

# EQUIPMENT RELIABILITY

## Diversity initiative gains traction

### *A cross-functional approach to reliability is delivering promising results*

Over the past three years, the COG Equipment Reliability Peer Group (ERPG) has been developing a more diverse approach to a committee once comprised primarily of engineers.

In 2013, the group, facilitated by COG Project Manager Ken Keown, and then-group chair Steve Miller of Bruce Power, moved to a cross-functional peer group to capture the knowledge and input of people working across the spectrum of plant roles. It has given them a 360-degree look at how to better tackle equipment reliability.

At their semi-annual conference, held in November 2015, the group was able to look back at the work of the past three years and celebrate the improved results accomplished as an outcome, in large part, by this strategy.

Prior to 2013, “the committee was highly-engineering centric,” says Miller, who finished his role as committee chair this year but who continues to participate on the peer group. Given the field dynamic requires a cross-functional team approach, it only made sense for the COG peer group to mirror that.

“The information from the people working in the field needs to get back to the engineers doing the maintenance strategy to make it more effective. Everyone needs to be working together and providing feedback so we know the right resources and where they should be applied,” says Miller.

Adds Keown, the result has been products that reflect well-rounded insight and can be integrated into plants across the CANDU fleet for better operating plants.

The international composition of the ERPG means lessons are being gathered from many perspectives and different approaches. The peer group consists of all the Canadian operators as well as Argentina,

China and Romania. Results from implementation of the group’s work are also trending upward on an international basis, which is significant given the integral role of reliability in a nuclear plant’s success.

“You cannot have effective station performance if you haven’t got equipment health,” says Keown. “And station performance is a measure recognized worldwide... and with these economic times you’ve got to maximize performance.”

As for the November conference, Keown says it was of tremendous value for those who participated to have not only the opportunity to network and discuss but also to see strategies in practice.

“Not only did we work collaboratively on key equipment reliability activities and share practices that will help each other, but we were able to witness first-hand Bruce Power’s strategic activities and important meetings that support equipment health,” says Keown.

As a peer team, the ability to collaborate, create processes and then see them executed is full circle of what peer groups are intended for, and seeing that reality coming together was hugely satisfying. 🌟



Photos courtesy of Bruce Power

## Step 1: Creating a blueprint for reliability

Gathering lessons learned is just the starting point to tackle a problem. The next step is creating a strategy that can be replicated to effectively manage it on an on-going basis and making it work in the plant.

The Equipment Reliability Peer Group (ERPG) has developed a series of documents that provide tools to be adapted to each COG member's own situation and needs (see links at the end of this article) to move the theory into reality.

"One of the key aspects of getting this group together is working on products that everyone can use parts of in terms of improving equipment reliability," says Keown. "They can use part of it, all of it – it's the best practices from all of the sites in one spot and that's the advantage."

At the peer group's November conference, Bruce Power shared how some of the initiatives have taken root at their site.

**The Equipment Health Initiative** has helped the company better identify priorities for their maintenance programs and the results have included improved performance, lower backlogs and, ultimately, better redundancy of necessary and even critical equipment. At its roots, the initiative uses the principles of the cross-function team approach to bring engineers and maintainers together more immediately and in a more coordinated manner.

**Preventative maintenance (PM) strategy:** At Bruce Power, where engineers once relied on an equipment rating report from maintainers that might be a month old by the time the report was filed and the engineering team actually reviewed it, the connection between the engineer and the maintainer has become much closer, with meetings taking place within a week and more fulsome reports that include more detail of what the maintainer saw during the inspection process.

The assessment process for the equipment has changed as well.

**A component classification review** allowed CANDU operators to rethink how they categorize equipment in two criteria: Required maintenance frequency and criticality. The two criteria in tandem create a matrixed approach to maintenance decisions that helps better determine which equipment gets priority and when.

At Bruce Power some preventative maintenance was actually scaled back after the analysis indicated the component condition was consistently high. By reducing unnecessary maintenance, managers were able to ratchet up maintenance on higher priority equipment, such as parts related to safety or of higher criticality to performance in general or those that seemed consistently degraded during routine maintenance visits.

"This is about doing the right work at the right time and we want to make sure we are doing the most necessary work," says Miller.

**Condition-based maintenance (CBM) strategy:** While the move to a CBM strategy in itself has been helpful to improving reliability across the CANDU fleet, the group didn't stop there. The approach has been subjected to further refinement.

One initiative the peer group observed while at Bruce Power is the **Catch, Saves and Misses** identification process that helps the company track its human performance on reliability initiatives. Each maintenance report is binned into one of three categories:

**A Catch:** Information was proactively used to get equipment onto the maintenance schedule before it failed;

**A Save:** Equipment that should have been identified sooner but still gets repaired ahead of a failure;

**A Miss:** Information was not used in time to avoid a failure.

The program reinforces the value of communication across work groups, says Miller. "It helps people think about how we use information and also helps us to engage the maintenance folks by showing how their information is useful."

## Step 2: And measuring progress

Whether its equipment reliability or any station performance indicator, the key to successful tracking is to ensure you have the right measures to catch emerging trends early thereby ensure performance success in the places it matters most.

Over the past year, the COG Equipment Reliability Peer Group (ERPG) has developed a new set of metrics to ensure the right measures are being taken to optimize performance and work management efficiency.

This is particularly important in a nuclear landscape that is not standing still anywhere, says Keown. "The US is changing and we have to be in step... As an industry we are progressively focusing on key elements that will drive up equipment reliability."

While the first step was identifying the focus areas the second is tracking them in a meaningful way and finally, it means relentlessly chasing down areas for improvement until they are trending GREEN. To achieve this, the team has developed a system that moves away from a four-colour system. Keown says the previous colour system may have inadvertently encouraged complacency so the team recommended a three-colour system that conveys a more appropriate sense of urgency. Where the old system included a WHITE level

between YELLOW and GREEN, today the system gives no middle ground between action required and a satisfactory rating.

"If you're in yellow, you want to get out of it and get to green," says Keown, adding, senior management have been on board and the new coding is being adopted elsewhere with other plant initiatives.

In addition to the change in coding, the new indicators also shifted the weighting on the items tracked to better reflect criticality. The changes were made only after significant input right across the international fleet, says Keown.

"There was a huge amount of collaboration, validation and stakeholdering," he says crediting the group for its tenacity in getting the new indicator into pilot testing. The group anticipates the full CANDU fleet will be using the new indicator by 2017.

Early results suggest it is making a difference, with steady improvements in 2015 including a particularly positive fourth quarter result.

Says Keown, "It was an unbelievable amount of work to get us here but it is just that important for the industry that makes it more than worth the effort."