

Commissioners Push for June 1 ASLB Decision on DOE Motion to Withdraw Yucca Mountain License Application; Lawsuits Filed to Stop DOE Closure of Project

On March 3, the U.S. Department of Energy filed a motion with the U.S. Nuclear Regulatory Commission to withdraw the license application, "with prejudice," for a high-level nuclear waste repository at Yucca Mountain. "With prejudice" means that the DOE would be unable to resubmit the license application at a later time. The DOE had announced in early February, during the fiscal 2011 budget briefing, that it was going to be taking this action.

But even before the DOE formally asked the NRC to dismiss the license application, lawsuits were being filed against the action, on the grounds that the decision to shut down the Yucca Mountain repository program violated multiple provisions of the Nuclear Waste Policy Act, directly contradicting Congress' decision to move forward with the project. The first lawsuit, from three individuals living and working near the DOE's Hanford Site (which expects to send a good deal of defense-related waste material to a final repository), was filed in mid-February. Since that time, lawsuits have been filed by the states of Washington and South Carolina; by the National Association of Utility Regulators (NARUC), which represents state regulators and public utility commissions, over the DOE's decision to continue to collect fees for the Nuclear Waste Fund despite the fact that there is no longer any repository project; and by the Nuclear Energy Institute and 16 nuclear utilities, also seeking a suspension of payments into the Nuclear Waste Fund. The Nuclear Waste Fund is funded by nuclear utility customers, who pay a fee of 1 mill per kilowatt-hour of nuclear electricity generated. The money is intended to cover the costs of developing and operating a spent fuel repository.

In early April, the NRC's Atomic Safety and Licensing Board (ASLB) for the Yucca Mountain project, the entity that will ultimately have to make the up or down decision on the license application withdrawal, announced that it would not act on the DOE's motion until the appeals court rules on all the various lawsuits. On April 12, the DOE filed a petition with the commissioners for interlocutory review to overturn the ASLB's decision to wait for the appeals court action. And on April 23, the commissioners voted unanimously to overturn the

ASLB's holding action, requesting a decision on the DOE's motion to withdraw the application by no later than June 1, 2010. According to an NRC spokesman, regardless of what decision the ASLB makes, it will most likely be appealed to the commissioners, and their decision will most likely be appealed to the D.C. Court of Appeals.

The Obama administration and Energy Secretary Steven Chu have stated that Yucca Mountain is unsafe and unsuitable as a location for a waste repository. The administration has instead appointed a Blue Ribbon Commission (see story, below) to study the nuclear waste issue and make recommendations for its management within two years. Critics, however, contend that the administration's actions to shut down the Yucca Mountain project have little to do with either safety or suitability, and instead are political payback to Nevada Sen. Harry Reid, the current Senate Majority Leader, who strongly opposes the project.

- In related news, a former Yucca Mountain project employee has petitioned the NRC to shut down all U.S. operating reactors because there is no longer a viable path to dispose of the spent fuel from these units. The petition was filed in February and was announced in an April 1 *Federal Register* notice. The petition asked that the NRC cease licensing new nuclear power plants and begin an orderly phase-out of the 104 operating commercial reactors in the country.

Blue Ribbon Waste Panel Holds First Meeting in March

The Blue Ribbon Commission on America's Nuclear Future held its first meeting on March 25 and 26. The 15-member panel has been tasked with developing a new strategy for the management of commercial spent nuclear fuel and high-level waste from the nation's nuclear weapons program.

Earlier in the month, the U.S. Department of Energy released the charter for the commission. Specifically, the commission has been charged to provide advice, evaluate alternatives, and make recommendations on a range of issues, including the following:

- Existing fuel cycle technologies and research and development programs.
- Options for safe storage of spent nuclear fuel while final disposition pathways are selected and deployed.

- Options for permanent disposal of spent fuel and/or high-level nuclear waste, including deep geological disposal.
- Options to make legal and commercial arrangements for the management of spent nuclear fuel and nuclear waste in a manner that takes the current and potential full fuel cycles into account.
- Options for decision-making processes for management and disposal that are flexible, adaptive, and responsive.
- Options to ensure that decisions on management of spent nuclear fuel and nuclear waste are open and transparent, with broad participation.
- The possible need for additional legislation or amendments to existing laws, including the Nuclear Waste Policy Act of 1982, as amended.

One issue not discussed by the commission either at the first meeting or in future meetings is the exact location of any eventual waste facilities. The commission will not deal with siting issues, according to Energy Secretary Steven Chu. Nor should they spend time looking at the past (specifically, at the Yucca Mountain project). Rather, Secretary Chu stated, they must keep their sights set on the future.

The first report from the commission is due 18 months from its formation earlier this year; the final report is due in 24 months. Many in Congress, however, are pushing for an interim report at the end of this year.

Groundwater Contamination at Vermont Yankee Threatens License Renewal

A leak from pipes in a concrete tunnel at the Entergy Corp.'s Vermont Yankee nuclear power plant has resulted in tritium contamination in groundwater on the plant site. The contamination, first discovered in January in samples taken from an onsite groundwater monitoring well, was traced to two pipes inside the Advanced Off-Gas pipe tunnel. One pipe contained liquid and the other, steam. The drain that would normally drain any leaks from these pipes was clogged, causing radioactive water to accumulate and escape into the groundwater through a gap in one of the concrete walls surrounding the pipes. Groundwater cleanup at the plant began in late March. No tritium has been detected in drinking water supplies or in the nearby Connecticut River.

Elevated levels of cobalt-60, manganese-54, zinc-53, and

cesium-137 also turned up in soil samples around the plant, consistent with a leak of nuclear reactor water. None of these or any other nuclear reactor-related material other than tritium has been found in the groundwater.

Compounding the problem was an accusation that Entergy employees intentionally misled the Vermont Public Service Board, the Department of Public Service, a Public Oversight Panel assessing the plant's reliability, and Nuclear Safety Associates, a contracting firm working for the panel, when they initially denied that there was underground piping at the plant. A report on the alleged misconduct found that Entergy employees considered that "underground piping" referred only to pipes that touch soil and that carry liquid. As noted previously, the leaking pipes were encased in concrete, and one of those pipes carried steam. Nonetheless, several senior Vermont Yankee employees were removed from their positions and placed on administrative leave, and an additional six managerial employees were disciplined.

The timing of the leaks could not have been worse for Entergy, which is pursuing license renewal for the plant. Disturbed by the leaks and contamination, the Vermont Senate voted 26-4 in late February to approve S.289, which would require legislative approval for continued operation of the plant when its current license expires in 2012.

The Senate vote is not a final ruling on the future of the plant, however. Approval of both houses would be needed to prevent license renewal, and it was not certain that the Vermont House would even consider the bill in this session (which ran through April). In addition, Entergy was said to be hoping for a reversal of the Senate vote next year, citing a new report on the plant's economic impact in the state.

In addition, the U.S. Nuclear Regulatory Commission is determining what, if any, regulatory actions might be necessary regarding Vermont Yankee and Entergy's dealings with Vermont officials over the tritium issue.

- In a related story, in early March, Exelon Generation agreed to pay more than \$1 million to resolve three civil complaints filed by the Illinois attorney general and the state's attorneys over leaks of tritium into groundwater beneath the Braidwood, Byron, and Dresden nuclear power plants. The total includes \$628 000 in civil penalties and \$548 000 to fund several supplemental environmental projects in and around the communities where the plants are located. Both the U.S. Nuclear Regulatory Commission and the Nuclear Energy Institute have stated that none of the incidents violated NRC regulations or posed any threat to public health and safety.

Poll: Vast Majority of Americans Concerned about Nuclear Waste Management

A poll by Angus Reid Public Opinion has revealed that while almost half of Americans are in favor of new nuclear power plants being built in the United States, a large majority are concerned about radioactive waste management and nuclear material falling into the wrong hands.

The poll was conducted between February 19 and 21, 2010, with 1010 randomly selected adult Americans questioned in an online survey. The results showed that 48 percent of respondents were in favor of constructing new nuclear power plants in the United States, while 34 percent opposed building new nuclear plants.

However, 81 percent of Americans said they were concerned about nuclear waste management, with 51 percent being “very concerned,” while 74 percent of respondents said they were worried that nuclear technology could fall into the hands of terrorists.

D&D Updates

- In early March, crews at the Hanford Waste Treatment Plant began installing key equipment essential for safely transporting analyzed waste within its Analytical Laboratory. The equipment is part of a waste transfer system that, when the Plant is operational, will move waste that has already been tested through the lab. The external structure of the lab was topped off in 2007, and workers are now focused on the interior of the facility. The Analytical Laboratory is one of the five major nuclear facilities that compose the Vit Plant. It stands 320 feet long, 180 feet wide, and is four stories tall. The Waste Treatment Plant is expected to be operational in 2019.

- R reactor at the U.S. Department of Energy’s Savannah River Site has been fitted with a wireless Intranet service. Crew members working on final closure of the reactor were unable to access SRSnet, a system used for collecting radiological data, time-keeping, safety documentation, and other essential needs. That meant that more than 75 remote workers were required to report approximately two miles away, twice daily, for radiological control accountability using software that could be accessed only via the SRSnet. The success of the \$250 000 project to install a wireless system at R reactor has led the site operator, Savannah River Nuclear Solutions, to allow workers at the F and H Tank Farms to collect radiological data via SRSnet, rather than traditional data gathering performed with hand-held instruments. This improvement will also

reduce health risks associated with data collection in radiological areas.

- The end of an 18-month characterization project using laser and gamma scanning technology within the early primary separation plant at the United Kingdom’s Sellafield facility was announced in March, paving the way for future decommissioning work to begin. A three-dimensional scanning modeling system was used to identify high-radiation hot spot areas within the separation plant’s shear cell—the facility used to shear the fuel prior to dissolving. The software and scanner system takes data from the facility and constructs a map of where the radioactive sources are potentially located. This map can then be used to investigate the worker dose consequences of potential decommissioning plans.

- As explained in a Record of Decision for Decommissioning and Long-Term Stewardship at the West Valley Demonstration Project, the U.S. Department of Energy has identified Phased Decision-making as the preferred alternative for decommissioning the former reprocessing facility, located in northern New York. Under the alternative, in Phase 1, the DOE would decommission the Main Plant Process Building, Vitrification Facility, Remote Handled Waste Facility, and lagoon areas. No decommissioning actions would be taken on the underground high-level waste tanks and the U.S. Nuclear Regulatory Commission-licensed Disposal Area. The New York State Energy Research and Development Authority (NYSERDA) would manage the state-licensed Disposal Area in place. While the decommissioning activities are under way in Phase 1, which is expected to take 8 to 10 years, the DOE and NYSERDA will undertake studies to help determine the best technical approach to complete decommissioning of the remaining facilities and to facilitate consensus decision-making in that regard. The NRC has concluded its review of the Phase 1 decommissioning plan and has stated that the plan will satisfy the decommissioning criteria for unrestricted use spelled out in NRC regulations.

- According to the U.K. Nuclear Decommissioning Authority, decommissioning work at two of the United Kingdom’s oldest nuclear power plants has reached major milestones with the final removal of uranium from Chapelcross and the removal of asbestos cladding at Calder Hill. More than 10 000 drums of Magnox depleted uranium stored at the Chapelcross site were transferred into modern stainless steel overpacks before transportation to the U.K.’s primary uranics management facility at Capenhurst. (The material still has the potential for reuse in the nuclear fuel cycle.) The last drum was removed ahead of schedule in the five-year, £6.5 million (\$10 million) project. The five-

year, £26 million (\$40 million) project to strip 2300 tonnes of asbestos cladding from the heat exchangers, turbine halls, and associated facilities at Calder Hall was completed on March 23. In conjunction with a similar project at Chapelcross, the project is thought to be the largest asbestos strip undertaken in Europe.

- Consumers Energy must refund \$86 million in Big Rock Point decommissioning funds within 18 months, the Michigan Public Service Commission announced in February. The PSC said the utility failed to deposit decommissioning funds into the decommissioning trust fund and instead used them for general corporate purposes. A utility spokesperson said the utility believes it has the right to appeal the order. Decommissioning work at Big Rock Point was completed in 2007.

- Despite the fact that the Dounreay nuclear power station in northern Scotland was not necessarily universally loved by the local residents during its years of operation, the iconic “golf ball” structure that housed the station’s experimental fast breeder reactor has gained an important place in Scotland’s heritage. Hence, the many efforts to save the building now that the Dounreay site is being decommissioned, as reported by a Scottish newspaper. Suggestions for retaining the golf ball have included turning it into a hotel, a museum, and an art sculpture. Site operator Dounreay Site Restoration Limited (DSRL) will make recommendations on the dome’s future to the site owner, the U.K. Nuclear Decommissioning Authority, by this summer. A decision is expected by the end of the year. DSRL is leaning toward removal, because of the high cost of stewardship of a radioactive building over centuries of time. Even if the structure were preserved, there would be no public access to it, because it would be sitting in a restricted area. A plastic replica may be one way for the area to retain its major landmark, but that too has a high price tag. Dounreay’s £2.6 billion (\$4 billion) cleanup is expected to be completed by 2025.

- The U.S. Department of Energy has announced its intention to fund additional independent environmental monitoring of the Savannah River Site (SRS) by the state of Georgia. Through its grant program, the DOE’s Savannah River Operations Office will provide the Georgia Department of Natural Resources financial assistance to conduct independent environmental monitoring in Georgia communities bordering SRS to validate that site operations are having no negative effects on human health or the environment. The independent environmental monitoring by the host and neighboring states is in addition to an extensive monitoring program currently conducted by SRS, which samples surface water, sediments, crops, milk, fish, soil, vegetation, thermoluminescent dosimeters, and

groundwater in both Georgia and South Carolina, where the site is located.

- Legislation proposed in the state of Tennessee legislature would prohibit radioactive waste from being disposed of in Tennessee landfills, and would also allow the Tennessee Department of Environment and Conservation to monitor the landfills with their personnel. According to the bill’s sponsor, most states do not allow disposal of radioactive waste in ordinary landfills, and because Tennessee does, the state receives nuclear waste from all over the country. Five landfills in Tennessee are currently licensed to accept nuclear waste, although one of those is no longer accepting such waste.

International Briefs

- The German government has lifted a 10-year moratorium on exploratory work at the Gorleben salt dome, a potential repository for Germany’s radioactive waste. Exploration work at the salt formation began in 1977, and underground exploration began in 1986 with the sinking of two exploration shafts. Work continued until June 2000, when a 3-year to 10-year moratorium was imposed on exploration work (in conjunction with the decision for an eventual phase-out of nuclear power in the country). Currently, German radioactive waste is placed in interim storage, with spent fuel mostly stored at reactor sites. Vitrified waste from foreign reprocessing of German spent fuel is stored in surface facilities at Gorleben and Ahaus. In 2007, work began on a low- and intermediate-level waste repository at the former iron ore mine at Konrad. It is scheduled for operations at the end of 2013.

- Jordan has opened a national interim storage facility for the country’s radioactive waste and nuclear materials. The facility, constructed at the Jordanian Atomic Energy Commission headquarters on the edge of Amman, will provide 500 cubic meters of storage for low- and intermediate-level radioactive waste from hospitals, universities, industry, and scientific research centers for up to 50 years. The facility was partly funded by the U.S. Department of Energy through its Global Nuclear Threat Fund. Previously, many Jordanian institutions kept their radioactive waste—primarily used radioactive sources—in “poor, unsafe, and insecure storage.”

- The first shipment of solid high-level waste belonging to Japanese reprocessing customers arrived in Japan from the Sellafield site after a six-week ocean journey. A single 14-tonne flask containing 28 stainless steel containers of solid HLW left the U.K. port of Barrow in January aboard the transport vessel *Pacific Sandpiper* and arrived in Japan

on March 9. Since 1976, contracts for foreign spent fuel reprocessed in the United Kingdom have contained options providing for the return of radioactive waste from the reprocessing operations to the country of origin.

- The United Kingdom Nuclear Decommissioning Authority is considering its options for the disposition of some 6600 tonnes of Advanced Gas-Cooled Reactor (AGR) spent fuel. Because there is no currently proven way of dry-storing AGR fuel for the long term, the fuel must be stored in spent fuel ponds, and a 100-year pond at Sellafield is being established. Reprocessing may not be the answer, either, because AGRs will continue to generate spent fuel through 2023, and reprocessing all of this fuel may stretch beyond the predicted lifespan of the U.K.'s Thorp reprocessing facility. One option being considered is using Thorp for as long as it is available and then directly disposing of the remainder of the spent fuel. Another option is refurbishing Thorp to enable it to operate for a longer period. Other options include building new reprocessing facilities or using foreign reprocessors.

- In February, the José Cabrera nuclear power plant site was formally handed over to decommissioning firm Enresa to begin the decommissioning of the 142-MWe nuclear plant. Spent fuel has already been removed from the plant and is being stored at an onsite dry storage facility. An estimated 104 000 tonnes of material, mostly concrete, must be dealt with, while 4700 tonnes of steel is expected to be recycled. The cleanup, expected to take some six years, was estimated to cost €135 million (around \$180 million) in 2006.

- In a February 11 report, the Swedish Council for Nuclear Waste has advised the Swedish Nuclear Fuel and Waste Management Co. (SKB) to do more research on the corrosion of copper in spent fuel canisters and how that corrosion might affect long-term safety in a final spent fuel repository. The council is an advisory body to the government. SKB plans to put spent fuel into copper-clad canisters and bury them in granite at a depth of 500 m.

- Germany's Federal Office for Radiation Protection has ordered that some 126 000 barrels of low-level waste must be removed from storage at the country's Asse waste disposal facility. Asse is located within a network of tunnels and caverns left by salt mining research operations, and these have become increasingly unstable over the years, allowing the ingress of groundwater. Germany's fear is that the barrels will corrode and allow groundwater contamination. The barrels will be moved to the surface for alternative storage.

- Slovenia's low- and intermediate-level radioactive wastes will be disposed at a site in Vrbina, ending a site selection process that began in 2004. Construction of the facility

should begin in mid-2012. Two silos at the facility will have a capacity for 9400 cubic meters of waste, enough for half of the Krsko nuclear power plant's operational and decommissioning wastes. The country of Croatia is responsible for the disposal of the remainder of Krsko's wastes, because the plant is jointly owned by the two countries.

- Belgian scientists are working toward an advanced new reactor system with a role in researching radioactive waste transmutation. The Multipurpose Hybrid Research Reactor for High-Tech Applications would be built by SCK-CEN at the Mol site in northern Belgium. The reactor would be unique as a sub-critical assembly relying on an accelerator to achieve periods of criticality. Later, the accelerator could be removed for separate use in fundamental physics research and neutron science, including in the research into waste transmutation, whereby long-half-life radioactive isotopes are implanted with additional neutrons to change into different isotopes that can decay quickly into a stable form.

- A new Russian law requires producers of radioactive materials to contribute to a radwaste disposal fund. The Radioactive Waste Management Act also requires all currently stored waste to be registered, and provides general requirements for placement, construction, operation, and closure of radioactive waste disposal sites.

- The last significant amount of highly enriched uranium (HEU) research reactor fuel in Turkey has been returned to the United States. The return of Turkey's 5.4 kilograms of HEU is part of the National Nuclear Security Administration (NNSA) Global Threat Reduction Initiative (GTRI). The HEU is being replaced with French-made low-enriched fuel that was shipped to Turkey at the end of last year. According to the NNSA, all significant amounts of HEU have been removed from 17 countries now, eliminating potentially weapons-usable material from civilian sites and resulting in a permanent threat reduction. The spent fuel was received by the U.S. Department of Energy's Savannah River Site (SRS).

At the same time, some 102 spent fuel assemblies from Israel were received as part of the GTRI. These most likely came from the Israeli Research Reactor-1 and were also received at SRS.

- The owners of Lithuania's closed Ignalina nuclear power plant have been issued a license for the construction of a very low-level radioactive waste (VLLW) facility, with a capacity of some 60 000 cubic meters, at the site. Most of the waste will be retrieved from existing stores, but additional wastes will be generated during the plant's upcoming decommissioning. The facility will be located close to the new spent fuel storage facility and the solid radioactive waste treatment and storage facility. ■