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Texas Compact Commission Votes to Accept Out-of-Compact LLW

In early January, the Texas Low-Level Radioactive Waste Compact Commission voted in favor of allowing 36 other states (those states with no access to any other disposal option for their Class B and C low-level waste) to dispose of their waste at the Waste Control Specialists (WCS) site in Andrews County, Texas. The vote was 5–2 in favor of the proposal. The commission also guaranteed that 20 percent of the capacity of the WCS facility would be reserved for waste from the state of Vermont. This will allow enough space for the decommissioning waste from Vermont Yankee when that plant shuts down.

The decision requires the Texas commission to rule on petitions from other states to take their waste on a case-by-case basis.

The decision is expected to face court challenges before it can be implemented. When it is finally implemented, it will mean that LLW generators throughout the country will have disposal options for their Class B and C waste, which many have not had since the Barnwell, S.C., disposal facility closed its doors to out-of-compact waste in the middle of 2008.

The first phase of construction of a disposal facility at the WCS site should be completed at the end of this year.

Southeast Compact Commission Approves Resolutions Related to Mission, Duties

In early December, the Southeast Radioactive Waste Compact Commission adopted two resolutions.

In the first resolution, the commission voted unanimously "that its mission and duties as stated in the compact law, continue to be appropriate, necessary, and worthy of pursuit."

In the second resolution, also approved unanimously, the commission concurred with the statement that "the Southeast Compact Commission concludes that, with the exception of certain provisions related to facility site development, the Southeast Compact law is enforceable and provides the authority needed for the Commission to fulfill its mission and duties, including developing an alternative approach to site development."

The commission's resolutions are in response to the June 1, 2010, U.S. Supreme Court decision in the lawsuit, *Alabama et al v. North Carolina.* (See *Radwaste Solutions,* July/August 2010, p. 7.)

According to Michael H. Mobley, chairman of the commission, "The Supreme Court ruling brought the commission to a new crossroads in its history. The decision raised fundamental questions about the enforceability of the compact law, the powers and authority of the commission, and the commission's ability to fulfill its mission and duties. Today's resolutions answer those questions and allows the commission to move forward with fulfilling its mission."

The Southeast Compact for Low-Level Radioactive Waste Management is an agreement among six states (Alabama, Florida, Georgia, Mississippi, Tennessee, and Virginia) to provide for the responsible management of the region's low-level radioactive waste. North Carolina was a member of the compact from 1983 until it withdrew in 1999.

EPRI: Early Movement of Spent Fuel to Dry Storage Will Cost You

According to a report released in November by the Electric Power Research Institute (EPRI), moving spent fuel into dry storage after only five years of cooling would result in a net present value cost increase of $3.6 billion, compared to current practice.

The threat of terrorist activities at nuclear power plants has led some to recommend that spent fuel be moved to dry storage "early," that is, after five years of cooling in the spent fuel pool. An EPRI study evaluated the economic, radiological, and other impacts of such a change in spent fuel handling practices. The resulting report, "Impacts Associated with the Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years

of Cooling" (1021049), notes that such a cost increase would be primarily related to the additional capital costs for new casks and construction costs for the dry storage facilities. (Early movement was compared to a base case of the current practice scenario, in which nuclear plants load spent fuel into dry storage only as necessary to accommodate fuel assemblies being removed from the core during refueling outages.) The increase in net present value costs is $92 million–$95 million for a representative two-unit pressurized water reactor, $18 million–$20 million for a representative single-unit boiling water reactor, and $22 million–$37 million for a representative single-unit new plant.

The early movement of spent fuel into dry storage would also have significant radiological impacts, the report stated. Worker radiation exposure would increase by an estimated 507 person-rem over 60 years because of the additional handling of spent fuel. Moreover, an additional 711 dry storage packages would have to be handled compared to the base case, increasing the risks associated with cask handling and with the construction of additional dry storage systems.

In addition, the report noted, manufacturing and fabrication capabilities would be taxed by the early transfer of spent fuel. The three- to four-fold increase in dry storage system fabrication capability would require increased U.S. Nuclear Regulatory Commission inspection and oversight of cask designers, fabricators, and dry storage loading operations. In addition, more than 20 nuclear power plants would have to load more than 15 dry storage systems annually—representing a two- to four-fold increase in the rate of cask loading—placing pressure on spent fuel pool cranes and other systems during routine operations and outages.

WIPP Receives EPA Recertification, State Permit Renewal

The U.S. Department of Energy's Waste Isolation Pilot Plant achieved a key milestone in mid-November when it was recertified by the U.S. Environmental Protection Agency. This means that the EPA, after a thorough review, concluded that the underground repository continues to display its ability to safely contain transuranic waste for the duration of WIPP's 10 000-year regulatory period.

The EPA initially certified the site in 1998. The recertification process with the EPA takes place every five years, as stipulated in the WIPP Land Withdrawal Act. This marks the second time that WIPP has been recertified since its opening in 1999.

Shortly thereafter, at the end of November, the facility received its Hazardous Waste Facility Permit renewal from the New Mexico Environment Department. This permit must be renewed every 10 years, so this was the first time that WIPP has received a permit renewal, which allows it another 10 years of operation.

D&D Updates

- In the last few weeks of 2010, the Hanford Vitrification Plant celebrated the arrival of two 125-ton melter assemblies that will be staged in the Low-Activity Waste (LAW) Vitrification Facility, as well as the 30-ton melter shield lids. In addition, two shield doors, destined for the Pretreatment Facility, were delivered to the site. The LAW facility is now 65 percent complete, while the Pretreatment Facility is 47 percent complete.
- Demolition of the Oak Ridge K-33 building was expected to begin in January 2011, with a completion date of around January 2012. At its peak, the project is expected to employ around 200 workers. The 1.4-million-square-foot K-33 building once housed gaseous diffusion equipment used to enrich uranium during the Cold War era. The project is being funded in part by American Recovery and Reinvestment Act monies.
- New cleanup deadlines for the Hanford Site have been agreed among the U.S. Department of Energy, the Washington State Department of Ecology, and the U.S. Environmental Protection Agency. Among the key points of the agreement are the establishment of pacing milestones to keep construction of the Waste Treatment Plant on schedule; completing the retrieval of single-shell tanks in Hanford's C Farm in 2014; treatment of tank waste beginning in 2019, with full operations beginning in 2022; completing the retrieval of all single-shell tanks in 2040; completing the treatment of tank waste in 2047; and closing the double-shell tank farms in 2052.

In addition, the DOE and the state of Oregon have also agreed upon a consent decree that recognizes Oregon's interest in the cleanup effort and provides Oregon the right

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to receive copies of certain reports and notices, the right to participate as an observer in joint three-year reviews, and prior notice of any motion to modify the consent decree with Washington State.

● The Savannah River Site has celebrated the completion of cleanup work at the M Area, nearly two years ahead of schedule. This area cleanup was the first at SRS to be completed with the help of American Recovery and Reinvestment Act (ARRA) funding. The work was part of a $1.6-billion investment of ARRA funds at SRS to accelerate cleanup and reduce the site's footprint by 75 percent by 2011. The cleanup effort included the demolition of 23 buildings, as well as remediation of a network of underground industrial piping and sewer lines, soil areas, and groundwater plumes that were contaminated from past spills and operations. M Area, which operated from 1952 to 1988, was originally home to manufacturing buildings that were used primarily for testing and fabrication of reactor fuel and targets. The cleanup of this area means that 40 square miles near the northwest boundary of SRS could become available for possible industrial reuse.

● In November, the U.S. Department of Energy and the U.S. Nuclear Regulatory Commission announced that nearly 60 kilograms of spent nuclear fuel has been removed from an NRC-licensed research reactor located near San Diego, Calif. The fuel was removed from a reactor that conducted government-sponsored research for nearly 40 years, beginning in the late 1950s. When it was built, the reactor was located in a remote and isolated area, but suburban sprawl around San Diego has since surrounded the once-isolated location. The fuel, consisting of 19.7 kg of highly enriched uranium and 37 kg of low-enriched uranium, was transported to a secure federal facility.

● Savannah River Nuclear Solutions LLC, the U.S. Department of Energy's cleanup contractor at the Savannah River Site, surpassed an important milestone for the 2010 fiscal year by shipping 24 shipments of low-enriched uranium (LEU) to the Tennessee Valley Authority, exceeding their goal by 4 shipments. Since 2003, SRS has downblended, or diluted, more than 20 metric tons of highly enriched uranium to LEU to create fuel rods for commercial power reactors. The cost-savings from using this material (in place of fresh uranium) are split between TVA ratepayers and the U.S. Treasury.

● More than 30 miles of railroad track being removed from the Hanford Site's River Corridor is going to receive

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a second life. A contract with Trinity Environmental and Deconstruction allows the company to receive the rail (for reuse) in return for the service of removing the rail. The Hanford site has more than 110 miles of track, only a fraction of which is still in use. In all, some 5000 tons of track are being removed as part of the final cleanup in some areas of the site.

● Last October, at the U.S. Department of Energy's Savannah River Site, workers removed two exhaust stacks from the site's P and R reactors. With less than 40 pounds of dynamite and in a matter of seconds, the two 145-foot tall, 700-ton stacks that have towered over the P and R reactors for more than 50 years came tumbling down. The demolition was part of a $185-million American Recovery and Reinvestment Act project that is decommissioning the two Cold War–era reactors. The project employed 108 people to complete the stack demolition. The rubble from the stacks will be placed below grade and grouted in place at each of the reactors.

● A new type of radiation detection and measurement device that may be particularly useful in the cleanup of radioactively contaminated sites has been invented at Oregon State University, in Corvallis, Ore. The radiation spectrometer, developed over a 10-year period by David Hamby, an OSU professor of health physics, and Abi Farsoni, an assistant professor in the College of Engineering, can quickly tell the type and amount of radionuclides that are present in something like a soil sample, and it can distinguish between gamma rays and beta particles, which is necessary to determine the level of contamination. A patent has been granted for the spectrometer, and the first production of the device will begin soon. The advance has also led to the creation of a Corvallis-based spinoff company, Avicenna Instruments.

● The U.S. Department of Energy has hit URS subsidiary Washington Group International (WGI), the cleanup contractor at the Knolls Atomic Power Laboratories, with a $1.8-million fine because of poor performance that caused radiation leaks into the air and the Mohawk River. The penalty will come out of the potential $7.6 million maximum bonus that the company could earn under its $69-million contract to demolish two Cold War–era buildings at the site that have been closed since 1952. Excessive radiation levels were discovered in late September/early October at various locations on the site, and in late October, about 630 gallons of radiation-contaminated waster spilled

into the Mohawk River from a malfunctioning drainage system. Demolition work was halted on November 19 and was to remain stopped while the DOE considered a corrective action plan filed in December by WGI. WGI has also informed the DOE that it may not be able to finish the project as planned by September 2011.

● The U.S. Department of Energy Richland Operations Office is making available the River Corridor Baseline Risk Assessment (RCBRA): Vol. II: Human Health Risk Assessment (Draft C). This technical document provides a comprehensive human health risk assessment for the Hanford River Corridor that considers relevant sources of contamination, exposure pathways, and contaminants to evaluate current and potential risks posed by hazardous substance releases. Volume II will be used, along with the ecological risk assessment (Volume I currently under development), to support final River Corridor cleanup decisions. The results from this baseline risk assessment and other information will be used to develop final cleanup decisions that will be protective of human health and the environment. Cleanup alternatives will be evaluated in future proposed plans that will go out for public review and comment. Final cleanup decisions will be documented in records of decision. The document can be viewed at http://www.hanford.gov under Hanford Events Calendar.

International Briefs

● Funding for nuclear decommissioning in the United Kingdom appears to be unaffected by the deep cuts in public spending that have resulted from the country's new austerity program. While such areas as defense and welfare have been particularly hard hit, the country's nuclear industry appears to be relatively safe. The annual £3 billion ($4.6 billion) decommissioning budget is primarily publicly funded. Total liabilities for the U.K. Nuclear Decommissioning Authority are around £76.5 billion (around $119 billion).

In related news, at the end of the year, the U.K. government issued a draft document outlining how operators of any new nuclear facility can expect to pay for waste and decommissioning. Under the waste framework developed, operators can expect to pay a "waste transfer" fee when they relinquish ownership of waste to the government, which is ultimately responsible for waste disposal. This

fee is being set high enough to protect the U.K. taxpayer from the risk of accidentally subsidizing the cost of new nuclear. The maximum possible price will be capped (at about three times the best estimate for the actual costs of waste disposal) so as to provide operators with a level of certainty and to encourage adequate investment into new nuclear. The cap represents the upper boundary of what operators will pay for waste disposal.

● In December, Germany called off plans to return spent highly enriched uranium fuel to Russia, a little more than a month after radioactive waste shipments from France to Gorleben drew some 25 000 protesters. The 951 spent fuel assemblies from the Rossendorf research reactor, located in what once was East Germany, were to be shipped back to the Mayak complex in Russia, but German Environment Minister Norbert Roettgen refused to grant permission for the transport. The Rossendorf reactor operated between 1957 and 1991. Its spent fuel is stored at the Ahaus interim storage facility. The return of the Rossendorf fuel is mandated by a 2004 contract between Germany, Russia, and the International Atomic Energy Agency.

● Two Magnox reactors at the Berkeley nuclear station in the United Kingdom became the first in that country to be sealed, in a major decommissioning milestone. The two reactors have been placed in SAFSTOR and will be monitored and maintained until the site is completely cleared, in about 65 years' time. The two reactors went into service in 1962 and were shutdown in the late 1980s. Defueling took place between 1989 and 1992, which resulted in 99 percent of the radioactivity being removed from the site.

● Seven cobalt-60 sources have gone missing from a former iron foundry in Poland, and the country has issued a "wanted" poster to retrieve them, highlighting the importance of controlling radioactive materials. The seven sources range in activity from 9 to 20 megabecquerels, and are not considered hazardous as long as they remain in their PrJ20 container, which weighs some 40 kilograms. The missing sources have been classed as Category 4 in the International Atomic Energy Agency's events system, that is, very unlikely to be sufficient to cause permanent injury, although possibly enough to temporarily injure someone who came into contact with it if not managed safely or securely protected.

● Canada's Bruce Power will wait until the spring to ship 16 used steam generators to Sweden. The company is awaiting a decision from the Canadian Nuclear Safety

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Commission on its application to transport the generators from the power plant site through the Great Lakes and the St. Lawrence Seaway, then across the Atlantic Ocean to Sweden. Bruce Power will also need approvals from agencies in the United States and Sweden. The generators will be going to the Studsvik works in Sweden for treatment and recycle. Up to 90 percent of the steel in the generators should be able to be recycled; the rest will be returned to Bruce Power as low-level waste.

● In November, the European Commission released its proposed nuclear waste directive, which instructs European Union members states to develop plans to dispose of radioactive waste in safe repositories. The directive does not, however, deal with the issue of forcing government to use deep underground repositories, although this is clearly the commission's preferred option. "Geological conditions are very different. This is why it is up to the member states to define the depths according to the site specific situation. Every site must be evaluated according to its specific situation," states a commission memorandum. The memorandum continues: "It is broadly accepted at the technical level that deep geological disposal represents the safest and most sustainable option as the end point of the management of high level waste and spent fuel considered as waste." The directive would allow two or more member states to share a repository, although they could not export nuclear waste outside the EU for final disposal. Public consultation would also be required. The directive must be approved by the EU Council of Ministers and the European Parliament.

● Lightweight foaming grout is being used at the Sellafield site in its decommissioning work. Similar grouts have been used to backfill mines and voids, but its use in nuclear decommissioning is considered novel. The grout was successfully used to fill the HANO cell in the former Primary Separation Plant. The grout stabilizes the internal vessels and pipework in the cell, and mitigates a significant safety risk of having vessels collapse in the cell; according to Sellafield officials, it leaves the cell in a fit state for care and maintenance pending full decommissioning. ■