

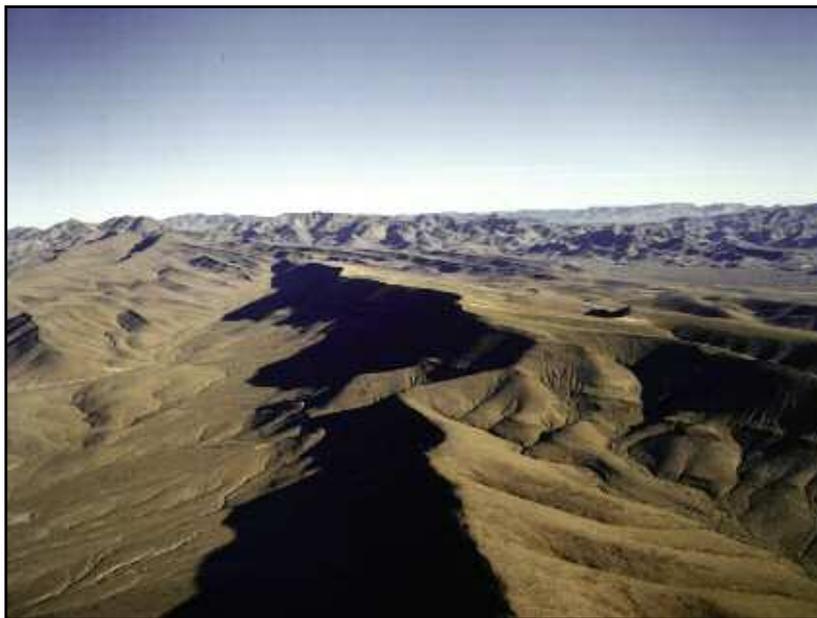
DOE Submits Yucca Mountain License Application to NRC

On June 3, the U.S. Department of Energy submitted to the U.S. Nuclear Regulatory Commission the long-awaited license application to construct a spent fuel/high-level nuclear waste repository at the Yucca Mountain site in Nevada. The 8600-plus-page application describes the DOE's plan to isolate the spent fuel and HLW in tunnels deep underground in a remote ridge on federally controlled land in the Mojave Desert some 90 miles northwest of Las Vegas. Currently, the waste is stored at 121 temporary locations in 39 states across the United States.

"Submittal of the Yucca Mountain license application will further encourage the expansion of nuclear power in the United States, which is absolutely critical to our energy security, environmental goals, and national security," noted Energy Secretary Samuel Bodman. "This license application is the culmination of more than two decades of expert scientific research and engineering, and represents a major milestone for the Department. We are confident that the NRC's rigorous review process will confirm that the Yucca Mountain repository will provide for the safe disposal of spent nuclear fuel and high-level radioactive waste and will be protective of human health and the environment now and into the future.

The license application was accompanied by a Final Environmental Impact Statement, as well as approximately 200 key supporting documents, Bodman said at a Washington, D.C., press conference announcing the license application submittal. The DOE has also made publicly available on the NRC's Licensing Support Network more than 3.6 million documents (totaling some 30 million pages) relating to the Yucca Mountain licensing proceeding.

For the next few months, the NRC will be checking over and "docketing" the application; if the application is accepted, by law the NRC will have three to four years to approve the application and issue a construction license. Once the construction license is issued, the DOE will be able to begin construction on the repository. During the press conference, Ward Sproat, director of the DOE's Office of Civilian Radioactive Waste Management, which oversees the Yucca Mountain program, stated that if the



Aerial view of the crest of Yucca Mountain.

NRC completes its review in the allotted time, and the DOE can begin repository construction in the 2012 timeframe, then the repository could begin accepting waste as early as 2020. He cautioned, however, that this date is dependent on the funding levels that Congress continues to vote for the project.

Yucca Mountain was approved by Congress and President Bush as the site for the nation's first permanent spent nuclear fuel and high-level radioactive waste geologic repository in 2002. More information on the Yucca Mountain project can be found at www.ocrwm.doe.gov.

● In other Yucca Mountain-related news, in May, the U.S. Court of Federal Claims awarded Progress Energy \$82.8 million for costs the company incurred from the U.S. Department of Energy's failure to begin disposing of spent fuel by a 1998 contract date. Progress Energy operates the Brunswick-1 and -2, Harris-1, and Robinson-2 nuclear power plants. The company originally sought \$91 million from the DOE for costs it paid between January 31, 1998, and December 31, 2005, to install spent fuel storage facilities at the plants and to transfer fuel between the plants for storage. Progress Energy's is the latest in a series of some 60 lawsuits filed by U.S. utilities to try to recoup extra costs incurred from the DOE's failure to take the spent fuel by the January 31, 1998, date mandated in the Nuclear Waste Policy Act of 1982.

GNEP Updates

● In late April, the U.S. Department of Energy and the Tennessee Valley Authority signed a Memorandum of Understanding on collaboration to develop and exchange information on advanced fuel cycle technologies, including spent nuclear fuel recycling. This joint effort furthers the DOE's ongoing nuclear research and development activities and, along with other analyses and studies from the nuclear industry, universities, and the DOE's national laboratories, will help to determine the best path forward for the Global Nuclear Energy Partnership (GNEP).

The MOU establishes the overall framework under which the TVA will provide the DOE with supporting data and information to help inform the DOE on advanced fuel cycle technology development concepts, utility perspectives, suitable business models, and additional R&D needed for the advancement of nuclear technology. The TVA currently operates six nuclear reactors as part of its power system, and has submitted a Combined License application to the U.S. Nuclear Regulatory Commission for two advanced reactor design nuclear units at its Bellefonte site; the agency has also resumed efforts to complete a second nuclear unit at the Watts Bar site.

According to the text of the MOU, the TVA "has envisioned a concept for an Advanced Fuel Cycle Demonstration (AFCD) project that could include an instrumented, nuclear fuel recycling center capable of spent nuclear fuel receipt, storage, and reprocessing; fuel fabrication; and, a co-located, flexible reactor facility. Such a demonstration project may offer substantial and distinctive benefits by: 1) providing a platform to focus and integrate DOE's ongoing research and development activities; 2) helping to restore the nation's deteriorating nuclear infrastructure; and 3) addressing critical human capital issues by providing training and experience to the next generation of U.S. engineers, scientists, and technicians."

The MOU notes, however, that "nothing in this MOU should be construed as a selection or endorsement of TVA or its AFCD concept, nor should it be construed as a commitment by DOE to the use of any particular type or origin of spent or nuclear fuel in the evaluation or potential deployment of any AFCD technologies and facilities."

● A recent U.S. Government Accountability Office (GAO) report on GNEP addresses the concept that "DOE Should Reassess Its Approach to Designing and Building Spent Nuclear Fuel Recycling Facilities." The

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report, GAO-08-483, and dated April 22, 2008, questions both the DOE's original approach and its more recent "accelerated approach" to building advanced recycling technologies.

Originally, the GAO report notes, the DOE planned a small engineering-scale demonstration of advanced recycling technologies being developed by DOE national laboratories. The report finds two shortcomings to this approach: 1) it lacks industry participation, potentially reducing the prospects for eventual commercialization of the technologies; and 2) the DOE's schedule calls for building one of the recycling facilities (a reprocessing plant for separating reusable materials from spent fuel and fabricating recycled fuel) before conducting R&D on recycled fuel that would help determine the plant's design requirements. This schedule unnecessarily increases the risk that the spent fuel would be separated in a form that cannot be recycled.

More recently, however, the DOE has favored an accelerated approach, working with industry to demonstrate the latest commercially available technology in full-scale facilities and to do so in a way that will attract industry investment. This approach would "likely require using improved evolutions of existing technologies that would

reduce radioactive waste and mitigate proliferation risk to a much lesser degree than anticipated from more advanced technologies.” While the evolutionary technologies could allow the DOE to begin recycling a large amount of spent fuel sooner than under its original approach, the report continues, fully meeting GNEP’s waste reduction and nonproliferation objectives would require a later transition to more advanced technologies.

According to the report, the DOE acknowledged the limitations of the accelerated approach, but cited other benefits, such as the potential to exert more immediate international influence on nonproliferation issues.

The report can be found on the Internet at www.gao.gov.

U.K. Begins Process to Select Radioactive Waste Disposal Site

A white paper published in the United Kingdom in mid-June lays out the principles by which that country will site and construct a disposal facility for intermediate- and high-level nuclear waste. The white paper, “Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal,” said that principles of “voluntarism and partnership” will be used in the site selection process.

The proposed facility would be a deep geologic site where groundwater flow is minimal and solid rock formations provide an immovable barrier between the waste and the environment. The exact design would be determined based on the site chosen, as well as on the current and projected inventory of wastes that will need disposition.

Communities across the country have been invited to express an interest in hosting the facility on a no-commitment basis. According to the white paper, these communities have the right to withdraw from the process at any point up to the construction stage; they would receive financial assistance to pay for their part in the site selection process. Once a site is selected, the surrounding community will benefit from the jobs and infrastructure the facility would generate, as well as from a benefits package that would be created for the community.

The Nuclear Decommissioning Authority (NDA), which is responsible for decommissioning the country’s nuclear power reactors and nuclear research facilities, is to take the lead on the siting process, while continuing to conduct research on nuclear waste management. The Radioactive Waste Management Directorate, an arm of the NDA, will be responsible for the actual disposal project.

DOE Ready to Discuss Spent Fuel Contracts for New Reactors

In early June, the U.S. Department of Energy began notifying companies interested in constructing new U.S. nuclear power reactors that it is ready to discuss new standard contracts for disposal of spent fuel from those units. Unlike current contracts, which were outlined in a DOE regulation, these contracts will be negotiated individually with utilities.

The new contracts would not contain a date by which the DOE would begin disposing of spent nuclear fuel. The existing contracts, which stipulated that the DOE will begin taking possession of spent fuel by January 31, 1998 (the date specified in the 1982 Nuclear Waste Policy Act), have been the cause for a multiplicity of lawsuits against the agency for failure to take the fuel.

A generating company building a new reactor must have a spent fuel disposal contract in hand before the U.S. Nuclear Regulatory Commission can issue a license.

Low-Level Waste in the News

- After Utah Governor Jon Huntsman said he would try to block the import of low-level radioactive waste from Italy destined for processing in Tennessee and disposal at EnergySolutions’ Clive, Utah, LLW disposal site, EnergySolutions responded by filing a declaratory judgment action in the U.S. District Court in Utah. Governor Huntsman was planning to use the authority of the Northwest Interstate Low-Level Radioactive Waste Management Compact to block the import of any foreign waste into Utah. EnergySolutions, however, has asked the courts for a determination that the Northwest Compact lacks authority over EnergySolutions’ Clive facility. Specifically, the court action seeks declaration that the Northwest Compact does not have regulatory authority over the Clive facility, which is a private commercial facility rather than a regional facility created by the Compact; that the U.S. Constitution does not allow the Northwest Compact to discriminate between identical domestic and foreign materials handled at the Clive facility; and that any effort by the Northwest Compact to restrict receipt of international LLW is preempted by federal statutes and regulations. EnergySolutions has a pending application with the U.S. Nuclear Regulatory Commission to import LLW nuclear material from Italy and process it at the Bear Creek facility in Tennessee and dispose of a small amount of Class A material at Clive. The NRC granted the company a similar import license in 2006.

● In late May, the U.S. Nuclear Regulatory Commission issued updated guidance to its fuel cycle and materials licensees regarding the potential need to store some low-level radioactive waste onsite for an extended period after the low-level waste disposal facility in Barnwell, S.C., closes to waste generators in much of the nation. The closure of Barnwell will leave licensees in 36 states with no disposal options for Class B and C waste. About 95 percent of B/C waste is generated by nuclear power plants, which have the space, expertise, and experience needed to store radioactive wastes for extended periods. The re-

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mainder of the B/C waste consists primarily of liquid wastes from radiochemical producers and sealed radioactive sources from industrial, research, or medical licensees. These licensees are the intended audience of the NRC's update guidance. While some of these licensees may have some experience in storing radioactive waste for short periods, the need for extended interim storage may present new challenges. These are addressed in the guidance.

The guidance advised licensees to consider ways to minimize the production of B/C wastes, and to consider whether they may need to seek a license amendment to increase their possession limit for radioactive materials as a result of the need to keep waste onsite. The guidance also addresses such issues as security, worker safety, and the need to keep track of radioactive materials, including during emergencies.

The full guidance statement, NRC Regulatory Issue Summary 2008-12, "Considerations for Extended Interim Storage of Low-Level radioactive Waste by Fuel Cycle and Materials Licensees," is available on the Internet at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/reg-issues/2008/index.html>.

● State regulators in Texas have given the go-ahead for the disposal of radioactive by-product material at the Waste Control Specialists (WCS) Andrews County disposal facility. The new license will allow WCS to permanently dispose of by-product material, which the company describes as residues left over from uranium mining, including uranium or thorium mill tailings as well as equipment, pipes, and other materials used to handle and process mill tailings. WCS is still awaiting a license for the disposal of Texas Compact low-level waste at the facility.

Hanford Cleanup Status Updates

● A Washington State law designed to stop the federal government bringing more waste to the Hanford site for disposal until cleanup work at the site is complete has been overturned by the U.S. Court of Appeals. The Court ruled that the state's Cleanup Priority Act, which prevented the U.S. Department of Energy from shipping waste from other cleanup sites for disposal at Hanford's waste disposal facilities, infringes federal rules applying to radioactive wastes and the DOE's ability to dispose of it.

● Truck drivers at the River Corridor Closure Project have logged more than 12 million miles transporting 7.3 million tons of contaminated soil and building debris for disposal at Hanford's Environmental Restoration Disposal Facility (ERDF). The project is managed by Washington Closure Hanford for the U.S. Department of Energy's Richland Operations Office. An average of 150 truckloads of contaminated soil and debris are transported each day from across the 586-square mile site. Since the ERDF opened in 1996, drivers have had only one at-fault accident. Washington closure employs 38 drivers, seven mechanics, and two tire and lube workers.

International Briefs

- Construction has begun on Germany's low- and intermediate-level radioactive waste repository at the former Konrad iron mine. The licensing process for the repository began more than 25 years ago, in 1982, and was marked by numerous interventions. Even today, some legal objections to the project are still pending and must be decided by German's constitutional court, but these cases will not postpone construction of the facility. The license for the facility was issued by the state government in Lower Saxony in 2002. The repository should be completed and ready to take waste in 2014, at a cost of some €900 million (\$1.4 billion).
- Residents of the two communities that are candidates to host Sweden's spent fuel repository are showing strong support for the facility. In an April poll, some 83 percent of respondents from Oskarshamn and 77 percent of those in Osthhammar supported their community's being chosen to host the repository. Both numbers are up from a 2006 poll, which showed 79 percent support in Oskarshamn and 73 percent support in Osthhammar. Both communities host other nuclear facilities. This year's poll also questioned residents in neighboring communities, and found that while the majority of residents in those areas were in favor of a repository being sited in their neighboring communities, support for the project decreased with distance from the proposed site.
- Posiva, the company in Finland responsible for final disposal of spent fuel from the country's nuclear reactors, is planning ahead, in view of Finland's expanding nuclear power program. In a May submission to the Ministry of Employment and the Economy, Posiva detailed how it wants to develop an environmental impact assessment on expanding the future size of its repository by an additional 3000 tonnes (to 12 000 tonnes) to accommodate fuel from Olkiluoto-4 and Loviisa-3, reactors still in the planning stage. Olkiluoto-3 is currently under construction in Finland.
- Norway's Institute for Energy Technology (IFE) has been granted a new four-year concession to operate the country's low- and medium-level waste repository. The original 10-year concession was granted to IFE in 1998, when the facility opened. The concession time is changing to four years to allow for more regular competitive bidding, the Norwegian Ministry of Health and Care Services said.
- The European Bank for Reconstruction and Development (EBRD) has agreed to donate 10 percent of its 2007 profits to support the international cleanup at the Cher-

nobyl site in Ukraine. In 2007, the bank's profits totaled €1.1 billion (\$1.7 billion). Of that, €135 million (\$212 million) has been allocated to the cleanup of Chernobyl. This decision is in line with two key contracts signed in September 2007 to speed cleanup of the site, the location of the world's worst civilian nuclear power accident in 1986. One contract was for the construction of the New Safe Confinement, a structure that will be built over the damaged Chernobyl-4 building. The second contract is for the completion of the Interim Storage Facility, to contain spent fuel from Units 1, 2, and 3 at the site. Final designs for both facilities are scheduled to be submitted to Ukrainian regulators in Spring 2009.

Also at Chernobyl, in late April, the last of the nuclear fuel was removed from Chernobyl-3. The defueling of Unit 3, which shut down in 2000, will allow decommissioning of the unit to move to the next phase of dismantlement of equipment and systems no longer in use.

- A new spent fuel pool at Switzerland's Gösgen nuclear power plant has been given permission to operate by the Swiss Federal Nuclear Safety Inspectorate. The new wet storage facility can accommodate 1008 spent fuel assemblies, nearly tripling the spent fuel storage capacity at the plant.

- A consortium of British universities has received £4.3 million (\$8.4 million) in funding to conduct a four-year program to study ways to manage and dispose of the United Kingdom's radioactive wastes. The consortium, known as Diamond (from Decommissioning, Immobilization And Management Of Nuclear wastes for Disposal), is led by the University of Leeds and includes the Universities of Manchester, Sheffield, Imperial College, Loughborough, and University College London. The funding came from the Engineering and Physical Sciences Research Council. The study will research such issues as legacy wastes, site termination, contamination migration, and materials design and performance. Researchers will work closely with the U.K. Nuclear Decommissioning Authority and industry stakeholders ensure that their research addresses relevant issues.

- After a two-year break in the planning process, Dounreay Site Restoration Ltd. (DSRL) is again seeking permission from the Scottish Environmental Protection Agency to construct a series of shallow engineered vaults at the Dounreay site for disposal of some 175 000 cubic meters of solid low-level waste from the cleanup of the former fast reactor and specialized fuels site in northern Scotland. DSRL has said it would like to see the facility in operation by 2014. ■