

THE NUCLEAR NEWS INTERVIEW

John Dowling: Ensuring equipment reliability is a job that never ends

The goal is to find potential problems before they become reality.

John Dowling is the equipment reliability manager at the Callaway Energy Center in Portland, Mo. The plant is operated by Ameren Missouri. Dowling and his staff of four engineers form the Equipment Reliability Group at the plant.

Starting in 2018 and into 2019, Callaway operated continuously for 467 days in a breaker-to-breaker run—which means that it operated from one refueling to the next without being out of service. The run marked Callaway's fifth breaker-to-breaker stretch since it began operating in 1984: the first coming in 2008 (520 days), the second in 2012 (489 days), the third in 2013 (500 days), and the fourth in 2017 (514 days).

Dowling has spent his career working for Ameren, which owns Callaway. Before joining the nuclear plant, he started on the ground floor while still in school before moving up to meter reading and work in substation construction and repair. He started at Callaway in the 1980s as an electrician and then became an electrical training supervisor. He filled various rotations for the next 15 years with the maintenance and planning



Dowling: "I cannot underscore enough that it is a team effort to support equipment reliability."

groups. Dowling became the supervisor and then the general supervisor of maintenance leading up to 2000, after which he became a work week manager, overseeing and orchestrating the daily schedule for the week. He then transferred to engineering work week manager. It was then that he first got involved with equipment reliability.

It was 2003, and Dowling noted that equipment reliability as a process was just starting in the industry in terms as they are understood today. He was supporting the development of a preventive maintenance program and similar activities. He became equipment reliability manager in 2008 and

has had that role since then.

Callaway was recognized in August by the American Nuclear Society with the Meritorious Performance in Operations Award for the plant's online equipment reliability excellence that has resulted in five breaker-to-breaker runs over the past 12 years.

Dowling spoke with Rick Michal, ANS director of publications and standards, about the equipment reliability program at the Callaway nuclear power plant.

Is your staff responsible for all the components in the plant?

The equipment reliability staff is charged with ensuring that we have programs that support reliable equipment. We administer the station's preventive maintenance program, and two regulatory programs that monitor key equipment reliability and availability under our maintenance rule and mitigating performance index programs. We do failure trending, looking for common causes and common equipment issues. If we see a trend, we enter those into our corrective action program to get resolution. In addition, we facilitate and ensure that equipment-related improvement projects get risk ranked, reviewed, approved, scheduled, and funded. In doing this, we support the larger Callaway team. Each member of the Callaway team is responsible for all the components in the plant.

Does your staff work 24/7?

The station's operations and security staff are on site 24/7. The maintenance and engineering personnel work a normal work week, but are available around the clock if needed. My staff works a normal dayshift schedule. During the work day, the station's staff performs periodic surveys of the plant equipment on an ongoing basis. Through the course of an 18-month operating cycle, we will visit every component to get a sense of how it's behaving. These visits will be exploratory, where there would be no indication that something is wrong, but we visit just to see if there are indications of something going wrong.

We rely primarily, of course, on our operations staff to be the station's eyes and ears. There is a lot of equipment that our operations technicians check on shift throughout the plant, making notations about subtleties. The technicians are there all the time and will notice things. We also depend on our security force to notify us of issues. The security force is often in a portion of the plant where many others don't get to very often. Security goes through there on a regular basis. They can check things that don't seem right. When they do find something, they report it.

Your goal is to identify an issue before it becomes an issue?

Absolutely. The primary goal of the equipment reliability program is to identify those items that could result in the failure of an important piece of equipment early on and to start looking at measures to prevent the failure from actually occurring. It's a very strategic practice we're involved in.

What are the challenges for your program?

If there is an item where we need to get ahead of it before it can fail, we do what we call risk ranking. Sometimes we have

to make decisions between items that seem to be equally important. We have to allocate the resources available to us to service those items of greatest importance or those of the most urgent need. The challenges we get are those sorts of things. For those challenges, we depend on the rest of the leadership team at the plant—and actually everyone working at the plant—to provide us with input on how important the challenge is so that we can make a good and sound risk ranking.

Then the decision about what to do about the challenge usually falls on our engineering staff to provide the options needed to resolve it, as well as getting other technical input into the challenge, and on how urgent it is and how much of a margin we have to deal with. We take that information to our leadership—at our plant, that's the department director level—and they collectively review the data and decide when and how

to fund the resources to resolve the challenge. The idea is that the challenge is not a problem yet, but it will be if we ignore it.

It seems that there is no finish line for your group, is there?

You are correct. We are never done and we're never going to be done. When I say "we," I mean the entire Callaway staff. It's a daily task to ensure that we always look forward at what potentially can fail and to do something about it before it happens. It's a strategic view that needs to be maintained on a daily basis. It's something we have to do and it's one of the most important lessons learned. We can never say, "We're reliable now. We're fine." If we don't see anything coming our way, we still need to keep looking and be on guard. We have to engage as many people as we can to help in that.

As an example, during our last outage, one of our supplemental workers reported to the shift engineering leaders that he was working on an expansion joint and that something didn't look right. He'd taken a picture of it and showed it to me. I said he was absolutely correct, that something was wrong. It happened that the expansion joint needed to be able to flex, and this one had tightened up on one side and could have caused real problems had it not been identified. That, in turn, caused our plant engineers to walk down all the other similar joints at the plant during the outage, and we ended up making adjustments to a number of them. That's an illustration of how the Callaway team, including our supplemental workers, get engaged in supporting equip-

ment reliability. His intervention allowed us to address the issue immediately.

What lessons have been learned during your time in your position?

The first is that we have to learn from our mistakes. We can't keep doing the same thing and expect different results. When something does fail, we have to do as much as we can to learn from it. That is, commensurate with how important that piece of equipment is, and that could entail making adjustments to our processes to make sure something like the equipment failure doesn't happen again, but also that an early warning is put in place.

It's a daily task to ensure that we always look forward at what potentially can fail and to do something about it before it happens. It's a strategic view that needs to be maintained on a daily basis.

In that regard, we may increase our monitoring or change how we do our monitoring of a particular piece of equipment. We learn from our events, but we also learn from other plants' events. We are fortunate that we are part of the STARS Alliance, along with the Diablo Canyon, Palo Verde, and Wolf Creek nuclear power plants. We communicate frequently with each other to discuss challenges and issues in equipment reliability. We also reach out to other operating units through the use of INPO's IRIS [Industry Reporting Information System] program, through which the operating-experience reports from other plants are available. We review those reports to see if we have the same or similar equipment and, if so, could there be a similar experience at our plant. We ask ourselves if it's something we should act on and do we have it covered in our station programs and procedures. Learning from others and learning from ourselves is the primary lesson learned.

Equipment reliability seems like it goes beyond your group to encompass many others at the plant.

That's right. I cannot underscore enough that it is a team effort to support equipment reliability. It's not just engineering, or maintenance, or operations, or work management. It's everybody working together collectively to get a focus on holding critical equipment to the highest standard possible. It takes effort to build teamwork and the common understanding of what is important and making sure that individual goals and needs don't take

Outage Management and Plant Maintenance Special Section

precedence over what the site needs at the time. That probably is our biggest challenge and accomplishment, ensuring the common understanding of issues.

During outages, do you have any special jobs that are outside of your Equipment Reliability Group?

Yes, but we also continue all of our online roles. During an outage period, many of our activities have to keep going regardless of whether we're online or not. At the same time, because I have an engineering leadership position, I support the engineering outage team. We deal with emergent issues, as well as ensuring that all the

engineering work during the outage is executed on time. We are often in charge of or providing technical support to a troubleshooting team when something starts to exhibit issues.

Two of my direct staff go work on our emergency diesel generator maintenance project. Another one of my team qualified as a thermographer. Thermography is "temperature photography." During an outage, we may be challenged, at a moment's notice, to send someone out to take a thermography reading and determine if we have a problem. We have an infrared camera, and we look for hot spots on equipment that may indicate a problem.

Thermography is just one of many predictive technologies that we employ to access the state of a piece of equipment.

Can thermography be used for electrical equipment and not just mechanical?

Absolutely, thermography comes into play very often with electrical equipment. I could have three connections right next to each other, two of which could be cool and one could be blazing hot in comparison. That would be a good indication that I have a loose connection that needed to be tightened up or there could be a damaged cable that could ultimately cause a fire.

When your team identifies emergent work, who takes action on it?

When emergent work is identified at the station, we usually assess it using our FIN [Fix It Now] teams. Like many other stations, we have a maintenance FIN team. We also have an engineering FIN team that provides the immediate support for emerging items. Each FIN team supports the other very well. They deal with the bulk of our emergent work. If it's something that's beyond fixing immediately and requires more extensive planning to execute, then we would take that piece of equipment out of service if needed until we could get the job planned correctly, the available parts in house, and so on. That would then go into our normal plant work. It's not unusual and most plants do something similar.

Callaway won ANS's Meritorious Performance in Operations Award in 2019. Is that a "whole plant award" or does any unit or group take more responsibility for it?

This is a site award. The award is recognition for all the dedication and teamwork that goes on at the station. That is why we sent a team to receive the award from ANS in August. We were representing the entire station and it's really a tribute to everyone.

We also need to recognize the support we enjoy from our corporate leadership. We're a member of a much larger corporation, but we're the only operating nuclear station in that entity. We enjoy strong support both financially and technically from the larger expertise of Ameren Corporation. It's not just a station award. It's also a corporate award.

Our chief nuclear officer, Fadi Diya, summed it up best when he said: "I am very proud of the Ameren and Callaway team in making this unique accomplishment. This was the result of significant collaboration and focus by our co-workers in doing the work safely, correctly, to the highest standards, and with conservative decisions. Simply, this was the right thing to do and our work is never done. We still have a lot of exciting improvement opportunities ahead of us." **NN**