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[INSIDE INDUSTRY]

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Risk-based asset integrity management

Within the area of management of process plant integrity, there has been a significant shift toward the adoption of risk-focused methods such as reliability-centered maintenance (RCM) and risk-based inspection (RBI), rather than following traditional preventative maintenance methods and prescriptive inspection intervals. There are various reasons for this trend, but the primary benefit that asset owners and operators have gained is tangible cost reduction (for both manpower and parts) and overall improved asset uptime. The effectiveness of RCM and RBI compared to preventative and prescriptive measures is evident upon critical review.

To successfully implement RCM or RBI, the operator/owner is forced to step back from the maintenance or inspection activity itself, initiating study processes that deliver higher levels of understanding — specifically in the area of plant performance. One of the main deliverables of such studies is actual statistical plant performance data. However, more importantly, the key factors and underlying risks that are likely to threaten the performance are recognized and understood. Although the RCM method makes reference to industry-derived breakdown/failure rates for equipment types, it is singularly specific in targeting greater knowledge for risks specific to the actual plant and equipment owned. The same outcome is true for setting the inspection activities through the RBI effort.

Risk-based inspection is a tool that enables a “smarter” application of inspection resources to those areas of a system where there is maximum benefit to be gained in terms of controlling exposure to risk. Under an RBI program, the frequency and type of inspections need to focus on those areas where the probability of failure and the consequences of failure are highest.

Risk can be weighted in favor of safety, economic or environmental risk depending on the nature of the system, or it can be a combination of all three. The exact weighting of these risk types will be determined and agreed to by the project team.

Through RBI (a subset activity of an integrity management system), the main drive is to drill into the many and complex mechanisms/modes of plant deterioration that can be evident within a plant or any

inspectable system, whether it be an offshore production facility's topsides, a floating production system structure, or a refinery or chemical processing plant. In tandem, the consequence of such failure and the likelihood of an event are determined, thus providing for a matrix of total risk for the specific item, system or facility. From this, survey and inspection programs are devised that focus the resources and activities utilized within an inspection program to be specifically geared toward finding problem areas/potential failure sites. The main point: Inspect in advance of an actual failure or significant reduction in integrity.

When dealing with equipment, this provides significant benefits in the areas of safety and commercial performance of the plant, allowing the plant operator the flexi-

A true risk-based asset integrity management system implementation must also target the company's management systems.

bility to also place further emphasis on the scheme by tailoring in some business criticality if desired.

In summary, a true risk-based asset integrity management system implementation encompasses not only the optimization of the hardware itself, but also targets the company's management systems. Asset integrity management can be viewed as a comprehensive strategy combining technical and managerial elements to ensure that the installation's uptime and profits are optimized through the implementation of methodologies that utilize technologies such as risk and reliability. ABS Consulting believes that risk and reliability analysis only has value if it is part of a decision-making process aimed at making facilities safer, environmentally compatible and operationally sound.

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