New EPRI Tool Enables Nuclear Plants to Save Millions in Maintenance Costs
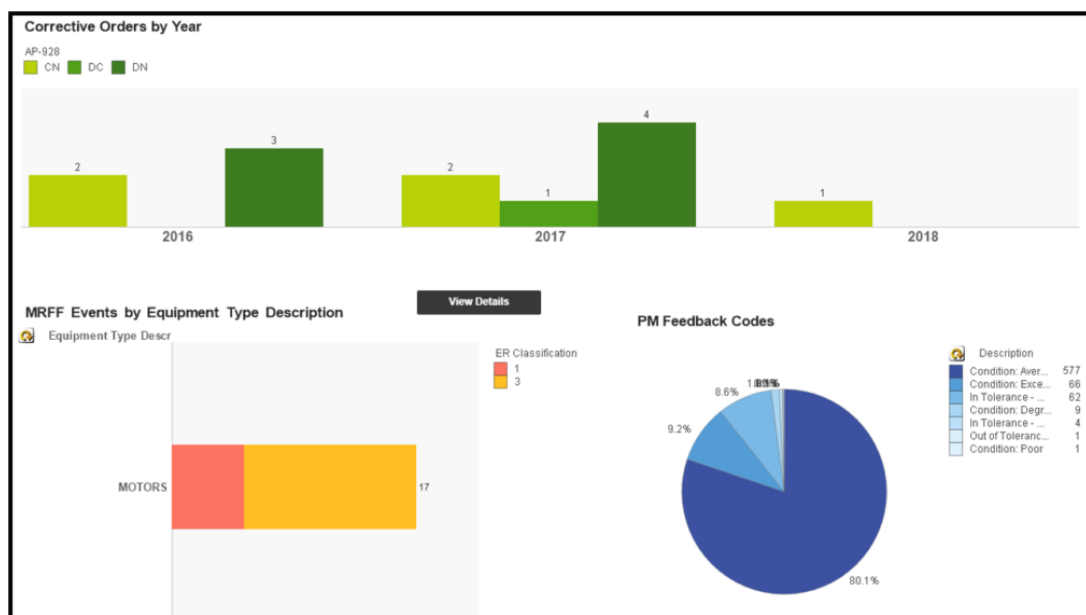
By Sarah Stankorb

Historically, the nuclear power industry emphasized "reliability at any cost," which could result in cases in which more money than necessary was spent on component maintenance for an appropriate level of reliability. Given today's challenging market for nuclear power, the industry is focused on developing maintenance strategies to achieve "the right reliability for the right cost." For example, less frequent inspections of a non-critical heating, ventilation, and air conditioning (HVAC) unit may result in slightly more failures of that component, but with no consequence to safe, reliable plant operations.

The U.S. nuclear industry recently developed a strategic plan called Delivering the Nuclear Promise to drive greater operational efficiency and affordability for customers, while continuing to prioritize safety and environmental protection.

To help nuclear plant operators identify savings opportunities for plant systems and components, EPRI worked with utility members to develop the Work Order Data Visualization Tool. This web application enables utilities to view and track historical maintenance costs (including ancillary costs such as construction of scaffolding) and draw insights about where money is being spent.

Using this tool, utility personnel can readily identify components with the highest maintenance costs and examine strategies that better balance cost and reliability. Previously, it was difficult for utilities to fully assess various costs across their maintenance regimens. When staff at Exelon's Quad Cities plant used the tool, they reviewed more than 30 complex systems with 2,700 preventive maintenance tasks scheduled in a single year. The tool made the analysis more manageable, generating charts, tables, and graphs that enabled Exelon personnel to discern key trends and identify outliers.

A screenshot of EPRI's Work Order Data Visualization Tool.

As a result of insights from the tool, Quad Cities decreased the frequency of some tasks for non-safety-related HVAC equipment, realizing $30,000 in annual savings. Plant staff also determined that certain motor inspections were more frequent than necessary. Using a less frequent, more consistent schedule resulted in annual savings of $75,000. For some systems they addressed unexpected component failures by increasing inspection frequency.

Exelon used the tool along with another application to examine its maintenance strategy for several non-critical components, using 11 years of historical data spanning its nuclear fleet. The company identified its 10 costliest, non-critical components and streamlined unnecessary maintenance for an estimated $80 million in annual savings across its fleet by the end of 2025.

Researchers have collected data from 21 utilities, using the data to develop a separate app for each utility. EPRI plans to develop an automated data upload feature in the tool, further streamlining these analyses. Other plans include:

- Demonstrating the tool's value in analyzing other data sets such as those from electronic work packages
- Expanding its use to new companies
- Developing additional apps to help utilities forecast spending over the next 20 years

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