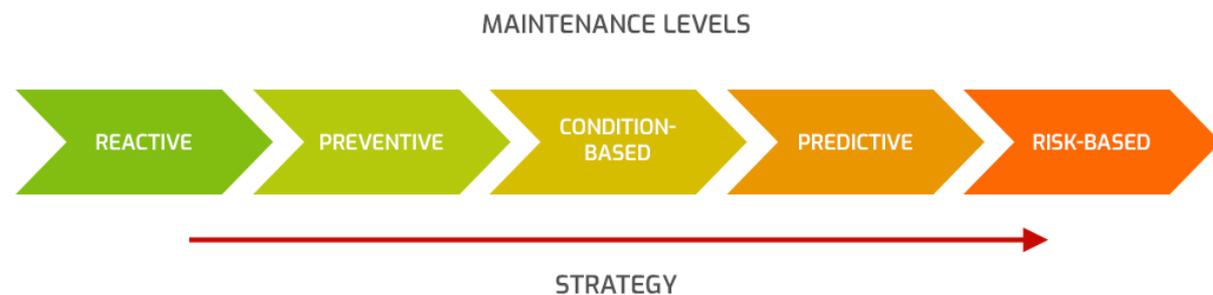
APM components

Effective analytical tools fed with data from integrated business processes are at the heart of APM performance management. It contextualizes data to produce actionable insights by looking for trends and opportunities for change through a variety of sources. APM makes asset-centric organizations more efficient by using data management, pattern analysis, predictive analytics, artificial intelligence, and machine learning to improve asset efficiency while lowering operating costs and risks.

However, as with other tools like strategic asset management (EAM), the approach is just as critical, if not more, than the technology in APM. People, procedures, and structures will all work together to achieve long-term organizational success with the

aid of a single plan. The cornerstone of effective asset management and performance management is the development of simple, automated, and organized processes.

Some main components in APM, based on this approach, are:

- A complete view of the state of the properties, combining IT information (information systems) with OT information (operational systems, such as sensors).

- Big Data and digital twin approaches, as well as advanced analytics.

- Legal and regulatory risk control, with resources that monitor the key factors that influence the risk associated with asset condition.

- The use of strategic enterprise asset management (Strategic EAM), such as Retain, to better incorporate all processes and activities related to the company's assets into an overall operational efficiency plan.

Intelligent Analytical Solutions in APM

- Risk-based inspection (RBI)
- Plant integrity management
- Reliability centered maintenance (RCM)
- Performance forecasting
- Safety integrity level (SIL)

Plant Integrity Management

Arrelic's asset performance management (APM) offering also includes Synergy Plant for plant integrity management. It empowers companies to capture, integrate and visualize data, which can be further integrated with analytical tools such as reliability-centered maintenance (RCM), risk-based inspection (RBI), performance forecasting

(RAM analysis) and safety integrity level (SIL) with the clear objective of improving the reliability and availability of assets.

RAM Analysis - Reliability, Availability and Maintainability

Reliability, Availability and Maintainability (RAM) analysis allows you to simulate the entire life time performance of an asset in terms of availability, production efficiency and profitability. By using this well-established analytical method, you are able to predict problems before they occur. RAM analysis is performed in design and operation, from upstream oil and gas extraction through processing and transport logistics to the delivery of refined products to the customer.

Conclusion

Asset management is critical to any organization's success, particularly because infrastructure assets with a long life cycle and a large capital outlay provide a base for economic activity. The more complicated the business, the more important it is to have a good asset management system in place.

Although manual asset management practices can get the job done, workers would have to manually wrinkle and hammer out a lot of information to ensure their company gets the best out of its properties. Businesses can easily control assets and execute asset management strategies by incorporating an asset management tool.