Reliability-Centered Maintenance to help us better manage assets

by Dennis Schurman

(Note: This is the second of a two-part series on Reliability-Centered Maintenance. In the Nov. 19 issue, RCM was defined. This article discusses Western's interest in the program and our implementation plans.)

Western has more than $2 billion invested in assets, or more specifically, equipment. Our ability to meet our mission is based largely on whether this equipment is available and operated effectively. Each region has a maintenance program to help us meet that mission. Yet changes in the industry, Independent System Operators and new reliability standards are prompting Western (and other utilities) to re-evaluate when and how to perform maintenance.

Just like the electric utility industry, much of our existing maintenance program is based on time intervals. Yet a time-based program, which requires taking equipment out of service for maintenance, can contribute to overmaintenance—a potential waste of money and resources. Plus, some pieces of equipment may need more maintenance than others.

Today, outages are becoming more difficult to schedule due to heavy loads on the grid. Within Western, much of the time-based maintenance is not occurring due to lack of resources or other system emergencies.

For these reasons, the era of a purely time-based maintenance program at Western has already come and gone. To determine the best maintenance schedule, we must now evaluate each piece of equipment on its function and what happens to the entire system if it fails. This is the thrust behind RCM.

We are now beginning to implement RCM at Western, including reactive, preventive (includes time-based), predictive and proactive maintenance. Equipment that can greatly impact system reliability must be maintained differently than equipment with no high impact on the grid.

Western's BMX system will play an integral role in implementing RCM. MAXIMO will be used to analyze vast amounts of data. As work orders are completed, maintenance staff will collect additional data, capture any failures that occurred, analyze failure trends and track the corrective or preventive action taken. They can then calculate statistical information from this data, which will further enable Western to achieve optimal maintenance and meet the requirements of outside maintenance audits (from the Western Systems Coordinating Council, Independent System Operators, etc).

Leading the RCM effort at Western is the Sierra Nevada Region, which is feeling the most pressure from changes in the industry. The Independent System Operator within California is implementing stringent operating and maintenance requirements for utilities statewide. If SNR joins the ISO (possibly as soon as April 2001), it will be held accountable for meeting strict reliability criteria, which include a rigid maintenance program.

Under this program, outages cannot be taken on any line or location without ISO approval. SNR will have to submit a yearly outage schedule, which must be updated semi-annually. The ISO wants to know what maintenance SNR will be doing, what alarms (if any) it might see, what circuits would be impacted and what problems could arise. Unscheduled outages will be subject to sanctions. The only acceptable forced outages will be those caused by

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earthquakes. SNR will be held accountable for all other system outages.

With these strict requirements and to improve reliability, SNR is re-evaluating its existing maintenance program. **Tom Boyko,** SNR maintenance manager, and his maintenance team of **Norm Miller, Richard Perry, Ross McFate, Larry McAllister, Chuck Cooper** and **Jim McHan** have begun the tedious process of collecting the necessary data and information to establish the RCM program. Boyko said they are identifying key facilities, triggers indicating impending failures, diagnosing the failure consequences and the action to lessen the impacts of those failures.

"We must be ready to defend our maintenance schedules, practices and outage schedules. The program covers all aspects of the business, such as transmission lines, substations, communications, relaying and controls," Boyko said.

Once the information is collected, it must be prioritized to determine the appropriate maintenance schedule. "To change maintenance and operation in this sort of environment requires that all stakeholders be drawn into the RCM process, learn it and apply it in a controlled manner," he added.

The Rocky Mountain Region has also started implementing RCM. **Jim Tomsic,** Western Slope maintenance director, is heading up a team of engineers, managers and craft employees. When asked how RCM will benefit RMR, team members said it would provide the region a well-documented maintenance program that will hold up to possible public scrutiny regarding reliability and cost efficiency.

"RCM should be rigorously implemented. We are at a crossroads in Western. In the past, we have had the luxury of sufficient financial resources and people with whom to operate. That day has ended. Right now we are riding on the coattails of that era," said **Mike Davila,** an electronics equipment craftsman in Shiprock.

"The competitive environment we find ourselves in today will require us to work smarter with fewer people. RCM seems to be the answer to this dilemma. Implementing RCM would continue to keep us leaders in the electric utility industry," he added.