

UTILITY WORKING CONFERENCE

New-reactor plans draw more attention

THE UTILITY WORKING Conference (UWC) has established a reputation as the meeting to attend for a clear emphasis on power reactor operation provided by the people and organizations directly involved in it. Even here, however, the prospect of a “nuclear renaissance” and the construction of new power reactors has a growing influence. During the 2007 UWC, held August 5–8 at the Amelia Island Plantation in northeast Florida, four of the 24 technical sessions were specifically devoted to new reactors—never operated, not yet built—and one other session applied to both operating and new reactors.

While the opening plenary session covered general topics that mainly concerned existing reactors, the UWC repeated last year’s Tuesday afternoon all-hands session on expanding the fleet (with new reactors) and added an all-hands interactive roundtable on Wednesday afternoon, also about new reactors. This marked the first time that the conference officially extended past the Wednesday wrap-up luncheon. Last year there was a largely unofficial Wednesday afternoon session on—you guessed it—new reactors.

A more generous interpretation might be that because this is called a utility working conference, and these days a utility might be working on new reactors as well as on operating ones, it could be reasonable for the conference to reflect all nuclear activities at a utility. (The term “utility” no longer covers every possible provider of nuclear electricity, but that is a different quibble.) With an attendance this year of 472—the highest ever for this meeting, breaking the record set last year—the UWC appears to be growing in importance, and so the program choices (new reactors as well as operating) may be reflecting accurately the current interests of attendees.

The theme of the meeting as a whole was “The Future Begins Now,” with a subtext of new reactors (and the need to operate ex-

A gathering long devoted to operating reactors had two all-hands sessions this year on reactors that do not yet exist.

isting reactors well to help make the case for new ones). The theme of the opening plenary session, however, was “Staying Focused,” with a clear message that the prospect of new reactors should not become a distraction from the already-present mission of operating 104 reactors safely and efficiently. If there seemed to be a potential conflict there, it may just be something that the nuclear power community will have to get used to over the next several years: finding ways to keep the current fleet at high overall performance while pursuing new reactors, with all of the demands on personnel, materials, and financing that this situation will entail.

Nuclear Regulatory Commission Chairman Dale Klein, who delivered the first address at the session,



Klein

cadre of owner/operator organizations, and the second line is the Institute of Nuclear Power Operations (INPO). If an issue gets to the third line, the NRC’s resident inspectors at power reactors, “then industry has failed.”

Klein also expressed concern over whether quality can be upheld in components made overseas, and he cited a number of issues already heavily discussed in the nuclear community, such as the rising

demand for skilled personnel. He encouraged the industry to emulate the NRC’s program to use businesses owned by minorities and the disadvantaged in order to increase diversity, and he said that businesses owned by combat and disabled veterans should not be overlooked. To get started, he suggested contacting the Small Business Administration.

The next speaker was K. P. Lau, senior policy advisor of the Senate Committee on Energy and Natural Resources, who summarized the state of nuclear appropriations bills as of early August. (As of that time, there remained a general tendency for the House and its committees to be less willing to meet the administration’s budget request than the Senate and its committees.) He noted that some industry executives have said that it is a myth that the Energy Policy Act of 2005 provided all the legislation necessary for new reactor construction. Lau insisted, however, that Congress has done its share, and the rest is up to the industry and the executive branch.

Michael Kansler, chief nuclear officer of Entergy and president of Entergy Nuclear Operations, surveyed the current state of reactor operations and acknowledged that in the effort to keep up the current condition of high plant capacity and low production costs, there can be a number of distractions—including new reactors. (Entergy is preparing to apply for two combined construction and operating licenses [COL]: one, in cooperation with the NuStart consortium, for a second reactor at Grand Gulf, and the other an Entergy-only project for a second reactor at River Bend.) He said that the current level of operation derives from leadership, but he added that “management

can't lead from an office" and must get involved at plant sites to earn respect. He also stressed the importance of instilling a safety-conscious work environment, with leadership ensuring that concerns raised by employees will get results, not reprisals.

Chris Crane, president and chief nuclear officer of Exelon, said that the most important issue today is to stay focused on what's going on at nuclear plants, and not on what he called the "sexy" nuclear renaissance. He described Exelon's model, employed across its 17-reactor fleet: Standardize



Crane

processes and programs, replicate best practices in the entire fleet, and maintain corporate oversight and depth in technical management. He admitted that as a result, Exelon has a reputation as stern, cold, and pushy, and also that conflict management has not been one of Exelon's strengths. "At times, you can become metric-crazy," he added, but he insisted that metrics are needed in key areas to assess plant performance and indicate where improvements may be needed. In 2006, Crane said, Exelon completed 10 refuelings, averaging a duration of 23 days. He attributed this to the refuelings' being planned 24 months in advance, with 37 milestones to be met.

Asked whether Exelon has applied its management model to the conversion of instrumentation and controls from analog to digital, Crane cited the change control processes used on feedwater I&C and rod position indication at LaSalle. The work was not started until the vendor specifications were in place, and so this job was done differently from the power uprates at Quad Cities, which Crane called a "debacle."

George Felgate, vice president of plant operations at INPO, presented the institute's latest charts of plant performance. He said that the focus on safety by plant staffs appears to be greater now than ever before. There had been worries that utility deregulation would erode safety, but Felgate said that this has not happened. There were 111 significant events at U.S. power reactors in 1992; in 2006, there were six. While performance is good in all areas, Felgate said that the rate of fuel cladding defects is higher than INPO would like, and he said that while this is not highly significant, it is "inconsistent" with the levels of performance elsewhere. Asked later if there were clear causes for these defects, Felgate said that there are multiple factors, with fretting the leading cause in pressurized water reactors, and foreign material exclusion in boiling water reactors, but neither cause is overriding. He said that he likes the Electric Power Research Institute's goal of engag-

25 IMPORTANT EVENTS IN TRAINING

	Location	Date	Description
1.	Browns Ferry-1	March 1975	Fire results in the loss of safety-related components
2.	Three Mile Island-2	March 1979	Loss of coolant accident with major fuel damage
3.	Browns Ferry-3	June 1980	Control rods fail to insert following a scram
4.	Salem-1	February 1983	Reactor trip breakers fail to actuate
5.	ANO-1	September 1983	Improper control rod recovery leads to fuel damage
6.	Connecticut Yankee	August 1984	Reactor cavity seal failure
7.	Oyster Creek	December 1984	Fuel failures due to improper power changes
8.	Davis-Besse	June 1985	Loss of main and auxiliary feedwater
9.	Chernobyl-4	April 1986	Reactor explosion
10.	Surry-2	December 1986	Feedwater line rupture
11.	LaSalle-2	March 1988	Scram following neutron flux oscillations
12.	McGuire-1	March 1989	Steam generator tube rupture
13.	Vogtle-1	March 1990	Loss of shutdown cooling due to switchyard work
14.	Palo Verde-2	March 1993	Steam generator tube rupture
15.	Millstone-2	August 1993	Repeated sealant injections to repair an unisolable primary system valve
16.	Salem-1	April 1994	Reactor scram and safety injection following marsh grass blockage of intake
17.	Limerick-1	September 1995	Stuck open safety relief valve and subsequent RHR suction strainer fouling
18.	Catawba-2	November 1995	Loss of inventory while at reduced inventory
19.	Clinton	September 1996	Continued plant operation with excessive recirculation pump seal leakage
20.	Zion-1	February 1997	Reactivity mismanagement during a shutdown
21.	Calvert Cliffs-2	April 1997	Unplanned radiation exposure while diving in the spent fuel pool
22.	Tokai	September 1999	Criticality accident at uranium processing plant
23.	Davis-Besse	March 2002	Undetected leak and degradation in the reactor vessel head
24.	Paks	April 2003	Severe fuel damage external to the reactor due to loss of cooling
25.	Mihama-3	August 2004	Condensate system pipe rupture resulting in five fatalities

(Source: INPO)

ing fuel vendors to find the causes of the defects and work to eradicate them.

Felgate noted that while the scram rate remains better than INPO's goal for the industry, it has risen somewhat since the best-ever rate achieved in 2005 and appears to be related to equipment problems, not human performance. Also increasing, Felgate said, are grid and transformer problems. On the workforce issue, he said that about 12 plants are now struggling to obtain enough personnel, and he noted that there are now about 100 vacancies for trainers over the whole fleet. INPO has also lately found weaknesses in emergency planning, Felgate said, and a new review section has been set up in this area.

In summary, Felgate stressed the impor-

tance of learning the lessons of the past, but he said that with the INPO database now including 122 000 events, who could study all of them? He then showed a slide listing 25 events that he considered essential. While noting that other people might select different events, he said that careful study of these 25 would give some advance warning of potential operational problems.

Generic issues

Jim Dyer, director of the NRC's Office of Nuclear Reactor Regulation (NRR), introduced the session on generic issue resolution by noting that a similar session at last year's UWC never really finished, and so it was being resumed this year. For some of the attendees, who have seen some generic

issues linger for years awaiting resolution, this may have seemed appropriate.

Mike Case, director of the Division of Policy and Rulemaking in NRR, said that generic issues have value, like green findings in the reactor oversight process at individual reactors. He said that if an issue is not resolved within about six months, there is something wrong, and he cited the resolution of the issue of dissimilar metal welds as an example of the process working well. He noted that there are no new bulletins and only one generic letter under development (gas intrusion); at times there have been as many as 10 generic letters in various stages of completion. Case said that he considers the writing of generic letters to have improved, with more advance planning by the NRC on what to do with the information sought by the letters when the licensees deliver it.

William Horin, a partner in the law firm of Winston & Strawn, was less upbeat about the process, suggesting that the Committee to Review Generic Requirements is too passive, when it should be challenging the NRC staff on proposed actions or information requests that would be included in generic letters. Asked by Case to elaborate, Horin said there have been times when resident inspectors have demanded conformance to information notices, which in legal terms have no regulatory weight.

The next speaker was Alex Marion, executive director for nuclear operations and engineering at the Nuclear Energy Institute. While taking (understandably) a pro-industry position on whether some NRC actions on generic issues can lead to extra burdens on licensees without the formal process of rulemaking, he did say that licensees should not continue to cling to the original 30-plus-year-old licensing bases of their plants in cases where new information and advanced technology render these bases irrelevant. He encouraged both the NRC and licensees to focus on what really matters now at operating plants.

Pamela Cowan, mid-Atlantic licensing director for Exelon, suggested the use of a collegial forum for the resolution of generic issues. Returning to a point brought up by Horin, she said that inspectors sometimes come up with varying interpretations at individual plants, and she envisioned the creation of a forum such as the NRC-industry Reactor Oversight Process Working Group to avert such inconsistencies in interpretation. She added, however, that this generic issues forum should not deal with licensing matters, which she thinks would probably be too complex for this approach.

After the scheduled speakers were finished, the session was opened to a general discussion, with F. X. Cameron of the NRC staff acting as a "facilitator," listening for key points and writing them on an easel pad with a thick marker. The first point to

emerge was that the NRC and industry may not be in basic agreement on the goals of generic issue resolution, or even on the meanings of the terms being used. In response to the numerous assertions that individual NRC officials give differing interpretations, Dyer said that there should be only one NRC, and if individuals in the agency interpret things differently, the NRC has to fix that.

There was some further discussion of Cowan's suggestion of a collegial forum. She said that if someone on the NRC staff (such as a resident inspector) wanted to take an action on a generic issue, that action would first be referred to the forum, which would either work out a consensus approach or request technical expertise from NRC headquarters to provide input. Case said, however, that if action is seen to be necessary at a specific plant, it should be taken before the end of the next refueling outage. If an issue is referred to a forum, it might not be resolved soon enough. Cowan said that the forum would meet monthly, and it should be possible for issues to be resolved promptly. (The discussion on this and other generic issues was to continue at another meeting in October. Unlike at last year's UWC, this year's generic issue discussion was believed to have made progress, and the October session had already been planned.)

Managing temporary changes

If there was a common thread to the presentations and audience comments at the session on the management of temporary changes to plant configuration, it was that chemistry departments seem to make such changes without properly informing other departments and then either leave their changes in place or do not fully restore the system after their changes are removed. In order to obtain samples, which are later analyzed to provide information on the concentration of various substances in cooling water at different plant locations, chemistry technicians sometimes install drain valves. Attendees said that sometimes, when the sampling is done, it is left to other departments to remove the valves or restore the permanent valves to their proper positions—once the change has been discovered.

David Hembree, INPO's manager of engineering/configuration management, drew a distinction between temporary modifications (TMOD) and temporary alterations in support of maintenance (TASM). (These are INPO designations; each licensee has its own terminology.) He said that a plant's engineering department should lead the way in keeping track of modifications, and in later restoration. Hembree said that INPO has found that lack of oversight is the primary cause of problems with TMODs. With TASMs, the primary cause

is lack of tracking and monitoring.

Rick Mella, design electrical and I&C engineering supervisor at Nuclear Management Company's Prairie Island, said that at his plant there are three types of temporary configuration changes: TMODs, bypasses, and engineering evaluations. A bypass is any device that blocks an out-of-service component or prevents the component from performing its function (such as a gag on a relief valve). Engineering-evaluation changes generally do not affect the existing configuration but may change its loads (such as scaffolding or temporary shielding). Mella called bypassing "a legacy process" carried over from earlier years, and one that he expects to evolve into a clearer designation of the work itself, such as surveillance testing or equipment out of service.

Temporary modifications must be carried out in conformance with 10CFR50.59, the regulation that governs changes, tests, and experiments. Gabriel Gardner, civil design supervisor at Nebraska Public Power District's Cooper station, also cited the relevance to the process of 10CFR50.65(a)(4), the passage in the maintenance rule on risk assessment to be carried out before maintenance work is begun. Gardner said that a new steering committee was created as a result of self-assessment of temporary changes at Cooper, and this committee is working to improve the criteria used in the screening of TASMs to ensure that the modifications apply directly to the planned maintenance work.

Jim Porter, manager of design engineering at Florida Power and Light Company's St. Lucie plant, used the term "temporary system alteration" (TSA), with the purpose of maintaining configuration control while ensuring that reviews and approvals are obtained. Among the lessons learned from his staff's work on TSAs, he cited the importance of periodic training and communication (mentioning chemistry-related changes that could go unobserved), the need to consider TSA impacts on procedures, and awareness that barrier breaches (open doors, HVAC pathways) are alterations also.

New reactors

While our coverage of this meeting seeks to emphasize work being done in connection with the operation of existing reactors, the growing emphasis on new reactors makes it necessary to note the sessions in this area as well—especially the two all-hands sessions. Here are some of the noteworthy points made during those sessions:

- Expected applicants for COLs have tried to work out what can be done at a plant site without permission from the NRC, what would require a limited work authorization (LWA) from the NRC, and what could be done only after a COL has been issued. At the session on pre-application interactions

for new reactors, the following general guidance was given by David Matthews, director of the division of new reactor licensing in the NRC's Office of New Reactors: If you dig a hole, you don't need an LWA, but if you put something in the hole that will stay there, you do. He added, however, that the hole will be studied closely later under the inspection, tests, analysis, and acceptance criteria reviews that come after COL issuance and before startup permission is granted.

■ Representatives of two of the COL applicants for Westinghouse AP1000 reactors—Buzz Miller, Southern Nuclear Operating Company's senior vice president for nuclear development, and Brew Barron, Duke Energy's chief nuclear officer—spoke at the session on expanding the fleet. Miller gave details about the Georgia Public



Barron

Service Commission's decision that Southern must take bids for new capacity, rather than just go ahead with the reactors it plans for the Vogtle site. Because of this competitive situation, he stated the pricing situation for Westinghouse:

"We're going to get a price that works . . . or we're not going to [build reactors]." Barron was later asked whether Duke would look at the price given to Southern and ask Westinghouse for the same treatment, but he said that price was not Duke's only consideration; the negotiations with the reactor vendor also cover areas such as damages and guarantees.

■ The writing of COLs is a mammoth undertaking that produces enormous documents that must then be meticulously reviewed. At the interactive roundtable on new reactors, George Zinke, Entergy's manager of quality assurance and licensing for new plants, admitted that it is hard to find anyone who has read and fully understands all of an 800-page rule. NuStart President Marilyn Kray said that her consortium had to complete its COL applications before the final revisions to 10CFR52 had been published.



Kray

(The final version was published three weeks after the UWC.) She said it would have been preferable to have waited until all of the final federal documents were delivered, read, and well understood, but the licensing time frame

for the first COLs is already perceived to be a long one without adding on another waiting period.—E. Michael Blake **■**