

Yucca Mountain Updates

- The U.S. Environmental Protection Agency has proposed a million-year radiation protection standard for the Yucca Mountain high-level waste/spent fuel repository in Nevada. The two-tier standard would limit doses to 15 millirem per year for the first 10 000 years, and 350 mrem per year for the next 990 000 years. A federal court had remanded the EPA's original 10 000-year, 15-mrem standard last year because the standard did not address the time period beyond 10 000 years. The U.S. Department of Energy, which is designing the repository, estimates that the peak radiation dose would reach about 150 mrem per year some 400 000 years after the repository is sealed.
- Nevada has incorrectly used U.S. Department of Energy oversight funds for work unrelated to the repository project at Yucca Mountain, according to a DOE Inspector General (IG) report. Oversight funds are supposed to be used for monitoring testing, or evaluation of activities associated with work at Yucca Mountain, but the IG reports that some of the money was used for economic development expenses, official travel unrelated to nuclear waste, and monitoring of the Nevada Test Site, a former nuclear weapons testing site near Yucca Mountain. The report can be found on the Internet at <http://www.ig.doe.gov>.
- The U.S. Department of Energy most likely will not submit an application for a repository license to the U.S. Nuclear Regulatory Commission until March 2006 at the earliest. This information was derived from the DOE's August monthly status report to an NRC licensing board. The application will not be submitted until at least six months after the DOE certifies that it has loaded all of the relevant repository-related documents onto the Licensing Support Network (LSN), an Internet-based data bank that can be used as a tool for discovery during licensing proceedings. That certification has most likely now slipped from earlier estimates of late August well into September. At press time, the DOE had not said exactly when it expects to make the certification.
- Joseph Hevesi, the U.S. Geological Survey (USGS) scientist who wrote many of the e-mails published earlier this year suggesting that some quality assurance documents related to the Yucca Mountain project may have been falsified, testified before Congress in late June that he has never falsified any documents related to the repository project. He characterized his e-mails as containing "off the cuff" remarks, but added that they did not mean he falsified either QA documents or scientific data.
- In June, the Western Governors Association passed a resolution giving support for safe geologic disposal of commercial spent nuclear fuel and high-level waste, but urging

the U.S. Department of Energy to work with states in the development and implementation of a plan to safely store, transport, and dispose of it. The resolution, cosponsored by Nevada Gov. Kenny Guinn, did not mention Yucca Mountain by name, although it was clearly aimed at that repository program. The resolution also supported the rights of states, tribes, and local governments to have a say in the selection of shipping routes, and also supported efforts by the federal government to study alternative waste management options, including extended storage at reactor sites.

GAO: DOE Needs Better Performance Reporting to Achieve Accelerated Cleanup Goals

In an analysis of the U.S. Department of Energy's accelerated cleanup program, announced in February 2002, the U.S. Government Accountability Office (GAO) gave the DOE a mixed review. In "Better Performance Reporting Needed to Assess DOE's Ability to Achieve the Goals of the Accelerated Cleanup Program" (GAO-05-764, July 29, 2005), the GAO noted that the DOE was on track or ahead of schedule for many of the 16 cleanup activities it measures, including packaging nuclear materials for disposition, disposal of low-level radioactive waste, and removing buildings. However, the DOE was behind its accelerated schedule for three challenging and costly activities: disposing of transuranic and radioactive tank wastes and closing tanks that had contained radioactive wastes. These three cleanup activities had technical programs, the GAO noted, such as developing waste separation technology, or regulatory issues, such as determining when a storage tank is clean enough to close. In addition, the GAO said, the DOE has had problems with other treatment and disposal activities not reflected in its performance measures, such as delays in shipping plutonium from sites, resulting in additional costs to secure and store the material.

According to the report, the DOE is not likely to achieve the full \$50 billion estimated cost reduction—a key goal of the accelerated cleanup plan. The report said that the DOE's method of calculating the reduction probably overstated the potential reductions, that the reductions were estimated on assumed improvements that are highly uncertain, and that, indeed, some key sites were experiencing cost increases, not decreases, as the DOE had planned. Because of these problems, the report noted, the DOE no longer cites its \$50 billion estimate, although it still expects to achieve some cost reductions.

The GAO recommended that the DOE (1) improve the linkage between performance measures so that there is a

clearer, discernable relationship between how much clean-up has been accomplished and costs incurred in doing the work, and (2) identify and highlight in its progress reports to the Congress and others those performance measures (such as preparing radioactive tank waste for disposal) that are the most critical to assessing overall progress toward meeting accelerated cleanup plan goals.

In comments on the report, the DOE agreed with the GAO recommendations. The full report is available at the GAO web site, <http://www.gao.gov>.

Low-Level Waste in the News

- In early August, the state of Nebraska paid the \$145.8 million judgment to the Central Interstate Low-Level Radioactive Waste Commission. It was the largest single payment ever made in the state, amounting to about \$83 for each Nebraska resident.

The judgment came after the Central Interstate Compact Commission selected Nebraska as the host state for a low-level waste disposal site in 1987. Two years later, the compact and its developer, US Ecology, chose a locate outside of Butte in Boyd County. But in 1998, Nebraska denied US Ecology a license to build and operate the site. The compact sued Nebraska and state officials, including former Gov. Ben Nelson, for acting in "bad faith." U.S. District Court Judge Richard Kopf agreed and awarded the \$145 million settlement.

The money is being distributed as follows among nuclear utilities and other entities: Entergy Arkansas, \$23.6 million; Entergy Gulf States, \$19.8 million; Entergy Louisiana, \$18.4 million; Nebraska Public Power District, \$18.4 million; Omaha Public Power District, \$15.4 million; Wolf Creek Nuclear Operating Co., \$18.9 million; US Ecology, \$11.8 million; states that contributed to a community improvement fund, \$4.2 million. The compact will retain \$15 million and will decide later what to do with the funds. In addition, there is a \$4 million claim from the village of Butte, which the compact commission is looking into.

Nebraska is no longer a member of the compact.

- US Ecology will continue to operate the low-level waste disposal facility on the Hanford reservation, having entered into a renewable 10-year sublease agreement with the Washington Department of Ecology. Sublease terms include four 10-year renewal options and an annual, inflation-adjusted rental payment of about \$63 000. The facility opened in 1965.

NAS National Research Council Supports Linear No-Threshold Model

A new report from the National Academies of Science's National Research Council supports the linear no-threshold (LNT) model of radiation health effects. The report, released June 29, was prepared by the Committee on the Biological Effects of Radiation (BEIR). The report, the seventh in a series that addresses the health effects of humans to low-dose ionizing radiation, states that the committee's review of available biological and biophysical data supports the LNT risk model, which says that the smallest dose of low-level ionizing radiation has the potential to cause an increase in health risk to humans. The report noted that some researchers have said the LNT model exaggerates adverse health effects, which others said it underestimates them.

The report focuses on new information available since the 1990 BEIR V report, saying that the availability of new and extensive data have strengthened confidence in earlier risk estimates for solid cancer and leukemia. The committee's review included an examination of updated cancer-incidence data from tumor registries of the survivors of the atomic bombings in Japan, and also looked at research on solid cancer deaths. The data are more abundant because the number of deaths available for analysis has nearly doubled since the 1990 report.

The report said the BEIR committee believes that it is unlikely that a threshold exists for the induction of cancers, but that the occurrence of radiation-induced cancers at low-doses will be small. It also said that additional data must be gathered before an assessment can be made between low doses of radiation and non-cancer health effects (such as stroke or heart disease).

The full report can be found on the NAS web site at <http://www.nas.edu>.

Congress Passes, President Signs Energy Bill

After several years of effort, President Bush finally got to sign an energy bill. While the Energy Policy Act of 2005 does nothing to alleviate short-term gasoline prices (which is what many members of the public probably hoped for), it does provide funding for such long-term projects as research on hydrogen fuel cells and promotes greater use of ethanol and hybrid vehicle technology.

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What the nuclear industry has been most interested in, however, has been in the provisions for future nuclear plants. The Act provides for loan guarantees, risk insurance, and tax credits for companies venturing to build a nuclear power plant in the future. However, according to an analysis by Craig Piercy, of the American Nuclear Society's Washington Office, the Act contains "little specific direction in policy areas like long-term [spent fuel] storage, reprocessing, and the production of hydrogen." Energy policy development does not end with the passage of a bill, Piercy stated.

These issues, and others such as revising the radiation standard for Yucca Mountain and centralized interim spent fuel storage, remain to be dealt with by Congress in some other fashion, Piercy noted. Indeed, the House of Representatives' Energy and Commerce Committee was expected to begin work on legislation this fall to give the DOE waste program greater access to the Nuclear Waste Fund.

Regulatory Updates

- The U.S. Nuclear Regulatory Commission will participate only as a commenting agency during the U.S. De-

partment of Energy's development of an environmental impact statement for a disposal facility for greater than Class C (GTCC) waste, as commissioners rejected a staff recommendation that the NRC become a cooperating agency on the project. The DOE has the responsibility for disposing of the GTCC waste, while the NRC would license a disposal facility. The commissioners stated that they wanted to avoid any perception that the NRC is not acting in an independent regulatory manner.

- The U.S. Nuclear Regulatory Commission issued a notice of violation, but no civil penalty, to Entergy for its failure to keep track of two spent fuel rod pieces at the Vermont Yankee plant. The NRC said that plant inventory records failed to reflect where the pieces were in the spent fuel pool. The two pieces were discovered missing in March 2004, and not found until four months later in a different part of the pool than was indicated in plant records. However, the NRC said, because the spent fuel rod pieces never left the pool, there were no safety consequences.

- New orders for spent fuel transport security measures have been issued to power and research reactor licensees, but because the orders contain safeguards information, they

have not been publicly released. Some of these additional measures may have already been implemented, the U.S. Nuclear Regulatory Commission noted, and other measures may not be possible or necessary for all shipments, or may need to be tailored to a specific shipment need.

International Briefs

- Russia might be able to store spent fuel from between five and seven countries at a facility at some location, most likely at Zheleznogorsk, according to Rosatom head Alexander Rumyantsev, speaking at a July conference on multilateral approaches to the nuclear fuel cycle. But a representative from the International Atomic Energy Agency, which cosponsored the conference with Rosatom, cautioned that discussions on such a system are at an early stage.
- Australia has selected three sites in the Northern Territory as potential sites for a low- and intermediate-level radioactive waste disposal facility for commonwealth wastes. Two sites are near Alice Springs, and the third is near Katherine. About 3500 cubic meters of commonwealth LLW currently exists in the country, and 45 more cubic me-

ters are added each year; 50 cubic meters of ILW also need disposal. The new facility is due to start operating in 2011. Along with wastes from various government agencies, the facility would also receive waste from Australia's only reactor, a research facility at Lucas Heights in Sydney.

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- In a July referendum, the Hungarian settlement of Bataapati approved the construction of a disposal facility for low- and medium-level radioactive waste. Of the 249 votes cast,

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225 were in favor of allowing the construction of the facility, 23 were against, and one vote was invalid. The Hungarian radwaste agency Puram has been investigating a granite formation near the settlement since the mid-1990s, and the Hungarian Geological Survey declared the site suitable for LLW disposal in 2003. The agency plans an underground repository at a depth of about 300 meters.

- The United Kingdom Nuclear Installations Inspectorate has approved the decommissioning of the four-unit Calder Hall plant, the country's oldest magnox station. Located at the Sellafield site, the plant operated for 47 years before its shutdown in March 2003.

Also in the U.K., the country's new Nuclear Decommissioning Authority has published a draft plan for cleaning up the U.K.'s 20 civilian nuclear sites. The focus of the plan is the higher hazard legacy facilities at Sellafield and Dounreay and the accelerated cleanup of the magnox reactors. The draft plan also discusses the need for new solutions for low-level waste disposal and the evaluation of options for intermediate-level waste disposal. The full plan can be accessed on the Internet at <http://www.nda.gov.uk>.

- A draft proposed national waste management plan for France has been released, and France's waste policy de-

bate was due to begin on September 12. The debate on options for managing high-level and long-lived radioactive wastes will open with public hearings near sites in eastern France, the Rhone valley, and the Marche departement in Normandy (mostly likely near Bure, Marcoule, and La Hague, respectively). In addition, three debates will be held in Paris in October, and in December, three further hearings will take place in Dunkerque, Toulouse, and Blois. The French public can comment on the draft plan until the end of the year.

France's parliament is due to vote on a future waste policy in 2006, although Industry Minister Francois Loos has said that a final decision on a waste strategy will not come for another decade, and that next year's vote is only a "stage" in the decision process. The draft plan was posted on the Internet at <http://www.asn.gouv.fr/domaines/dechetsnuc/PNGDRMV.pdf>. A second version of the plan incorporating public comments is expected to be prepared next year and presented for parliamentary action as part of the national waste policy bill.

- Increased radioactivity from cesium-137 has been found in the drainage water from Sweden's low- and medium-level radioactive waste repository. The facility

is located between 160 and 400 feet in bedrock in a cavern that extends under the Baltic Sea. Last spring, the amount of radioactivity in the drainage water increased tenfold (from 250 bequerels per kilogram to 2500). According to facility operator Swedish Nuclear Fuel and Waste Management Co. (SKB), the contamination came from water coming into contact with corroded drums in which the waste is stored. While the discharge is still well below regulatory limits, the company is addressing the problem by first building a roof over the storage areas. Eventually the storage cavern will be covered with concrete so that water cannot come in contact with the waste. SKB is also developing a spent fuel repository in Sweden.

D&D Updates

- In mid-August, CH2M Hill completed the retrieval of radioactive and chemical waste for a third underground storage tank on the U.S. Department of Energy's Hanford Site. The tank, known as C-202, is one of four 55 000-gallon tanks located in "C Farm." When waste retrieval began in June, the tank held approximately 1400

gal of solid material. The tank was one of the original waste tanks built during the Manhattan Project. The tank remained in active service until 1953. Liquids were removed from the tank in 1981, but solid materials remained behind. Retrieval of the waste was accomplished with the use of innovative vacuum retrieval technology. (See "T(h)anks for the Technology," *Radwaste Solutions*, July/August 2005, p. 18.)

- Deinventory and deactivation work in the Savannah River Site F Area took a major step forward this summer when the last container of Depleted Uranyl Nitrate (DUN) left the area, marking the last DUN Shipment from SRS. In total, 132 379 gallons of DUN were shipped out of F Area over about a year's time.

DUN was one of many materials in F Area that needed to be dispositioned. For many years, the material had been stored in liquid form in tanks and other containers. While F Canyon was still running, the material was used in the canyon processes. Now that the facility is shut down, SRS has no further use for it. The DUN has been sent to Materials and Energy Corp. in Oak Ridge, Tenn., where it is being solidified and then sent to the Nevada Test Site for disposal. ■