

Appeals Court Has No Confidence in NRC's 2010 Waste Confidence Decision

On June 8, the U.S. Court of Appeals for the District of Columbia Circuit vacated the U.S. Nuclear Regulatory Commission's 2010 update to the agency's Waste Confidence Decision, stating in a unanimous decision that the Commission must conduct a true environmental analysis regarding the extension of temporary storage of spent nuclear fuel, accounting for the consequences of each risk identified in the analysis. The lawsuit was brought by four states—New York, New Jersey, Connecticut, and Vermont—the Prairie Island Indian Community, and environmental groups. The Nuclear Energy Institute acted as an intervenor in support of the NRC.

The Waste Confidence Decision, first promulgated by the NRC in 1984 in response to the urging of the Court of Appeals in the 1979 *Minnesota v. NRC* decision, included five “waste confidence findings.” Overall, the decision has allowed the agency to finesse the issue of waste disposal when it considers nuclear power plant license issues. The agency has been reviewing and/or updating the decision periodically since it was originally issued in 1984.

The 2010 update was conducted in the aftermath of the current administration's decision to abandon the Yucca Mountain high-level waste repository project. Among other things, the updated decision stated in Finding 2 that a suitable repository will be available “when necessary,” rather than by a date certain, and in Finding 4 changed the amount of time that spent fuel could be stored at nuclear power plant sites from 30 years to 60 years beyond the licensed life of the plant.

According to the court decision, the NRC's evaluation of the risks of spent nuclear fuel was deficient in two ways: first, in concluding that permanent storage will be available when necessary, because the agency did not calculate the environmental effect of failing to secure permanent storage (a possibility that “cannot be ignored,” the court said), and second, in determining that spent fuel can safely be stored onsite at nuclear plants for 60 years after the expiration of a plant's license, because the commission failed to properly examine “future dangers and key consequences.” In a particularly caustic statement on the former issue, the court noted that “The Commission apparently has no long-term plan other than hoping for a geologic repository.” For these reasons, the court said, it was vacating the commission's Waste Confidence Decision and remanding it for further proceedings by the NRC.

While the winning states and environmental organizations immediately declared the decision to be a “game changer,” the consequences of this decision are not immediately clear. The NRC will have to go back and reconsider its update to the Waste Confidence Decision, and some groups are saying that the agency will not be able to issue any new nuclear power plant licenses or any license renewals until the new decision has been reached, because the waste issues would have to be directly addressed rather than finessed with the Waste Confidence Decision. Opponents of nuclear power have long used the lack of a permanent disposal site for spent fuel and high-level waste as a weapon in their opposition to licenses for new plants or license renewals for operating plants.

The Nuclear Energy Institute said that while it was disappointed in the ruling, it was urging the NRC to “act expeditiously to undertake the additional environmental analysis.”

The full text of the court decision can be found in this issue on pages 54–60.

● The NRC is not the only government agency getting chided by the Appeals Court. In response to a lawsuit filed by the National Association of Regulatory Utility Commissioners (NARUC) and the Nuclear Energy Institute (NEI), on June 1 the U.S. Court of Appeals for the District of Columbia Circuit ruled that the U.S. Department of Energy's 2010 assessment of the adequacy of the current nuclear waste fee was “legally defective,” and that the DOE must conduct an assessment, within the next six months, justifying the continued collection of the fee. If the DOE does not meet that deadline, the ruling said, then the court has the authority to suspend the collection of the roughly \$750 million per year that nuclear utility customers pay into the Nuclear Waste Fund.

The Nuclear Waste Fund grew out of the Nuclear Waste Policy Act of 1982, and is designed to fund the development, construction, and operation of a repository for the nation's commercial spent nuclear fuel. Nuclear utility ratepayers contribute one mill—that is, one-tenth of one cent—per kilowatt-hour of nuclear-generated electricity sold. However, with the cancellation of the Yucca Mountain project, NARUC, NEI, and others questioned why the DOE was still collecting the waste fee, given that no repository program now exists, and sued to stop the fee collection. At the end of this year, the waste fund will have around a \$28 billion balance.

Texas Compact LLW Disposal Facility Buries First Waste Shipment

On April 27, Waste Control Specialists disposed of the first shipment of low-level waste sent to the Texas Compact Facility in Andrews County, Texas. The shipment received from Bionomics Inc., consisting of a small amount of medical waste, came a day after WCS received approval from the state regulator, the Texas Commission on Envi-

ronmental Quality (TCEQ), to begin disposal operations at the compact facility. TCEQ leadership was at the site overseeing the first disposal operation, along with TCEQ resident inspectors, who are at the site full-time on a daily basis.

“I am pleased to announce that medical researchers and universities that use radioactive materials everyday to save lives, and nuclear power plants that produce much of our country’s energy needs, are now using a facility specifical-

ly designed, engineered, and constructed to permanently dispose of the low-level radioactive waste that is currently in temporary storage, much of it in urban centers,” stated William Lindquist, CEO of WCS.

“We have finally completed what we set out to do almost 17 years ago, which is to provide the industry with a ‘one-stop shop’ for its hazardous, toxic, and radioactive waste needs,” Lindquist continued.

The facility is licensed to dispose of Class A, B, and C low-level radioactive waste.



Operators for Waste Control Specialists lower the inaugural drum of low-level radioactive waste into a concrete cask for permanent disposal on Friday, April 27, 2012, at the Texas Compact Facility in Andrews County. The cask, known as an MCC, is at the bottom of the disposal facility, where it will remain. The cask is a 10-foot tall, half-foot-thick reinforced-concrete cylinder. As more drums of low-level waste are added, void spaces in the container will be filled with grout and then capped. The Texas Compact Facility features below-grade disposal in concrete-lined cells that are constructed in 600 ft of almost impermeable, natural red-bed clay formations atop a more than 7-ft, state-of-the-art, comprehensive liner system. (Photo courtesy WCS)

Yankee Companies Win \$160 Million in Spent Fuel Lawsuits

The three Yankee companies with decommissioned reactors became the latest nuclear utilities to win a lawsuit against the federal government for the U.S. Department of Energy’s failure to take ownership and possession of the utility’s spent nuclear fuel. In May, the U.S. Court of Appeals granted Maine Yankee \$81.69 million, Connecticut Yankee \$39.66 million, and Yankee Atomic \$38.27 million.

The litigation was originally filed by the three Yankee companies in 1998. In October 2006, the U.S. Court of Federal Claims awarded the Yankee companies roughly \$143 million in damages. The federal government appealed the ruling, and in August 2008, the U.S. Court of Appeals vacated the

2006 decision and sent the case back to the federal claims court.

In September 2010, the U.S. Court of Federal Claims issued another favorable decision, again awarding the three companies \$143 million. The federal government appealed that decision the following November.

This latest ruling reflects a final judgment in the lawsuit, unless the federal government files yet another appeal. Stated Wayne Norton, chief nuclear officer of Maine Yankee and president of Connecticut Yankee: “We are very pleased with the U.S. Court of Appeals decision, which is good news for the ratepayers of the three Yankee companies. We urge the federal government to fulfill its commitment to remove the spent fuel and greater-than-Class C waste from our sites without further delay and to stop pursuing a strategy of filing costly appeals that are not beneficial to ratepayers or taxpayers.”

GAO: NRC Should Risk Inform Natural Hazard Assessments

More than half of the experts cited suggested that the U.S. Nuclear Regulatory Commission should require that its licensees expand the use of probabilistic risk assessment (PRA) for assessing the danger to plant operations from natural hazards (floods, earthquakes, tornadoes, etc.), according to a Government Accountability Office study. The study, “Natural Hazard Assessments Could Be More Risk-Informed” (GAO-12-465, April 26, 2012), was conducted in the aftermath of the March 11, 2011, earthquake and ensuing tsunami that severely damaged Japan’s Fukushima Daiichi nuclear power plant.

The GAO stated that NRC requires licensees to assess natural hazards using deterministic analysis, which, informed by historical experience, test results, and expert judgment, considers a specific set of potential accidents and how the consequences of those accidents can be prevented and mitigated. However, the GAO said, the NRC has also endorsed PRA, a systematic method for assessing what can go wrong, its likelihood, and its consequences, resulting in quantitative estimates of risk, as a means to enhance and extend traditional deterministic analysis. In 1991, the GAO said, the NRC requested that licensees voluntarily examine their reactors’ vulnerability to natural hazards and suggested PRA as one of several possible methods for licensees to use in their examina-

tions. However, most licensees have opted to use other methods, the GAO stated.

The GAO recommended that the NRC Commissioners should direct agency staff to conduct and document any needed analyses to determine whether the agency should require licensees to develop and maintain PRAs that address natural hazards. The NRC said it agreed with the recommendation and stated that it will conduct the analysis in the context of ongoing initiatives.

Among plant systems considered vulnerable to natural hazards are plant spent fuel pools. Concerns about the conditions of spent fuel pools at the damaged Fukushima Daiichi reactors have been considerable since the 2011 earthquake/tsunami. The full GAO report is available at www.gao.gov.

- The Government Accountability Office has also recommended that the U.S. Nuclear Regulatory Commission define what it means by the “bulk” of funds needed for decommissioning in its estimates of licensees’ decommissioning funds. In a report issued in early April (“NRC’s Oversight of Nuclear Power Reactors’ Decommissioning Funds Could Be Further Strengthened,” GAO-12-258, April 5, 2012), the GAO noted what it called “several weaknesses” in the NRC’s ability to ensure that licensees have provided reasonable assurance of financial ability to decommission their facilities. Notable among these weaknesses, the GAO said, the NRC’s decommissioning funding formula may not reliably estimate adequate decommissioning costs because the term “bulk,” as in “the bulk of decommissioning funds needed,” remains undefined. Other weaknesses noted included the lack of written procedures for agency staff who perform two-year fund balance reviews, and the lack of a review of licensees’ compliance with investment standards the agency has set for decommissioning trust funds.

The full GAO report can be accessed at www.gao.gov.

Report: Big Decommissioning Boom Coming . . . in About 20 Years

According to a report from business intelligence experts GlobalData, approximately half of the world’s nuclear power reactors are expected to be closed by 2030 (assuming no life extensions are granted), creating a substantial market for the commercial nuclear reactor decommissioning industry.

Europe will be the location of the bulk of the closures, the report noted, with more than 150 reactors across the region set to shut down as a result of either reaching the end of their life spans or due to prior shutdown plans. Europe will account for nearly 74 percent of the global total and represents \$81 billion in the commercial decommissioning market, the report stated.

The Asia-Pacific region has the second highest decommission market, with a value of some \$20 billion. The North American market, however, will be small, with only \$8 billion in decommissioning work available. This is because, as the report notes, in contrast with the global plant shutdown trend, the United States has granted life extensions to 71 of its nuclear reactors, with more extensions expected in the future.

GlobalData noted that while there is significant profit to be found in the swelling nuclear reactor decommissioning market, the high standards to enter can be prohibitive. Regulatory standards and compliances are strict, so balancing a cost-effective strategy with the necessary safety measures may prove a key challenge, the report concluded.

Regulatory Actions: Foreign Ownership, Uranium Resources

- In June, the U.S. Nuclear Regulatory Commission issued Confirmatory Orders to Connecticut Yankee Atomic Power Co., Yankee Atomic Electric Co., and Maine Yankee Atomic Power to incorporate plans into their licenses to negate the effects of foreign ownership of their companies. The three Yankee companies are all owners of decommissioned nuclear power plants: Connecticut Yankee, in Haddam Neck, Conn.; Yankee Rowe, in Rowe, Mass.; and Maine Yankee, in Wiscasset, Me., respectively.

The companies hold Part 50 licenses for decommissioned nuclear power plants that maintain onsite spent fuel storage facilities. These licenses are subject to NRC restrictions on foreign ownership, control, and domination of nuclear power facilities. Three foreign corporations— Iberdrola, of Spain; National Grid, of the United Kingdom; and Emera, of Canada—share ownership interests through their subsidiaries in the Yankee companies. The combined foreign ownership interest is 74 percent of Maine Yankee, 25.5 percent of Connecticut Yankee, and 44 percent of Yankee Atomic, with the largest percentage of

ownership of one foreign corporation being Iberdrola owning 38 percent of Maine Yankee.

The negation action plans implemented by the Yankee companies are intended to ensure that the partial foreign ownership of the companies does not lead to foreign control, domination, or influence over the companies' decision-making on matters relating to public health and safety, security, or access to classified information.

- The U.S. Nuclear Regulatory Commission has issued guidance allowing uranium recovery facilities to accept, process, and dispose of certain ion-exchange resins used to remove naturally occurring uranium from municipal water systems. The agency noted that the ion exchange resins used in certain water filters are often the same as those used in uranium recovery activities. In this case, they would count as "equivalent feed" and do not require any special license amendment for those facilities to process. The ruling could greatly reduce costs for small community water treatment systems. According to the Environmental Protection Agency, some municipal waterworks can spend up to 50 percent of their operating costs on transport, treatment, and disposal of uranium-bearing resins.

Once the uranium is recovered, the processed resins can be disposed of either in mill tailings impoundments or in low-level waste facilities, or can be put back into service as water treatment filters. The same guidance applies to "equivalent feed" filters from mine dewatering operations, and even filters from other uranium recovery operations, as long as the processing facility remains within the scope of its existing safety and environmental reviews.

"This is a win-win situation, benefitting our national interest by recovering valuable uranium while helping community water systems purify drinking water," noted Mark Santorius, director of the NRC's Office of Federal and State Materials and Environmental Management Programs. "The ability to reuse the resins provides an economic benefit to the treatment facilities by reducing operating costs and the amount of resin requiring disposal."

House Appropriators Support NRC Yucca Mountain License Application Review

In early June, the U.S. House of Representatives approved, with bipartisan support, an amendment to the En-

Industry news ▼

ergy and Waste appropriations bill aimed at forcing the U.S. Nuclear Regulatory Commission to complete its review of the U.S. Department of Energy's license application for operating a spent nuclear fuel and high-level radioactive waste repository at Yucca Mountain in Nevada. The amendment, offered by Rep. John Shimkus (R-Ill.), would move \$10 million from the DOE's administrative account to NRC salaries and expenses, to ensure that the NRC can finish the review. The final vote on the amendment was 326–81.

The amendment is a reaction to the NRC's decision to close out its review of the license application, in the wake of the current administration's decision to cancel the Yucca Mountain project. The Nuclear Waste Policy Act of 1982 and its subsequent Amendment Act of 1987 stipulate that the NRC must complete a review of a submitted licensed application for a repository within three (or four) years of docketing the application.

The U.S. Senate, however, will undoubtedly strip the amendment from their version of the energy and water appropriations bill, given the opposition of Senate Majority Leader Harry Reid (D-Nev.) to the Yucca Mountain project. In the Senate, Sen. Jeff Bingaman (D-N.M.), chairman of the Senate Energy and Natural Resources Committee, is working on forming a nuclear waste bill based on the work of the Blue Ribbon Commission on America's Nuclear Future. Bingaman said he hoped to introduce the bill and hold hearings on it this summer. He said a main focus of the bill will be creating a quasi-government entity to find and develop volunteer nuclear waste sites. Bingaman added, however, that he did not expect Congress to pass such a bill this year—in part, he said, because the House seems more interested in continuing to fight about Yucca Mountain.

D&D Updates

- In Mid-April, Magnox dispatched its final flask of fuel from the United Kingdom's Dungeness A nuclear power plant for reprocessing at Sellafield, completing a five-year program of defueling that has removed 99 percent of the radioactive hazard from the site.

This milestone enables Dungeness to move into a period of focused decommissioning aimed at reaching the “interim care and maintenance” phase by 2019. Two 225-MWe Magnox reactors operated at the Dungeness A site between 1965 and 2006.

At the U.K.'s Chapelcross nuclear plant, fuel has been removed from two of the four reactors, which shut down in 2004. The defueling program there is expected to be completed in July 2013.

- In early May, the U.S. Department of Energy completed cleanup of Cold War legacy transuranic (TRU) waste at Sandia National Laboratories in Albuquerque, N.M., when four shipments of remote-handled waste from Sandia arrived at the Waste Isolation Pilot Plant near Carlsbad, N.M., for final disposal. The Sandia waste shipment campaign was supported by \$1.6 million in American Recovery and Reinvestment Act funding. Sandia becomes the 22nd site in the nation to be completely cleaned of legacy TRU waste.

- The last known irradiated fuel located near the Columbia River at the U.S. Department of Energy's Hanford site has been shipped to the center of the site and put in storage. Some 90 stray pieces of fuel, ranging from a quarter-inch to 26 in. in length, found during various Hanford cleanups had been being stored at the K West Basin, but now these have been moved to the Canister Storage Building in central Hanford until they can be disposed of in a



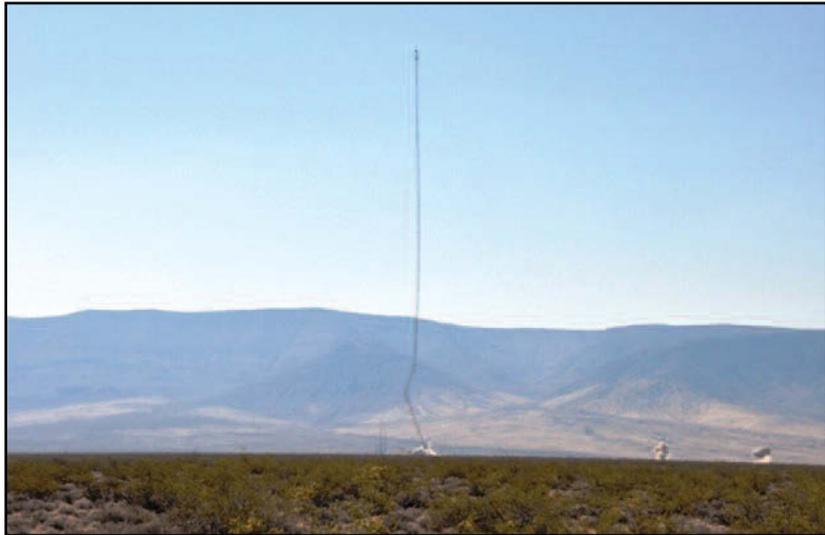
The final flask of fuel from the United Kingdom's Dungeness A nuclear power plant.

final repository. The K West Basin is located only about 1200 feet (less than 400 meters) from the Columbia River.

● The “Bare Reactor Experiment, Nevada” (BREN) tower, the tallest free-standing structure west of the Mississippi, came tumbling down in mid-May in a controlled demolition. The huge tower, taller than the Empire State Building and the Eiffel Tower, was used in the 1960s to estimate radiation doses received by World War II nuclear survivors. It was last used for research in 1999. The demolition of the structure was primarily for safety reasons, as the 1527-foot-tall tower posed a risk to aircraft. It took a little less than 50 pounds of high explosives to bring it down, according to Darwin Morgan, spokesman for the Nevada National Security Site. The event set the world record for tallest structure of its kind ever to be brought down to the ground.

● “Steam cleaning” the subsurface area beneath the Savannah River Site’s M Area has resulted in the removal of more than 33 000 gallons of nonradioactive chemical solvents, preventing these pollutants from entering the local water table. The process, known as “Dynamic Underground Stripping,” involves drilling strategically placed vertical, horizontal, and angled penetrations through 10 million cubic feet of soil located beneath the now remediated M Area pond and injecting millions of pounds of steam. The process increases the temperatures of the solvents to the point where they vaporize. The solvent vapors and some associated contaminated liquids are then vacuumed out of the contaminated area through the use of 33 extraction wells and treated at the surface. It is estimated that the project has accelerated remediation of this portion of M Area by a minimum of 60 years, and has resulted in a cost avoidance of more than \$15 million.

● With the arrival of warmer weather, the search of the seabed near Scotland’s Dounreay nuclear site for nuclear fuel fragments has resumed. In the third consecutive year of full-scale off-shore cleanup, an underwater remotely operated vehicle and a team of workers is detecting and recovering fuel particles. Almost 2000 particles have been recovered from the seabed to date, and of these, nearly 400 were deemed “significant” in terms of their potential health effects. This year’s effort aims to complete cover-



The “Bare Reactor Experiment, Nevada” (BREN) tower before its demolition in mid-May.

age of the 60-hectare plume where significant particles are concentrated, repeat coverage of the most affected areas to recover more particles and to understand better how the higher-activity particles have moved in the sediment, and to gain more information about the spatial extent of the plume and drop-off rates at depth and distance.

● In early June, Bulgaria’s State Enterprise Radioactive Waste applied for a license for the decommissioning of the Kozloduy-1 and -2 nuclear power plants. The company hopes to receive the license in about nine months’ time. The two 440-MWe Soviet-era reactors were shut down in 2002.

● Installation of various pieces of equipment at Hanford’s Waste Treatment Plant (WTP) and the Savannah River Site’s Salt Waste Processing Facility (SWPF) represent key milestones in these two construction projects. At the WTP, the project recently received and installed three nuclear-quality exhausters for its Low-Activity Waste Facility. These six-ton exhausters are key components in a complex air-filtration system that will ensure that the facility’s air emissions meet strict environmental regulations and requirements. At the SWPF, installation of six major nuclear material processing tanks represents a key milestone in this facility’s construction. The newly installed processing tanks will be used for treating radioactive salt waste, a by-product of the Cold War nuclear weapons program currently stored in 47 underground tanks at SRS. A total of 10 processing tanks, ranging in volume capaci-

Industry news ▼

ty from 6000 gallons to 45 000 gallons, will be installed in the facility.

- The cleanup of the former Kerr-McGee Cimarron nuclear fuel plant in Oklahoma will take between five and ten years and has been funded at around \$10 million. Since the plant's closure in 1975, Kerr-McGee and a company called Tronox have been decommissioning the site. Tronox, however, filed for bankruptcy protection in 2009, and in 2011, the site was transferred to the "Cimarron Environmental Response Trust," which is now the holder of the U.S. Nuclear Regulatory Commission decommissioning license. The NRC and Oklahoma's Department of Environmental Quality are the beneficiaries of the \$10 million settlement trust, and Environmental Properties Management LLC has been designated as the trustee of the trust. The goal of the trust is to complete the cleanup of the site to unrestricted release levels. The Cimarron plant gained notoriety in the mid-1970s after the death of former employee Karen Silkwood, a chemical technician at the plant. Silkwood died in a 1974 car accident after investigating claims of irregularities and wrongdoing at the plant.

- In early June, three transuranic (TRU) waste shipments were made on the same day from the U.S. Department of Energy's Savannah River Site using three different shipping containers—TRUPACT-III, RH-72-B, and TRUPACT-II containers. SRS is the only DOE site in which a combination of these three shipping containers is being used. After the trailers were loaded, the trucks traveled nonstop to the Waste Isolation Pilot Plant in Carlsbad, N.M. To date, SRS has safely made more than 1360 shipments of TRU waste to WIPP for disposal.

International Briefs

- Sellafield's Thorp reprocessing plant will stop reprocessing oxide fuel in 2018, the U.K. Nuclear Decommissioning Authority announced in early June, because all Magnox fuel will have been delivered to the site by a year prior to this date. Thorp was originally due to shut down in 2010, but a serious liquid leak in 2005 has extended clo-



Three trucks, each bearing a different type of TRU waste container, get ready to leave the Savannah River Site, heading for the Waste Isolation Pilot Plant in New Mexico.

sure until 2018. However, the plant may close earlier if it fails to perform reliably, the NDA said.

- Construction of an interim spent fuel storage facility in Mutsu City, Japan, is now 53 percent complete, and completion of the centralized dry cask storage facility, Japan's first, is scheduled for August 2013. It will have a capacity of 3000 metric tons of uranium.

- More than half, 53 percent, of the respondents in a public opinion poll in the United Kingdom's Cumbria county supported councils in the county participating in the search for a suitable site for the country's high-level waste repository. A third of the respondents said that the councils should not participate in the search. The primary reasons given for support the area's participation in the site search were employment opportunities from hosting the repository, as well as the fact that most of the country's radioactive waste is already in storage at the Sellafield site.

- On April 26, the 26th anniversary of the Chernobyl accident, construction began on the giant arched structure that will protect the destroyed Chernobyl-4 unit and enable its dismantlement. The building, some 108 meters high, 257 m wide, and 150 m long, will be assembled on concrete rails and slid into place over the damaged Unit 4 building. It will then be hermetically sealed to allow engineers to remotely dismantle the crumbling sarcophagus that has shielded the remains of the reactor since just

weeks after the accident. The instability of the sarcophagus has developed into one of the major risk factors at the Chernobyl site, and its potential collapse threatens the release of more radioactive materials.

● The team reviewing the financing system for Sweden's spent fuel and nuclear waste disposal program has been given an extra year to make its preliminary and final reports. The preliminary report is now due on May 31, 2013, while the final report is due on December 14, 2013. The reports were originally due in October and December 2011, respectively. The review team is headed by the Swedish Safety Authority, and includes the Swedish National Council for Nuclear Waste and the Swedish National Debt Office. In Sweden, nuclear power plant operators pay a fee per kilowatt-hour of electricity produced to a fund that is in-

tended to cover both the costs of waste and spent fuel handling and the costs of plant decommissioning.

● The United Kingdom's newest laboratory for the analysis of radioactive materials is under construction at Dounreay. The 1300-square meter, £9 million (nearly \$14 million) laboratory will play a key role in completing the safe cleanup and demolition of the Dounreay site. Samples of radioactive materials, liquids, and gases will be sent to the new laboratory to be analyzed, providing project managers with vital information about the hazards their staff may encounter at they decommission site facilities. The modular-designed laboratory is being fabricated offsite and being delivered to Dounreay in 35 modules. Construction is due to be completed in August 2013, and, subject to regulatory approvals, the lab should be able to begin testing in 2014. ■