

**A Report from the 2002
ANS Annual Meeting in
Hollywood, Florida.**

D&D Dollars

D&D Expenditures Versus Cost Estimates

A technical session on Comparison of Decommissioning Expenditures Versus Cost Estimates at the 2002 American Nuclear Society (ANS) Annual Meeting (held June 9–13 in Hollywood, Fla.) looked at current expenditures at a number of commercial nuclear power plant decontamination and decommissioning (D&D) sites around the country. The session was organized by Lynne Goodman, of Detroit Edison, and sponsored by the Decommissioning, Decontamination, and Reutilization Division of ANS.

Trojan

Mike Lackey, from Portland General Electric (PGE), reported that while cost estimates for decommissioning the Trojan plant are up from the original 1994 estimate of \$401.5 million (in 1997 dollars) to about \$424.6 million today, the plant's collections are still adequate. PGE has not had to raise rates for customers, he said. The utility got 100 percent of its collections in the first rate case and has not had to raise or lower it since. (These costs do not include the costs of operating the spent-fuel storage pool while the fuel remains in it, Lackey added. Those costs are considered operating costs, not decommissioning costs.)

The utility saved some \$25 million from the original estimate on the reactor vessel budget, Lackey reported, because the estimate included internals removal. As is pretty well known by now, Trojan did not have to remove the vessel internals; instead, in August 1999 the utility was able to ship the vessel, internals in-

tact, up the Columbia River to the Richland, Wash., low-level waste disposal site. (See "Cruisin' Up the River: The Final Journey of the Trojan Reactor Vessel," *Radwaste Magazine*, Nov./Dec. 1999, p. 48.) "That's the way the industry should go," Lackey continued. "If there's anything we can do as an industry for

project is to free release some material that later is found to be contaminated," he explained. "It's a risk management issue. Free release is just too time-consuming and too risky." Instead, some 25 million pounds of noncontaminated concrete was sent to Duratek and buried in a Tennessee landfill under the "Green Is Clean"

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the next generation of plants, it's finding a way to dispose of these vessels intact."

Other D&D costs came in above the estimates, Lackey said. For example, the surface decontamination work has come in about \$10 million over budget, primarily because the utility changed approaches in the middle of the work, removing all containment concrete instead of surface scabbling it. This is due to ongoing characterization work, Lackey explained. "Characterization is an ongoing process. You get some surprises."

The radwaste budget also increased (up by about \$12 million), driven by the increase in disposal quantity (of the concrete). "It's hard to free release this material," Lackey said, so the utility ended up sending more waste to disposal. "The quickest way to shut down your decommissioning

program; the rest was sent to the Richland LLW disposal facility. "You can beat any costs you would incur trying to free release material either at the Envirocare of Utah facility or at Green Is Clean sites," Lackey said.

One other major source of cost increases was the independent spent-fuel storage installation (ISFSI), which is coming in around \$42 million over budget. This was due primarily, Lackey said, to the problems the utility had with the original casks, which set the project back a couple of years and added markedly to the costs. In response to a question from the audience about added security for the ISFSI in the wake of the terrorist attacks on September 11, Lackey said that originally they had planned to have two guards around the clock, but now he believes that number might go up to five or six. That would add about \$1 million per year to the

ISFSI costs, but he said he thinks the current funding can handle it.

lump sum contract. Second, a single-unit utility has little incentive (other

as mandated by the Nuclear Waste Policy Act).

Increasing ISFSI security would add about \$1 million per year to Trojan's costs, but the current funding should be able to handle it.

When the D&D work at Trojan is finished, Lackey said, the turbine building will remain standing. The utility will take that down when it takes down the ISFSI (sometime in the 2018 time frame, assuming that a spent-fuel/high-level waste repository opens on schedule and Trojan can ship its fuel to the repository).

Yankee Rowe and Connecticut Yankee

Clay Melin, from Yankee Atomic Electric Co., reported that the latest D&D cost estimates for Yankee Rowe are \$453 million and for Connecticut Yankee (CY) are about \$496 million (in 2002 dollars). The following are among the lessons learned that he reported:

- An accounting system oriented to construction rather than operations is more suitable for tracking D&D costs.
- Early cost estimates must adequately assess the costs of addressing stakeholder concerns. The concerns of federal, state, and local regulators and other "interested parties" had to be taken into consideration. At the local level, he noted, environmental concerns and property taxes were key issues.
- Changing conditions both on- and offsite can affect cost estimates dramatically. Offsite, there is the problem of LLW disposal facility uncertainty. Also, the September 11 events have affected the level of security needed around the spent-fuel pool and the ISFSI, adding to costs. Onsite, finding polychlorinated biphenyls (PCBs) in paint has increased the mixed waste volume.

However, he said, the two utilities have not done detailed cost comparisons for several reasons. For one thing, lump sum contracts with decommissioning operations contractors can result in a decrease of detailed cost information that could be put in a database. Contractors are reluctant to share cost information in a

than good will) to share data. Plus, Melin added, there is always the danger that erroneous information will be released, possibly affecting later rate cases. In summary, he said, there is just little incentive for these utilities to do actual-to-estimate cost comparisons.

In response to an audience question, Melin said that there have been meaningful savings because the two utilities are sharing resources. The two utilities have about a dozen shared employees, he said, and those employees working on projects at Yankee Rowe (for example, in the fuel transfer) can bring what they've learned back with them to CY.

Accounting

Many of the points made by the two earlier speakers were reinforced by Geoff Griffiths, from TLG Services, which specializes in D&D cost estimating. The company had done many D&D cost estimates in the 1990s, a time when it appeared that some 25 percent of operating plants would be decommissioned because of costs. But the market changed dramatically, nuclear power plants are

Griffiths noted that doing cost estimates is a very difficult job, because some of the necessary data just are not available. For instance, most decommissioning projects don't spend the time to prepare and show data in a useful format to aid in future cost estimates because it simply is not in their interest to do so. One major reason is that cost tracking systems that have been set up don't track well with the utility's basic accounting system. But there are other reasons as well.

Jim Rang, speaking from the audience, noted that while he was at Big Rock Point, the plant staffers tried to mesh some data they wanted to track with the corporate accounting system but found it almost impossible to do so. When they tried to suggest some changes in the accounting system, it was "like moving mountains," Rang said.

Also speaking from the audience, Mike Lackey added that having data that compare too easily can backfire on a utility, because if the state Public Utility Commission looks at other project estimates, it may accuse a utility of underperforming and disallow costs.

On the other hand, Griffiths said, the DOE seems to "have a major industry" of estimating/tracking/revising/reporting decommissioning costs. "It's almost like the tail wagging the dog," he said, and the DOE "goes off the deep end" in this area.

Big Rock and Fermi-1

Lynne Goodman reported on cost revisions at Big Rock Point (using

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going for extended licenses, and TLG now is finding itself more involved in estimating costs for lawsuits against the U.S. Department of Energy (for not taking title to spent fuel in 1998

data sent to her by the plant) and Fermi-1, where she is in charge of decommissioning. At Big Rock, cost estimates have risen from \$325 million made in 1997 to \$400 million today

(both in 2000 dollars). Major changes came in the areas of core staffing (the utility underestimated the staffing needs), in the costs of dry fuel storage (almost a \$40 million increase), and in waste disposal costs (up some \$20 million), because assumptions were made with little characterization data to back them up and because the plant is now planning to dispose of steel, not recycle it.

At Fermi-1, which, Goodman said, is undergoing its second decommissioning (the first, in the 1970s, resulted in most contaminated components being sent offsite),

eration. The \$4 million yearly budget at Fermi-1 is allocated roughly as follows: \$1 million for staff, \$1 million for asbestos abatement, \$1 million for contractors, and \$1 million for sodium work. The utility hopes to get the license terminated in 2007 and to begin tearing down the building in 2008.

Regulations

Mike Ripley, from the U.S. Nuclear Regulatory Commission, said from the regulatory agency's standpoint, cost estimates provide a basis for assuring that utility decommis-

generic, comparison, site specific); a site-specific estimate must be submitted later.

- Within two years prior to license termination, with the License Termination Plan (LTP).

Trojan is the only decommissioning plant with an approved LTP right now. And they were forced to provide the NRC with incredibly detailed cost data, Ripley said. However, the NRC is now "stepping back" from that request, he added.

Commenting from the audience, Geoff Griffiths noted that the NRC uses *volume* of LLW to give an estimate; the real world uses *pounds*—Barnwell charges by the pound, waste processors charge by the pound—so volume is not an accurate measure. He suggested that the agency change its measurement methodology. And Jim Rang noted that next-generation plants will have fewer components and asked if the NRC has begun to think about the fact that those plants will have lower commissioning costs as a result. In response, Ripley said the NRC has no plans to change its formula now.—
Nancy J. Zacha, Editor ■

A single-unit utility has little incentive (other than good will) to share data.

the partial estimate for the current scheme of work is \$34 million. Sodium-related components cost more to decommission and decontaminate, Goodman noted, but in compensation, she added, there is less contamination in the rest of the plant, since leaks were less tolerated during op-

tioning funds are adequate to complete decommissioning. Therefore, decommissioning cost estimates must be submitted to the NRC at several stages:

- About five years before shutdown.
- Within two years following shutdown (can be one of several types: