

Outage personnel describe concerns and trends

BY RICK MICHAL

FEEDBACK FROM ABOUT a dozen U.S. nuclear power plants in response to questions asked recently by *Nuclear News* provided an anecdotal insight into the concerns and current state of outage management at the sites.

Significant trends

Almost all respondents noted that briefer refueling outages are a significant trend in the industry. Said an outage supervisor: "Refueling outages will be at 30 days or less as the standard," due mainly to "better planning and having contingency packages ready."

But more important than outage duration is cost reduction, noted an outage director. "The durations," he said, "will continue to decrease, but the focus will be on reducing costs. There are a couple of areas ripe for cost reduction. The first is reducing the scope of PM [preventive maintenance] work, which needs to be based on performance rather than on vendor recommendations, because the vendors have their own interests in mind when recommending PM frequencies. Another area is workforce productivity, where in-house workers need to improve productivity to reduce the reliance on contractors."

That response contradicts another sent in by a utility staffer, who thought that the trend was toward hiring *more* contractors, not fewer: "Keeping our own people for high expertise jobs" is the priority, he said.

Other trends noted by respondents included reducing outage dose ("heading toward the 100 person-rem/outage range," said an outage supervisor), performing more work on line, and sharing resources among plants ("Utilities will have to learn from each other in order to survive," said an outage manager).

Problems and some solutions

As could be expected, outage problems described by the respondents ran the gamut. A reactor engineering technician highlighted three issues: outage design change packages, getting analysis performed, and having spare parts delivered to the plant on time for outages. His solution for all three issues was to compose a dedicated engineering resource group "to work directly with outage management to track design changes."

One outage supervisor stated that he worried about "strained resources," and wondered if his organization could begin planning future cycles in detail to ensure that resources for upcoming outages would be sufficient. An outage manager agreed with that concept of long-range planning, but his concern was with the effects of utility deregulation on outage scheduling. Said that outage manager: "It is critical to focus the site on starting and completing the outage planning early, so that any impacts from deregulation can be absorbed and minimized."

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Shorter schedules, according to another outage manager, challenge the plant in managing the risk of major evolutions, such as during shutdowns, startups, and midloop outages. "Shorter schedules force more activities to be performed in parallel and increase the risk of a major event due to human error," he said. "Review of operating experience shows that outage errors and events are continuing." He added that "single unit stations cannot economically justify a large dedicated outage planning staff and must rely on matrixed resources."

A third outage manager said he didn't like "being squeezed" between outage scope control on one side and the Nuclear Regulatory Commission's Maintenance Rule and system unavailability goals on the other.

A superintendent of plant scheduling stressed that salesmanship was necessary to get workers to buy in to preoutage planning. That comment was supported by an outage director who said that "as outages get shorter, the support required for an outage will increase. The solution for this is management reinforcement of short outages."

Finally, a utility staffer warned that while the industry has spent plenty of time and money on the research and development of primary side issues, the secondary side has been largely ignored.

Vendors, contractors

While a portion of the respondents saw no problems with the work done by nuclear steam supply system (NSSS) vendors, component manufacturers, and contractors during outages, some concerns do exist because of the quality and price of work and the availability of workers. Said one outage director: "NSSS vendors are going to price themselves out of the market. The larger utilities now have the competencies to provide similar expertise for much cheaper." Said another: "[Turbine manufacturers] offer poor performance. [They are] not used to short outages and following schedule." One outage manager, while generally satisfied, complained that use of a contractor during a steam generator chemical cleaning added 10 days to his plant's outage schedule.

A few comments were positive. For example, an outage supervisor complimented an NSSS vendor for "becoming more innovative."

And some outage personnel understood why contractors might have problems. One assistant plant manager said that his plant's contractor companies were "dealing with the same issues [as nuclear plants in trying to retain] a qualified work force. Many are using retirees as expertise. What happens when they are gone?" An answer to that may have come from one utility staffer, who said, "We were getting individ-

uals during our last outage that were off the streets and had never been at a nuclear plant."

Manpower staffing

Taking a closer look at the contractor staffing of nuclear plants during outages, most respondents agreed that this was a major issue. An outage manager noted: "Qualified contractors are increasingly unwilling to come in for short outages. We are using more shared resources from other utilities. However, that can have an adverse impact on our on-line work backlogs because we are expected to reciprocate."

An assistant plant manager had a one-word answer to the question of manpower shortages—"Absolutely!"—while a plant scheduling superintendent said that his plant had "a problem getting craft personnel (pipefitters, boilermakers, laborers)" on site. A solution might be to try to "guarantee hours" for these workers, he said.

The number of hours on the job appeared to be a problem in attracting workers. "The contractors are less likely to leave one job [at an offsite location] for a job at a nuclear plant that might last only 15 days," said an outage director. He added that "the craft workers do not like coming to nuclear plants because of the administrative controls and the short jobs that are not very attractive." He mentioned that he would like to see the industry work with trade unions to ensure that workers are moved from one plant to another as outages start up and end.

An outage supervisor stated that both in-house and contractor resources at his plant were wanting. Besides shorter outages, he said, part of the problem of attracting workers is the current state of the economy, which has caused long-term construction jobs to be abundant and makes the work at nuclear power plants "less desirable."

Only two respondents had no problems in attracting enough workers for outages. One credited resource sharing with helping to avoid shortages.

Organizational influence

Only a few comments were offered on the influence of industry or government organizations on outage management. An outage director saw some good things coming from his NSSS owners group outage management committee meetings, where lessons learned and good practices are exchanged. He also credited peer visits arranged by the Institute of Nuclear Power Operations with helping identify problem areas at his plant.

But critical of INPO and the NRC was one assistant plant manager, who said these organizations had an "over-emphasis on safety system availability [that] can drive more

scope into outages and may ultimately cause the industry to defer needed maintenance until the outages arrive."

Another comment had to do with training workers to INPO standards: "Currently, it will require almost two weeks of training to take a contractor off the street and [qualify him/her to be an independent worker] to do jobs on specific components," said an outage manager. "It is very expensive."

Outage improvements

A variety of perspectives were offered regarding ways of significantly improving outage performance. An outage supervisor credited newer scheduling tools and standardized planning for allowing his organization to better understand performance expectations. However, he added, "the biggest factor that affects duration is an organization's attitude."

An outage manager agreed with crediting scheduling tools, yet stressed the importance of developing an outage "script" that details all control room activities. "This allows everyone to understand what the control room is doing at any time and also improves handoffs between the craft and control room," he said. The script has activities down to the minute, he added, and the results "are outstanding in improving efficiency and general employee outage knowledge."

Kudos were launched in the direction of company executives at one nuclear plant, where their support has "optimized refuel outage performance," said an outage director. The executives' support has been demonstrated, the outage director continued, through their presentations on outage performance to stockholders, regulators, and company employees. The executives have also gotten into the details of outages and understand work scope, budgeting, and critical path. "Since they know these things," he added, "they expect the site senior managers to know at least as much." The executives also ensured that shorter outages have not resulted in cutting required work. The bottom line, the outage director concluded, is that "executive support has reduced

the amount of site senior management resistance to improvement initiatives and resulted in reduced durations, dose, and dollars."

Other credits given by respondents were to the development of "One Stop" shops, improved coordination among departments, incentive programs for workers who do good jobs, obtaining lessons learned from work-shops, benchmarking by visiting other nuclear plants, teamwork, development of scope-control committees, and reviews of PM programs that include engineering evaluations.

Things weren't so rosy for one nuclear plant, however, where outage durations have actually increased, according to a plant scheduling superintendent. "We've gone backwards on this one and need to redefine our processes," he lamented.

Durations, cycles

On the subjects of outage durations, mid-cycle outages, and operating cycles, many respondents provided generically similar opinions. Regarding duration, most said, without being specific, that their plants were looking only to "reduce" outage times. Those few giving specifics said their current outages averaged in the high 20-day to lower 30-day range. But one plant manager was bold enough to predict that refueling outages would soon average less than 20 days for the industry.

Only one plant among the respondents actually planned for a midcycle maintenance outage; the rest had no plans for shutting down for midcycle maintenance. Nor were there many cases of unplanned outages that had shut down plants in recent cycles.

Regarding lengths of operating cycles, most respondents stated that their plants operated 18 months, startup to shutdown. One plant, however, planned to increase its cycle from 18 months to 24 months within the near future, and two plants already were at 24 months. An assistant plant manager at a plant with a 16-month operating cycle noted that his unit couldn't increase to 24 months "because of its power density limits."

Restructuring and costs

A strong comment about the effects of restructuring/deregulation on managing O&M costs came from an outage supervisor, who said, "We're a business now. If we don't make money, we don't have a job." An outage supervisor added that restructuring had influenced "the way we think about business. [We now] focus on making sure we are at 100 percent for peak periods." And an outage director said that his plant's "costs have been significantly reduced [and] will have to be reduced from where they are now to improve profitability in a deregulated market. The pressure to reduce costs has not been any more than normal, but I expect that to change soon."

Another assistant plant manager commented that his plant wasn't affected by restructuring because his company already focused on reducing outage costs, "so we will be ready for any future business opportunities."

Other respondents dealt with improving outage schedules, doing more jobs cheaply, staying clear of regulatory violations, and keeping workers safe.

Restructuring and sharing

In the new era of a restructured electric power industry, good practices and lessons learned continue to be shared among outage personnel, according to most respondents. In fact, many plant staffers credit restructuring with promoting the exchange of information. "[Restructuring] has increased the need to share information, and from what I've seen, all plants have been more than willing to share," stated an outage director.

That is, of course, except for the sharing of outage start dates and durations, according to a superintendent of plant scheduling. That information, he inferred, must be kept confidential to protect financial standings in the marketplace. In fact, noted one outage manager, one utility appears to be so weary of the restructured industry that it has closed its door on sharing any outage-related information and "has stopped participating in most of the industry peer-group activities." **NW**