ASSET PERFORMANCE MANAGEMENT IN OIL & GAS

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INTRODUCTION

Asset Performance Management (APM) is a discipline that has been growing in interest by many oil and gas operators around the world. Successful APM requires efficient flow of data across all activities that impact asset performance. For many years companies have functioned with departments working completely independently, in silos. This created inefficiency in the flow of data and information. The same data are typically added to multiple systems without the realization of its extensive potential. Information, which is here defined as post-processed data resulting in useful knowledge, only flows through specific departments, reducing its potential value.

APM REVIEW

Asset performance management is a framework encompassing the next generation of methods used to ensure that performance is optimum throughout the entire asset lifecycle. Arrelic is redefining asset performance management toward an all-encompassing risk-based approach to design and operations. This means incorporating to the short and long-term decision-making process with well-established techniques taking advantage of industry knowledge and standards. At Arrelic, asset performance management encompasses the capabilities of data capture, integration, visualization and analytics tied together for the explicit purpose of improving the operational performance of physical assets. APM includes the concepts of condition monitoring, predictive forecasting and reliability-centred maintenance (RCM), risk-based inspection (RBI), quantitative risk assessment (QRA), safety integrity level (SIL), and integrity operating window (IOW).

APM IN DESIGN PHASE

The ability to influence cost becomes limited as the project evolves throughout the design phase, with design optimization. Thus, methodologies such as reliability, availability and maintainability analysis (RAM analysis) and operational forecasting are vital in the development of capital projects in the oil and gas industry. The earlier in the project the decision to change something is made, the more effective it will be from a cost perspective.

APM IN OPERATIONS AND MAINTENANCE PHASE

Risk-based methods such as risk-based inspection (RBI), safety integrity level (SIL), assessment and reliability-centered maintenance (RCM) can be used to rank system and equipment criticality and to develop strategies for maintenance and inspection to manage the risks. Taking the risk approach has significant impact in many areas, including cost, staff morale, maintenance resources allocation, control of maintenance budgets, efficiency and reduced production scrap, to mention just a few.

Companies with mature reliability and safety programs typically make use of quantitative and more advanced methods such as quantitative risk-based inspection or failure mode effect and criticality analysis.

EFFECTIVE INFORMATION MANAGEMENT WITH A DIGITAL TWIN

Poor information management is a hidden cost that can account for up to a fifth of operational budgets. The digital twin addresses this weakness. The digital twin is a digital, virtual representation of an asset, maintained throughout the lifecycle and easily accessible at any time. Central to this new concept is the creation of the digital asset ecosystem. The digital asset ecosystem is a network of interconnecting and interacting data, software and hardware relating to the asset and its system. One powerful aspect of this approach is enabling a new generation of advanced predictive analytics that are central to advancing asset performance management.

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 Synergi 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.

PROCESS HAZARD ANALYSIS

Materials such as oil and gas can present a significant hazard due in part to their high-energy content. Pharmaceuticals and petrochemicals may be flammable, explosive and toxic. To add to the risk, hazardous pressures and temperatures are often necessary to process these materials to create usable products. For these reasons the process industry is a source of major hazards to people, property and the environment. The global community of process safety professionals continuously strives to manage these hazards. Arrelic's hazard analysis tools contain world-leading, experimentally validated models for simulation of the behavior of loss of containment of hazardous materials

RISK ANALYSIS - QRA

Traditionally, the purpose of conducting a risk analysis has been to comply with regulatory requirements. This paradigm has evolved into risk-based design and risk-based operations. Quantification of risk forms a valuable basis on which to help determine where to focus avoidance, prevention and mitigation measures, given finite resources. Arrelic's risk analysis tools have been adopted globally in the oil and gas, petrochemicals, chemicals, pharmaceutical, insurance, steel and other industries for the purpose of understanding and therefore managing risk.

UPTO 25%

INCREASE IN EBITDA

UPTO 30%

DECREASE IN MANUFACTURING COST

ASSET PERFORMANCE MANAGEMENT REPORT

About Arrelic

Arrelic is a fast-growing deep-tech firm aiming to bring the next level of IoT based sensor technology to transform the mode of manufacturing operation and maintenance practice of various industries with extensive expertise in Reliability Engineering, Predictive Maintenance, Industrial Internet of Things (IIoT) Sensors, Machine Learning and Artificial Intelligence. We provide a single ecosystem for catering all industry needs from Consulting to IoT and Analytics as well as providing Training and Development courses for different stakeholders. We aim to help manufacturing industries to improve their overall plant productivity, reliability and minimize total production cost by 25-30% by eliminating machine downtime, lightening management decisions by analysing the machine data with right mind and expertise; for a worry free operation

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GOT ANY QUESTIONS?

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