

Washington orders DOE to step up tank waste transfer; other Hanford updates

The Washington State Department of Ecology issued an administrative order to the Department of Energy on March 21, directing the federal government to begin removing radioactive liquid waste from a leaking double-shell tank at the DOE's Hanford Site near Richland, Wash., by September 1, 2014.

The underground tank, AY-102, was confirmed to be leaking by the DOE in October 2012. The tank holds approximately 800,000 gallons of sludge and liquid waste from the past production of defense-related plutonium. Waste was found to be leaking into the annulus, the space between the primary and secondary tank shells, but so far no evidence has been found that waste is escaping the secondary shell into the environment.

The Department of Ecology's order requires the DOE and its contractor Washington River Protection Solutions (WRPS) to begin pumping tank AY-102 about 18 months sooner than what the DOE proposed in its revised pumping plan provided to the state on March 7. That plan, which would involve pumping the tank's supernate liquid to a minimum level above the sludge prior to transferring the sludge to two other double-shell tanks, called for hav-

ing all waste-transferring systems in place and ready to begin pumping the tank by March 2016.

The waste was initially discovered in two places within the annulus of tank AY-102. Subsequent visual inspections found little change in the annulus, with only small accumulations of material at the two locations. On March 5, however, the DOE said that it had been notified that WRPS found what appeared to be additional waste in a third location. Based on preliminary visual inspections, the DOE estimates that the dried material is approximately 7 feet by 21 inches.

In addition to the early pumping requirement, the Department of Ecology's order directs the DOE to do the following:

- Submit a report to the state within 90 days that evaluates the integrity of the secondary containment system, including the impacts of the waste currently in the annulus.
- Take monthly samples of liquid from the tank's leak detection pit to address potential leaks to the environment.
- Conduct weekly video inspections of leaks and monthly video inspections of the annulus.
- Initiate the removal of solid waste (sludge) no later than December 1, 2015.
- Complete removal of enough waste to allow for an inspection to determine the cause of the leak by December 1, 2016.

The Department of Ecology said that failure to comply with the order could result in fines to the DOE.

• On March 31, the Department of Energy submitted to the state of Washington a proposal to amend Hanford's Consent Decree. Along with the Tri-Party Agreement, the 2010 Consent Decree is one of two agreements governing the cleanup of the Hanford Site. According to the DOE, the Consent Decree has a number of milestones associated with the completion of the Waste Treatment and Immobilization Plant (WTP), which is being built to treat and immobilize through vitrification the site's tank waste. The DOE has determined, however, that unresolved technical issues could prevent the WTP from safely operating as designed.

The DOE said it is proposing a



To overcome delays caused by safety issues, the Department of Energy is proposing a phased approach to vitrifying tank waste at the Hanford Site's Waste Treatment and Immobilization Plant. (Photo courtesy of the DOE)

phased approach to treating and immobilizing tank waste by moving forward on the mostly liquid portion of the tank waste, while continuing work to resolve the technical issues. The proposal provides a set of near-term, fixed milestones for certain activities and sets forth a process with time frames for establishing additional milestones once the technical issues are resolved. According to the DOE, the plan will require that some additional facilities will be needed, one for pretreating the low-level radioactive waste and another for mixing, sampling, and feeding the high-level radioactive waste.

On April 18, Washington State rejected the DOE's amendment proposal, saying it "lacks sufficient specificity, accountability, and enforceability." The DOE, likewise, rejected Washington's own proposal to amend the Consent Decree, claiming it "does not adequately account for the realities of technical issue resolution, project management imperatives, and fiscal constraints, and that it exceeds the scope of the Consent Decree." Washington's proposal called for fixed deadlines for the start-up of the WTP, as well as the allocation of additional resources to addressing the tank waste.

● Earlier, on January 24, the Washington State Department of Ecology announced that the Department of Energy has agreed to make improvements to waste management practices at the Hanford Site and to pay a fine for violations of the state's dangerous-waste regulations. The violations were identified during Department of Ecology inspections at Hanford's Central Waste Complex and Waste Receiving and Processing Facility in July 2011 and February 2012, respectively.

According to the Department of

Ecology, the DOE has agreed to comply with state regulations and to address the concerns identified at the two facilities, as well as at Hanford's T Plant. The DOE also has been levied a \$261,000 fine, \$15,000 of which was due immediately. The Department of Ecology said that it will suspend the remainder of the fine if the DOE makes a number of changes to how it manages mixed hazardous and radioactive wastes at the three facilities, including more immediate notification to the state when spills or other incidents occur, better reporting on the cause of violations, and more frequent inspections covering more features of stored wastes and storage buildings.

- The Department of Energy's Richland Operations Office and Office of River Protection on February 18 released the *2014 Hanford Lifecycle Scope, Schedule, and Cost Report*. The annual report describes the activities and costs associated with the cleanup of the Hanford Site; the latest edition reflects information that is current as of December 1, 2013. This is the third lifecycle report issued since 2010, when the report was required under the Tri-Party Agreement among the DOE, the Environmental Protection Agency, and the Washington State Department of Ecology.

According to the DOE, Hanford's remaining estimated cleanup costs through 2090 total approximately \$113.6 billion, including the estimated cost to clean up the site's River Corridor and Central Plateau, along with the tank waste located within the Central Plateau. The cost estimate also includes mission support activities (infrastructure and services) and reasonable allowances for cost and schedule uncertainties, the DOE said. The estimated cost is \$1.2 billion less than the 2013 Lifecycle Report estimate of \$114.8 billion. The DOE attributes the decrease to work completed in fiscal year 2013 and refinements to the planning estimate made by the Richland Operations Office.

The 2014 Lifecycle Report can be found on the Hanford website at www.hanford.gov.

- A Hanford contractor employee who raised safety concerns regarding the design and construction of the Waste Treatment and Immobilization Plant (WTP) was removed from her job by her employer, URS Corporation, the Associated Press reported on February 18. Last year, Donna Busche filed a lawsuit against Department of Energy contractor Bechtel National and its primary subcontractor, URS, claiming that the companies were working to fire her in retaliation for raising safety issues. Busche was the manager of environmental and nuclear safety for the

WTP project.

Busche initially filed a whistle-blower complaint with the Department of Labor in 2011. As no decision in the matter had been issued after a year, the federal Energy Reorganization Act allowed her to file the case in federal court, according to a February 10 report by the *Tri-City Herald*. The case, however, has been put on hold until May, the paper reported.

URS told the AP that it does not agree with Busche's assertions that "she suffered retaliation or was otherwise treated unfairly," adding that Busche was fired for reasons unrelated to the safety concerns.

Busche is the second whistle-blower to be dismissed by URS in recent months. In October of last year, the company fired Walter Tamosaitis, a WTP technical manager who was removed from the project in 2010. Tamosaitis claimed that he was taken off the project and fired because he raised safety issues. URS said Tamosaitis's removal was part of a larger workforce reduction due to budgetary constraints.

Waste confidence schedule revised

The Nuclear Regulatory Commission will not meet its September 6 deadline for issuing the final versions of its waste confidence generic environmental impact statement (EIS) and final rule on the extended storage of spent nuclear fuel at the nation's commercial nuclear power plants, the agency announced on January 23. The NRC's new schedule calls for the rule and EIS to be issued no later than October 3. The NRC said the delay reflects time lost during the federal government shutdown and lapse of appropriations last October. The shutdown forced the NRC to reschedule several public meetings and to extend the public comment period on the new rule by nearly a month.

During a January 29 public teleconference to discuss the status of the waste confidence rule, Andy Imboden, of the NRC's Office of Nuclear Material Safety and Safeguards, said that during the 98-day public comment period, the NRC received over 33,000 written comments, the majority of which were identical form letters, along with 1,600 pages of transcripts from the 13 public hearings held by the NRC.

Imboden said that the NRC's next steps are to review the comments and respond to them and then incorporate any changes into the final rule and EIS. Imboden said that

the NRC staff will submit the updated documents to the commissioners this summer for review and possible revision.

According to Keith McConnell, director of the NRC's Waste Confidence Directorate, the NRC could resume making final decisions on commercial nuclear power licenses by November 3. The NRC suspended licensing activities that depend on the waste confidence rule in August 2012 after an appeals court vacated the 2010 update to the rule. McConnell noted that after the new rule is published in the *Federal Register*, there will be a 30-day waiting period before the rule becomes effective, after which licensing could resume.

- The Nuclear Regulatory Commission has indicated that

it may retire the term "waste confidence," as it prepares the final rule. During a March 21 meeting of the commissioners with external stakeholders and NRC staff, NRC staffer Andy Imboden stated that the vast majority of comments on the proposed rule, in writing and at public meetings, objected to the term "waste confidence," regardless of the commenter's opinion on nuclear power.

Imboden explained that opponents argued that there can be no confidence in the safety of spent fuel storage, and proponents stated that a claim of confidence in at-reactor storage could indefinitely prevent the opening of a high-level waste repository or the use of spent fuel reprocessing. Imboden said that the staff generally agrees that there should be a name change but has not yet cho-

sen a new one to propose to the commissioners.

Discussion among the stakeholders also showed disagreement as to whether the finished product would satisfy the U.S. Court of Appeals for the District of Columbia Circuit and would allow the NRC to lift its suspension of final actions on new reactor licensing and license renewals. Geoffrey H. Fettus, of the Natural Resources Defense Council, argued that the court action did not remand waste confidence but vacated it, and he proposed that the NRC go through a different rulemaking, establishing a system in which a separate EIS would be developed in each of the suspended proceedings and any subsequent license applications.

Yucca Mountain review requests rejected

On January 24, the Nuclear Regulatory Commission issued a memorandum and order in which it denied requests that it clarify and reconsider certain aspects of its plan for resuming its review of the Department of Energy's license application for the Yucca Mountain radioactive waste repository. The state of Nevada and the five petitioners in the writ of mandamus case that ordered the NRC to resume the Yucca Mountain license review had filed separate motions in response to the NRC's November directive to its staff to complete and release the remaining volumes of the Yucca Mountain safety evaluation report (SER).

The state of Nevada, concerned about the time needed to respond to the SER once it is completed, had asked that the NRC clarify its license review milestones. The state also sought clarification of the NRC's directions to its staff to "adopt work previously completed as a first principle," which Nevada interpreted as implying that all previously completed SER work may be adopted without further "investigation or inquiry." The NRC found clarification of either point to be unnecessary, stating that it expects the agency staff "to complete a robust review addressing all applicable regulatory requirements, with its analysis and conclusions documented in the SER, and for those working on the project to exercise their independent professional judgment in the performance of their duties."

The five parties in the writ of mandamus petition—Nye County, Nev.; the state of South Carolina; the state of Washington; Aiken County, S.C.; and the National Association of Regulatory Utility Commissioners—had asked

the NRC to establish a detailed schedule for the release of each individual SER volume, as well as an explanation for the NRC's estimated costs for completing the SER. The NRC declined to provide any more information than was provided in its staff order, noting, "Nothing in the court's decision required us to undertake a particular course of action, to conduct an accounting containing the level of detail sought by the five parties, or to subject the staff's estimates of the time required to perform its work to the scrutiny of third parties."

Court won't rehear waste fee case

The Department of Energy was denied a waste fee rehearing by the U.S. Court of Appeals for the District of Columbia Circuit on March 18. The court had ruled last November that the federal government could no longer collect a fee of one-tenth of a cent per kilowatt-hour of nuclear-generated electricity for the purpose of funding a geologic repository for spent fuel and high-level nuclear waste. The fee was established by the Nuclear Waste Policy Act of 1982, which also designated Yucca Mountain, in Nevada, as the site for the repository.

In January, the DOE petitioned the court for a rehearing, either by the three trial judges or by the entire appellate court. The DOE argued that conflicting rulings by the court—on the one hand, blocking the DOE from using Yucca Mountain as a proxy for the calculation of waste fees and, on the other hand, preventing the DOE from considering sites other than Yucca Mountain as the basis for the calculation—have left the DOE in a "damned if you do, damned if you don't" position. The court ultimately dismissed the DOE's petition.

Following the court's decision, Ellen Ginsberg, vice president and general counsel for the Nuclear Energy Institute, a party in the lawsuit against the DOE, said, "Nuclear energy generators are very pleased that their consumers will not have to pay the fee while no program is under way. However, the industry is extremely eager for the government to meet its legal obligation to dispose of used nuclear fuel. Once the Energy Department's Yucca Mountain repository program is restarted or another waste disposal program is enacted by Congress, the DOE then will be able to evaluate the projected costs of the program to determine whether additional funds will be required. Currently, the Nuclear Waste Fund has approximately \$34 billion remaining and annual interest income is accruing at the rate of about \$1.3 billion."

Spent nuclear fuel

The risks of transporting spent nuclear fuel are very low, according to a report by the Nuclear Regulatory Commission released on February 12. The report, *Spent Fuel Transportation Risk Assessment* (NUREG-2125), presents the results of the NRC's fourth investigation into the safety of transporting spent nuclear fuel, which the agency said reconfirms earlier findings that the radiological impacts from moving spent fuel in compliance with federal regulations are very low. According to the NRC, improvements in the ability to evaluate spent fuel casks and to quantify risks have resulted in a decrease in the calculated per-shipment risk as compared with the earlier studies. The new study found that the collective dose risks from the routine transport of spent fuel are approximate-

ly four to five orders of magnitude less than the collective background radiation dose and that there is a one-in-a-billion chance that radioactive material would be released if an accident occurred during a spent fuel shipment.

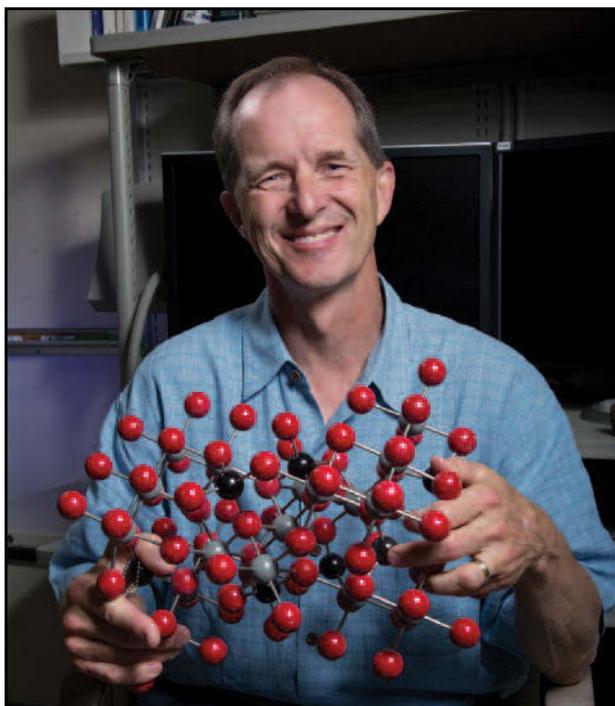
- The Nuclear Regulatory Commission will audit spent nuclear fuel pool instrumentation compliance of power reactor licensees. In a March 26 letter to its licensees, the NRC stated that the audits will assist the agency in completing its reviews of submittals regarding conformance with the March 2012 order on reliable spent fuel pool instrumentation in the aftermath of the March 2011 accident at Fukushima Daiichi in Japan. If necessary, on-site audits will be carried out in conjunction with audits related to a post-Fukushima order on mitigation strategies for beyond-design-basis external events. If a licensee prefers not

to participate in the audit process, the NRC staff will request the information needed to determine compliance with the instrumentation order by a different means. For the audit, licensees have been requested to make the relevant information available through the ePortal system that was developed by the licensees for the spent fuel pool instrumentation review process.

Radwaste-soil interactions modeled

Sandia National Laboratories announced on January 28 that it is developing computer models to show how radioactive waste interacts with soil and sediments. Sandia geoscientist Randall Cygan said that the models will be used to study clay minerals, which are difficult to characterize through traditional experimental methods.

“We can’t slap these materials on a microscope or conventional spectrometer and see if contaminants are incorporated into them,” Cygan said of the ultrafine grains of



Sandia National Laboratories geoscientist Randall Cygan uses computer models to study how contaminants interact with clay minerals. (Photo courtesy of Lloyd Wilson)

clay, less than 2 microns in diameter, that often dominate soils. “On a computer we can build conceptual models. Such molecular models provide a valuable way of testing viable mechanisms for how contaminants interact with the mineral surface.”

Clay minerals are made up of aluminosilicate layers held together by electrostatic forces. Water and ions can seep between the layers, causing them to swell, pull apart, and adsorb contaminants. “That’s an efficient way to sequester radionuclides or heavy metals from groundwater,” Cygan said.

Using molecular modeling to describe the characteristics and interaction of the contaminants in and on the clay minerals, Sandia researchers are developing the simulation tools and the critical energy force field needed to make the tools as accurate and predictive as possible.

“We’re providing the fundamental science to improve performance assessment models to be as accurate as possible in understanding the surface chemistry of natural materials,” Cygan said. “This work helps provide quantification of how strongly or weakly uranium, for example, may adsorb to a clay surface, and whether one type of clay over another may provide a better barrier to radionuclide transport from a waste repository. Our molecular models provide a direct way of making this assessment to better guide the design and engineering of the waste site.”

EPA settlement to fund mining remediation

Approximately \$985 million will be paid to the Environmental Protection Agency to fund the cleanup of approximately 50 abandoned uranium mines in and around the Navajo Nation, the U.S. Department of Justice announced on April 3. The payment is part of a \$5.15 billion settlement between the United States and the Kerr-McGee Corporation, along with certain of its affiliates and their parent company, Anadarko Petroleum Corporation. According to the DOJ, this is the largest environmental enforcement recovery ever made by the department.

In addition to the \$985 million to address uranium contamination resulting from Kerr-McGee mining operations, the Navajo Nation will receive more than \$43 million to address radioactive waste left at the former Kerr-McGee uranium mill in Shiprock, N.M., the DOJ

said. Funds from the settlement also will be used for the cleanup of dozens of contaminated sites across the country, including the Welsbach EPA Superfund site in Gloucester, N.J., which is contaminated with thorium, as well as a former chemical manufacturing site in Nevada that has led to contamination in Lake Mead.

Canada narrows site host candidates

Canada's Nuclear Waste Management Organization has further narrowed the field of potential host communities for a deep geologic repository for the country's used nuclear fuel. On January 16, the NWMO informed the mayors of Arran-Elderslie and Saugeen Shores, Ontario, that their communities would not continue in the site selection process for a repository. Arran-Elderslie and Saugeen Shores are located near the Bruce nuclear power plant outside of Kincardine, Ontario.

Using an "adaptive phased management" approach to selecting a nuclear repository site, the NWMO began its search for a willing host community in 2010. The organization identified 21 communities that had expressed an interest in learning more about hosting a repository. In November of last year, the NWMO approved four of those communities—Creighton, in Saskatchewan, and Hornepayne, Ignace, and Schreiber, in Ontario—for further study as a host site, and eliminated four other locations. With the removal of Arran-Elderslie and Saugeen Shores from the selection process, 11 communities have yet to be assessed.

According to the NWMO, early findings have indicated that both Arran-Elderslie and Saugeen Shores "have very limited potential to meet the geoscientific criteria required to host a deep geological repository." The NWMO concluded that the area in and around Arran-Elderslie does not have enough of the preferred host rock, Ordovician Cobourg Formation limestone, in depths greater than the preferred minimum of 500 meters. Likewise, the agency said that Saugeen Shores contains a number of constraints that greatly reduce the prospect for finding areas large enough for hosting the repository's surface and underground facilities.

Among the 11 municipalities still under review are Brockton, South Bruce, and Huron-Kinloss, all of which are located within 45 miles of Arran-Elderslie and Saugeen Shores.

South Africa opens waste management institute

A national radioactive waste management institute has been launched in South Africa. S.A. Minister of Energy Dikobe Ben Martins officially launched the National Radioactive Waste Disposal Institute (NRWDI) on March 31, according to the S.A. Department of Energy (SA-DOE).

The institute is charged with the responsibility of managing radioactive waste disposal on a national basis, and its launch is a culmination of more than a decade of careful planning and consultation activities by government with the public, stakeholders, and interested parties, the SA-DOE said. It will be responsible for the management and disposal of radioactive wastes and materials that emanate from the use of ionizing radiation at medical facilities, from industrial activities, and from any other entity that has to dispose of radioactive waste.

In terms of legislation, the NRWDI is charged with the planning, design, construction, operation, management, and monitoring of any new radioactive waste disposal facility. This is an important step forward for the country, the SADOE said, since the NRWDI may now formally engage in making concrete plans for the management, interim storage, and disposal of all the high-level wastes that are currently being temporarily stored at the nuclear facilities at Koeberg and Pelindaba. At present, all low-level and intermediate-level wastes are disposed of at the Vaalputs National Radioactive Waste Disposal Facility in the Northern Cape, which will be now operated by the institute.

The NRWDI's establishment follows its promulgation by Parliament in January 2009 under South Africa's National Radioactive Waste Disposal Act of 2008.

D&D Updates

- The Department of Energy announced on January 13 that work to remove Cold War-era weapons production waste has begun at the eighth area of the Idaho Site's 97-acre Subsurface Disposal Area (SDA). To date, the retrieval of waste from six of the nine targeted waste areas within the SDA has been successfully completed, the DOE said.

Under an agreement with the state of Idaho, the DOE and its contractors have been digging up targeted

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transuranic and hazardous wastes from the site's Radioactive Waste Management Complex and shipping the waste for permanent disposal at the department's Waste Isolation Pilot Plant near Carlsbad, N.M. The waste was generated during nuclear weapons production at the Rocky Flats Plant near Denver, Colo., and was shipped to Idaho for burial from 1954 to 1970.

The DOE said that crews have been working to remove the waste since 2005, but in late 2012, waste exhumation was suspended due to funding restrictions imposed by the federal government's continuing resolution and sequestration. According to the DOE, cleanup contractor CH2M-WG Idaho and the DOE Idaho Operations Office were able to identify efficiencies in other cleanup projects at the Idaho Site that allowed for the resumption of waste exhumation in late September 2013. CH2M-WG Idaho has hired 62 employees to support the work, the DOE said. To date, waste has been retrieved from 3.16 acres of the 5.69 acres required under a 2008 Record of Decision developed by the DOE, the state of Idaho, and the Environmental Protection Agency. According to the DOE, the buried waste retrieval project will cost approximately \$1.3 billion and is expected to continue into the next decade.

- The Department of Energy has issued an amended notice of intent to prepare an environmental impact statement (EIS) for the cleanup of certain areas of the Santa Susana Field Laboratory site in Ventura County, Calif. The amended notice of intent, published in the February 7 *Federal Register*, describes the DOE's proposed actions for the remediation of the site's Area IV and Northern Buffer Zone, as well as cleanup concepts proposed by the local community.

Santa Susana's Area IV contains the DOE's former Energy Technology Engineering Center, where, starting in the early 1960s, liquid metals research and testing were conducted and where the DOE operated 10 small research reactors. Reactor operations ended in 1980, and nuclear research was completed in 1988. The operation of the research facilities and reactors resulted in radiological contamination of soil and groundwater, and the concrete containment that surrounded the reactors became radioactive.

The DOE is proposing to demolish the remaining DOE-owned buildings and to dispose of the debris off-site. The DOE also said that where possi-

ble, it will use on-site treatment of contaminated soils and natural attenuation to reduce the volume of soil waste. Any treated soil that cannot remain on-site will be shipped off-site for disposal. The DOE expects to issue a draft EIS late this year, followed by a 45-day public comment period.

- The San Onofre Community Engagement Panel (CEP) has been established to foster public education and involvement during the decommissioning of the San Onofre nuclear power plant in Southern California. According to Southern California Edison, the CEP will serve as a conduit of information between the plant's owners and the public. SCE announced on February 6 that David Victor, a professor at the University of California at San Diego and a member of the Electric Power Research Institute's board of directors, has been named chairman of the CEP and that Edward "Ted" Quinn, an American Nuclear Society past president (1998–1999), is a member of the panel.

In June 2013, SCE announced that it would close San Onofre-2 and -3 and begin preparations to decommission the plant. The CEP will hold public meetings at least quarterly to provide information on key decommissioning issues, including the timing of the transfer of spent nuclear fuel from pools to dry cask storage and SCE's blueprint for decommissioning as detailed in the postshutdown decommissioning activities report to be submitted to the Nuclear Regulatory Commission. More information about the CEP is available at www.songscommunity.com.



A community panel will foster public engagement in the decommissioning of the San Onofre nuclear power plant in Southern California. (Photo courtesy of Wikimedia Commons)

● The Waste Solidification Building (WSB) will be mothballed for five years or more, as the startup date for the Mixed Oxide (MOX) Fuel Fabrication Facility at the Department of Energy's Savannah River Site in South Carolina remains unclear. According to a December 27 report from the Defense Nuclear Facilities Safety Board, the National Nuclear Security Administration directed DOE contractor Savannah River Nuclear Solutions (SRNS) to place the WSB in lay-up for a period of not less than five years following acceptance and startup testing of components and systems. Originally scheduled to start up in 2013, the WSB is designed to treat transuranic and low-level radioactive waste resulting from the production of mixed-oxide fuel. The DNFSB said that the balance of plant construction is to be completed, but no additional equipment will be purchased or installed unless it is required for acceptance or startup testing. "[SRNS] is to develop the safety basis documents, submit them to NNSA, and maintain their configuration, but NNSA will not formally approve them during this lay-up period," the report says.

In its fiscal year 2015 budget proposal, the Obama administration is seeking to cut funding for the MOX facility and place it in "cold-standby."

● The Department of Energy's Office of Environmental Management (EM) announced on April 10 that it is funding research at the Savannah River National Laboratory to develop a material to safely contain the radioactive waste generated by a planned multiyear decontamination project at the Savannah River Site while the waste is being shipped for disposal. EM's Office of Site Restoration is funding the research as part of its technology development and deployment efforts.

According to EM, the lab is working to create an organic thin film that would be applied as a polymer coating to the surface of plastic containment bags within metal containers used to transport plutonium-238. The containment bag solution would resolve a complex technical challenge in the deactivation and decommissioning of inactive plutonium processing facilities requiring waste containers resistant to radiation degradation, EM said.

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The Savannah River Site plans to decontaminate the F Area Building 235-F Plutonium Fuel Form Facility. Constructed in the 1950s as part of the site's weapons materials production and fabrication missions, the facility was used primarily for plutonium and neptunium component production processing before its operations were discontinued in 1983.

- Following a February 3 hearing, the Canadian Nuclear Safety Commission issued Ontario Power Generation (OPG) a "license to abandon" for the Bruce Heavy Water Plant, which the company began decommissioning 10 years ago. The CNSC, having reviewed OPG's application for a license to abandon, found that it meets the requirements of Canada's regulations under the Nuclear Safety and Control Act. According to OPG, all above-ground buildings, structures, and towers on the site have been removed, and the 178-acre property has been released for industrial (brown field) use.

Located at the Bruce nuclear site on the shore of Lake

Huron, near Kincardine, Ontario, the Bruce Heavy Water Plant was in continuous operation from April 1973 until March 1998, producing over 16,000 megagrams of heavy water for use in Canada's heavy-water-moderated CANDU reactors. OPG said that the decision to shut down the plant was made after it was determined that the inventory of heavy water was more than sufficient to supply current and future needs. OPG began decommissioning the plant after receiving a decommissioning license from the CNSC in 2004. Demolition and soil remediation activities took place between 2005 and 2009, followed by three years of postdemolition monitoring, according to OPG.

Approximately 97 percent of the 49,579 metric tons of demolition waste was recycled, and the rest was disposed of in conventional and industrial landfills, OPG said. Soil remediation activities were designed to minimize the final volume of soil to be disposed, including the use of a bioremediation cell on the Bruce site to clean up petroleum hydrocarbons. ■