Decision Support for Operations and Maintenance

Diagnostic software reduces O&M costs

Decision Support for Operations and Maintenance, or DSOM®, is an intelligent diagnostic operations and maintenance software program that could improve asset management in process-oriented industries such as heating and cooling plants or pulp and paper processing.

The cost of operations and maintenance (O&M) can make or break a business—especially with today's rising energy costs. Pacific Northwest National Laboratory has developed an intelligent diagnostic software program that increases productivity and helps ensure that equipment is running efficiently. DSOM®, which stands for Decision Support for Operations and Maintenance, can reduce a facility's life-cycle O&M by as much as 25 to 50 percent.

These significant savings are realistically achievable because the DSOM information management system

- improves process efficiency
- reduces maintenance costs
- reduces energy consumption
- dramatically extends equipment life.

DSOM allows online condition-monitoring of equipment and provides early warning signs of degraded performance. It is designed to allow operators to make informed decisions about how to operate their plant more effectively.

Real-time monitoring

A network of sensors, usually an extension of existing monitoring capabilities, constantly feeds information regarding the performance of the facility's components into a computer.

The DSOM software integrates this data, compares it to information in a customized facility database and lets operators know in real-time if a system is malfunctioning or running below expectations. Beyond looking for early warning signs of problems, DSOM identifies conditions that could potentially lead to a problem, determines the root cause and recommends solutions.

Condition-based management

DSOM was built around the concept of condition-based management. This approach focuses on finding the balance between high-production rates, machine stress and failure. DSOM's diagnostic and prognostic capabilities empower the operations staff to become the first line of maintenance. The system provides the information they need to decide how and when to change operations to avoid failure.

A holistic approach

Before DSOM is installed, PNNL performs an initial assessment of a facility's physical condition and performance levels and of the organizations' O&M infrastructure. With this baseline data, we can identify and prioritize improvement opportunities. Some will be addressed easily with the DSOM software, but others might require suggested changes in organization and infrastructure.

By taking this holistic approach, we create an enterprise-wide system that makes it possible to achieve the highest level of effectiveness and the greatest economic impacts.

A customized solution

As part of the initial assessment process, PNNL works with supervisors and operators to create a customized database for the facility that will drive the DSOM system for the entire organization. We tailor DSOM's software tools based on the plant's design and guidance on plant performance and safety considerations.

Varying views

DSOM displays information regarding a system's health and potential problems in different ways for different people in the organization. For example, one view is designed for operators while another would be more useful to engineers. These intuitive, object-oriented displays along with a point-and-click interface make the system easy to use, requiring little training. By providing information to various people in a way that is familiar and helps them do their jobs, DSOM links the plant operations and maintenance staff, engineers, and administrators in the same enterprise-wide, web-based system.

The bottom line

DSOM was originally developed for the U.S. Marine Corps. In 1994, it was installed at the central heating plant of the Marine Corps' Air Ground Combat Center in Twentynine Palms, Calif. Since then, the facility has reduced its O&M expenses by 33 percent saving about $500,000 a year in life-cycle operations and maintenance costs.

In addition to Twentynine Palms, DSOM has been installed at the Marine Corps' Parris Island facility in South Carolina, where annual O&M savings of more than 35 percent are predicted.

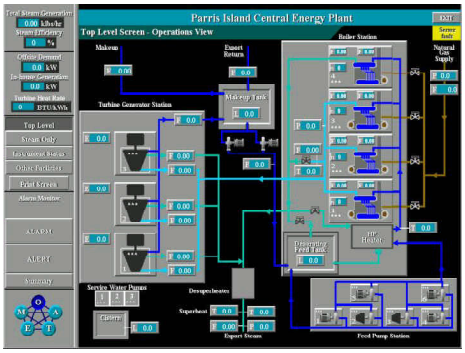
Under a contract with the New York City Housing Authority, DSOM is installed at a central boiler plant that serves 4,500 residents in a Manhattan housing complex. O&M savings have exceeded expectations.

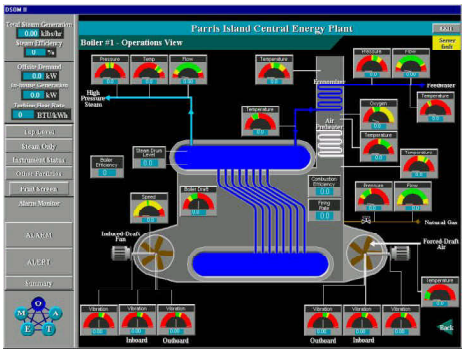
DSOM's point-and-click interface makes it easy to learn and easy to use. At the Marine Corps' Twentynine Palms central heating plant, training time for new operators was reduced from two years to six months.

Putting DSOM to work

DSOM has potential applications in nearly any process-based industry. Some examples might include central district heating and cooling, steel and aluminum production, pulp and paper plants, and pharmaceutical production.

PNNL is seeking new customers who are interested in applying this technology at their site.





The image on the left represents the top-level operations view for the Parris Island Central Energy Plant. Operators can click on various components within this screen to get a more detailed view, like the one on the right that displays one of the facility's boilers.

Please contact us for more information or assistance:

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PNNL-SA-34065 March 2003