Preventive Maintenance is Not a Static Plan

A Joint Safety Statement by
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U.S. Chemical Safety Board and
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Everyone knows preventive maintenance is important, but effective preventive maintenance programs can often fall victim to the pressure of everyday operations and short-term budgeting concerns. Industry experience, however, proves that preventive maintenance is neither an option nor a luxury - it is one of the most important elements of safety in the chemical sector.

Preventive maintenance, by definition,[1] "…seeks to reduce the frequency and severity of unplanned shutdowns by establishing a fixed schedule of routine inspection and repairs." To be effective, facility owners, operators and employees must put time and resources into developing and executing preventive maintenance programs. Yet merely sticking to a plan, however necessary, is insufficient in light of the changing nature of the industry and the workplace. Chemical facility owners and operators should regularly assess their preventive maintenance programs to ensure the plan remains effective as new technology or information becomes available and experience is gained.

On its Critical Drivers List, the U.S. Chemical Safety Board (CSB) highlights cases from its investigations where inadequate preventive maintenance was a causal factor. For example, in the 2011 Carbide Industries Fire and Explosion, the pathway that caused a furnace water leak to allow foreign raw material to enter the furnace was identified in industry literature as early as the 1960s.

Upon investigation of the 2004 Marcus Oil and Chemical Tank Explosion, CSB found the weld repair did not meet *industry* quality standards for pressure vessels. Even in cases where industry guidance is in place, additional assessment of long-held guidance may be necessary. In the Tesoro Refinery Explosion and Fire, curves used across the refinery industry were found incapable of predicting high temperature hydrogen attack, which could lead to the failure of steel equipment under certain conditions.

There are many industry groups that can assist facility owners and operators in assessing their preventive maintenance plans. Facility owners and operators should search for resources that are both specific to their operations and general to continually improve their preventive maintenance programs.

[1] Definition from the Center for Chemical Process Safety (CCPS) Process Safety Glossary - https://www.aiche.org/ccps/resources/glossary/process-safety-glossary/preventive-maintenance

The Chlorine Institute (CI) and other trade associations are resources facility owners and operators can use to gather ideas on how to improve preventive maintenance practices. CI regularly updates its written guidance for chlorine producers and users by working with its member companies to determine best practices and contracting external scientific expertise. Additionally, members share best practices during in-person meetings throughout the year. Typically, industry colleagues review highly detailed, technical, and specific safety best practices and together improve their own safety performance and that of the entire chlor-alkali industry. Similarly, there are numerous other industry conferences, classes, and organizations focused on particular issues such as corrosion, non-destructive testing or rupture disc replacement frequency among other topics.

Facility owners and operators should become active in industry safety groups, to share their best practices and experiences, learn from industry peers and contribute to developing improved preventive maintenance performance. The knowledge gained from those activities should inform preventive maintenance program development and execution. Continual improvement of preventive maintenance plans will help further the shared vision of CSB, CI, and the chemical industry as a whole: a nation free from chemical accidents.

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