Saudi Aramco Gas Turbine - 40 Years Journey Of Optimization” to “Safe & Reliable Production Operations of Gas Compression Facilities Utilizing Gas Turbine Mechanical Drive

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Abstract

This paper will introduce the principles of excellence in plants maintenance and reliability by summarizing the philosophy and different types of maintenance activities. Real time industrial examples and common reliability troubleshooting issues for rotating equipment in oil & gas industry will be discussed. Finally, the paper will touch base on the importance of people development and how the new technologies can be utilized to establish an integrated training system with tangible results.

Methods, Procedures, Process: Maintenance can be defined in several ways, one of which, the capacity assurance which focuses on ensuring inherent reliability of an asset or a system. From maintenance engineering perspective, this involve a series of activities or actions which result to further improvement of equipment or system performance beyond its inherent design, including parts redesign, materials upgrade, etc. Capacity assurance maintenance addresses where corrective maintenance activities exist within the Potential Failure (PF) curve to ensure the inherent reliability of an asset or system.

Results, Observations, Conclusions: The Total Plant Reliability Management (TPRM) Model is the framework that incorporates all the reliability work requirements necessary to achieve adequate Departments operations’ reliability. It sets the basis on which the concepts of TPRM are built. The model is structured around the understanding that Department operations reliability depends on the reliability of its assets, and that the reliability of the assets is dependent on the avoidance of unreliability events. Therefore, the reliability work requirements in the model are categorized into six reliability building blocks, which are built in the model in a chronological manner based on the progress of assets ‘unreliability events from inception to correction. The six reliability building blocks which are proactive, preventive, predictive, diagnostic, corrective and continues improvement work represent the different lines of defense to safeguard against unreliability events that hinder a department’s operational reliability.

Novel/Additive Information: The evolution of maintenance practices over the years goes hand to hand with the technology development. From the 1st Industrial Revolution (IR) in the 18th century where a transition occurred from hand production methods to machines, all the way to IR 4.0 in the 21st century with artificial intelligence, advanced robotics, machine learning, data analytics and the internet of things maintenance strategies undergone major changes in order to adopt to the new industry challenges and requirements.