



SUMMARY

Exelon® Corporation

Industry

Nuclear, Power Generation

Business Value

- Improved plant safety
- Automated data collection
- Focus on analytic power
- Optimum plant maintenance
- Fast diagnostic and repair
- Improved plant reliability
- Efficient expert knowledge capture
- Improved staff productivity
- Simplified regulatory cooperation

PI System™ Components

- PI Server™
 - Asset Framework
 - Event Frames
 - Notifications
 - Data Archive
- PI Vision™¹

Exelon Ensures Nuclear Power Plant Safety Using Online Monitoring

Exelon Corporation is the largest owner and operator of nuclear plants in the United States. With 23 reactors at 14 facilities in Illinois, Maryland, Nebraska, New Jersey, New York, and Pennsylvania, Exelon produces nearly 34,000 megawatts and powers millions of homes. Exelon believes the safety of the community and its workers is its highest priority, and that good maintenance ensures safety.

Industry standards for good maintenance procedures have been based on manual data collection and analysis, time-based maintenance schedules, and resource-intensive preventive maintenance. Plant engineers physically collect plant data from sources all over the plant, including areas that might pose a radiation exposure risk. Collection is scheduled according to worker shifts, perhaps every 12 hours, leaving long periods for a fault to develop.

Advanced Monitoring

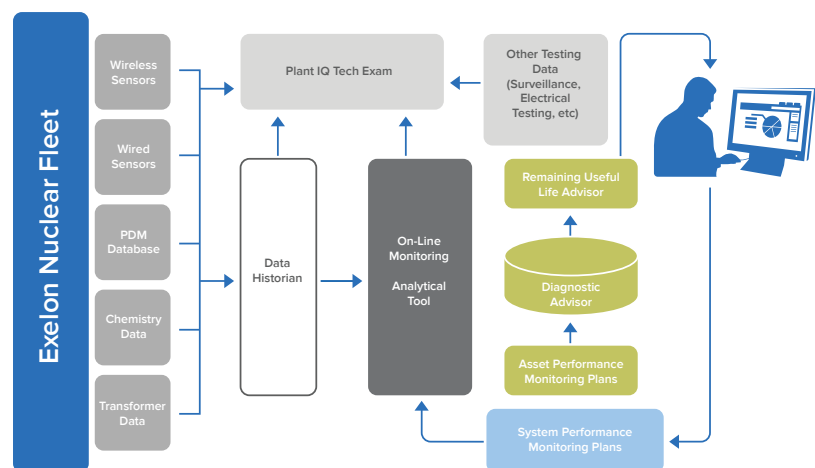


Figure 1. Exelon's advanced monitoring system enables plant engineers to devote more time to analyzing data and identifying potential maintenance issues.

Traditional preventive maintenance procedures are based on the failure rate history of a component, such as a pump. If historical data indicates that the pump fails every 10 years, preventive maintenance procedures would call for an inspection and recommissioning every eight years, regardless of the actual state of the pump. Such procedures have proven to be inefficient.

To address these problems, Exelon has employed OSIsoft's PI System for online monitoring. Using the PI System, Exelon has optimized the efficiency of its operations, maintenance, and engineering staff. By automating data collection, plant engineers now focus on analyzing data rather than manually collecting data and risking radiation exposure. "With this technology you use a condition-based cycle," said Mohammed Yousuf, Exelon Senior Staff Engineer. "You don't have to access the asset until the asset tells you something is going wrong."

Using the PI System and advanced pattern recognition (APR), plant engineers at Exelon collect plant data, retrieve it for analysis, receive alerts for anomalous operating conditions, and correct faults with enough time to prevent system problems that could force the company to derate, shut down a unit, or compromise safety. "Time is of the essence," said Yousuf. "The sooner you find out there is a problem, the sooner you can do something about it."

For example, early detection of a control card failure enables operators to manually control levels to prevent a unit trip. Additionally, Exelon can capture the collective knowledge of engineering with years of first-hand plant experience.

The system merges the knowledge plant personnel have gained over time with hard data gathered from thousands of wireless sensors to create a detailed database of asset conditions that can be monitored instantly. As a result, the data is accessible — and actionable — in real time.

The move to automated data monitoring provides clear benefits. While plant monitoring has been in place for decades, online monitoring using the PI System makes better use of plant personnel in operations, engineering, and maintenance.

If you'd like to learn more, please view the entire presentation [Technology Innovation and Condition Based Monitoring](#).

Benefits of OLM Approach:

- Reduced engineering work load by 10% by offloading staff data collection to the OLM
- Optimized operations staff rounds by aligning panel data to data histories
- Reduced potential exposure to radiation during manual data collection by using remote data monitoring

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- Mohammed Yousuf
Exelon Senior Staff Engineer

¹ PI Coresight was renamed to PI Vision in 2017.

Yousuf, Mohammed. *Innovative Technology - Condition Based Monitoring*. OSIsoft.com. 27 Mar. 2014. Web. 12 February 2015. <<http://www.osisoft.com/Presentations/Technology-Innovation-and-Condition-Based-Monitoring>>.