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The United States, like all countries, faces challenges associated with ensuring its people have access to affordable, abundant, and environmentally friendly sources of energy. President Obama continues to make addressing climate change a priority and the Administration has set a goal of reducing carbon emissions by 80 percent by 2050. Nuclear power can play an important role in achieving this goal. As the President noted in Korea last spring, "in the United States, we've restarted our nuclear industry as part of a comprehensive strategy to develop every energy source."

Nuclear power has reliably and economically contributed almost 20 percent of electrical generation in the U.S. over the past two decades. It remains the United States' single largest contributor (more than 60 percent) of non-greenhouse-gas-emitting electric power generation. Currently, we have five new commercial nuclear reactors under construction, including four AP1000 reactors which are passively safe nuclear plants.

The United States must develop a used nuclear fuel management and disposal strategy to ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security. Because acceptance of used nuclear fuel did not begin in 1998, as mandated by the Nuclear Waste Policy Act, a substantial cost has been presented to the taxpayers to reimburse utilities for the cost of ongoing storage that are directly related to this delay.

Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste

Finding a solution to managing and disposing the nation's high-level radioactive waste and used nuclear fuel is a long-standing challenge. Such a solution, however, is necessary to assure the future viability of an important carbon-free energy supply and further strengthen America's standing as a global leader on issues of nuclear safety and nonproliferation.

In FY 2010, the Secretary of Energy established the Blue Ribbon Commission on America's Nuclear Future (BRC, or the Commission) composed of experts from government, academia and industry. The charter charged the Commission with conducting a "comprehensive review of policies for managing the back end of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel, high-level waste, and materials derived from nuclear activities… [and to] provide advice, evaluate alternatives, and make recommendations for a new plan to address these issues." The Commission issued its final report on January 26, 2012.

In January 2013, the Department released the Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*, which endorses key principles of the Commission's report. The Strategy lays out plans to implement, with the appropriate authorizations

from Congress, a long-term program that begins operations of a pilot interim storage facility by 2021, advances toward the siting and licensing of a larger interim storage facility by 2025, and makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.

The Strategy addresses several important needs. First, it serves as a statement of Administration policy regarding the importance of addressing the disposition of used nuclear fuel and high-level radioactive waste; it lays out the overall design of a system to address that issue; and it outlines reforms needed to implement such a system. Second, it presents the Administration's response to the final report and recommendations made by the BRC. It also responds to direction in the Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2012, to develop a strategy for the management of used nuclear fuel and nuclear waste in response to the BRC's recommendations. Third, this strategy represents an initial basis for discussions among the Administration, Congress and other stakeholders on a sustainable path forward for disposal of nuclear waste.

As noted, the Administration's Strategy endorsed the concept of the development of three different, but intimately related, facilities. While the Strategy indicates one of each of three separate facilities and sites, it is conceivable, as the result of a consent-based siting process, that some or all of these facilities could be co-located and/or more than one of each type could be constructed. First, consistent with legislation recently under consideration in Congress, the Administration supports the development of a pilot interim storage facility with an initial focus on accepting used nuclear fuel from shut-down reactor sites. Acceptance of used nuclear fuel from shut-down reactors provides a unique opportunity to build and demonstrate the capability to safely transport and store used nuclear fuel, and therefore to make progress on demonstrating the federal commitment to addressing the used nuclear fuel issue. In addition, a pilot facility could also take defense wastes to demonstrate commitment and progress in addressing the legacy of the Cold War. A pilot would also build trust among stakeholders with regard to the consent-based siting process and commitments made with a host community for the facility itself, with jurisdictions along transportation routes, and with communities currently hosting at-reactor storage facilities.

Second, beyond a pilot-scale facility, the Administration supports the development of a larger consolidated interim storage facility with greater capacity and capabilities that will provide flexibility in operation of the transportation system and disposal facilities. A larger-scale facility could take possession of sufficient quantities of used nuclear fuel to make progress on the reduction of long-term contractual liabilities and could also accept defense wastes.

Finally, there is international consensus that geologic repositories represent the best known method for permanently disposing of used nuclear fuel and high-level radioactive waste, without putting a burden of continued care on future generations. The Administration agrees that the development of geologic disposal capacity is currently the most cost-effective way of permanently disposing of used nuclear fuel and high-level radioactive waste while minimizing the burden on future generations. As noted by the BRC, the linkage between storage and disposal is critical to maintaining confidence in the overall system. Therefore, efforts on implementing storage capabilities within the next 10 years will be accompanied by actions to engage in a consent-based siting process and begin to conduct preliminary site investigations for a geologic repository.

No matter how many facilities or what specific form they take, a consent-based approach to siting is critical to success. The Administration supports working with Congress to develop a consent-based

process that is transparent, adaptive, and technically sound. The BRC emphasized that flexibility, patience, responsiveness and a heavy emphasis on consultation and cooperation will all be necessary in the siting process and in all aspects of implementation. Experiences in other countries indicate that a consent-based process – developed through engagement with states, tribes, local governments, key stakeholders, and the public – offers a greater probability of success. For example, Sweden and Finland have successfully executed programs to select a site among multiple volunteers. Others such as France, Switzerland, and Canada, have programs underway that appear to be demonstrating some success. DOE is currently evaluating critical success factors in the siting of nuclear facilities in the U.S. and abroad to facilitate the development of a siting process.

The strategy highlights the need for a new waste management and disposal organization to provide the stability, focus, and credibility to build public trust and confidence. Again, there are multiple models that exist along a continuum from a government program to federal corporations – entities that report to a cabinet secretary and those that have their own board of directors that report independently to the President. A study commissioned by DOE and conducted by RAND Corporation found that a government corporation and an independent government agency are two models that appear workable for waste management. Whatever form the new entity takes, organizational stability, an appropriate level of autonomy, leadership continuity, oversight and accountability, and public credibility are critical attributes for future success. Further, the authorities and responsibilities of the new organization are more important than the specific form. The Administration will work with Congress to ensure that the authorization of any new body established for this purpose provides adequate authority and leadership as well as appropriate oversight and controls.

The Administration also recognizes that providing adequate and timely funding is critical to the success of the nuclear waste mission. The Strategy proposes a funding program that contains three critical elements: discretionary appropriations within existing spending caps to pay for regular and recurring activities; legislative reclassification of annual fee income from mandatory to discretionary or a direct mandatory appropriation to make dedicated funds available in sufficient amounts without competing with other government priorities; and eventual access to the existing balance of the Nuclear Waste Fund in the Treasury. Within this approach are many variations that we believe can achieve the needed balance between adequate and timely access to funds and oversight and accountability by Congress and the Executive branch. It should be noted that this proposal does not fund licensing activities for the previous geologic disposal program. Whether discretionary or mandatory spending is ultimately approved, this approach is not a “blank check” for waste management activities and we look forward to working with Congress on crafting a meaningful approach.

Full implementation of this program will require legislation to enable the timely deployment of the system elements noted above. The Administration has put forward a comprehensive proposal, but is also committed to working with Congress on the specifics of this important issue. In the meantime, the Administration, through NE, is undertaking activities within existing Congressional authorizations to plan for the eventual transportation, storage, and disposal of used nuclear fuel.

Ongoing Activities

The Blue Ribbon Commission noted the need for near-term actions that can lay the groundwork for the next generation of nuclear waste policies and programs. It included in its recommendations:

- Continuation of a research and regulatory oversight effort in used fuel and storage system degradation phenomena, vulnerability to sabotage and terrorism, and others.
- Moving forward with geologic disposal through valuable, non-site specific activities, including R&D on geological media, work to design improved engineered barriers, and work on the disposal requirements for advanced fuel cycles.
- Development of a research, development, and demonstration plan and roadmap for taking the borehole disposal concept to the point of a licensed demonstration.
- Performance of system analyses and design studies needed to better integrate storage into the waste management system, including standardization of dry cask storage systems and development of a conceptual design for a spent fuel storage facility.
- Development of a database to capture the experience and knowledge gained from previous efforts to site nuclear waste facilities in the United States and abroad.
- Completion of policies and procedures for providing technical assistance funds to states, tribes, and local jurisdictions which are likely to be traversed by transportation shipments.

DOE is currently undertaking activities to address these recommendations. For example, DOE is working with industry to conduct R&D (lab, field, and modeling) to further develop the technical bases for continued safe storage. Specifically, a key element of the storage R&D is to implement, on a cost-sharing basis with industry, a full scale storage demo project focused on getting full scale, field information on the long term storage of high burn-up fuel. This demo project is in the final steps of the DOE procurement process, and the contract should be awarded by the end of this month. The initial output will be a test plan, to be put forth for public comment, which will within a few years lead to a more highly instrumented storage system than that which is typical at a utility site, using the utility's fuel, under the utility's NRC license.

DOE is also working to analyze the capabilities of various geologic media that had not been looked at since the decision to focus on Yucca Mountain. This will help show that there is a sound technical basis for disposal in the US in different geologic media, and will help provide confidence in whatever future decisions are made. DOE is taking advantage of existing analysis related to different geologic settings at disposal sites in other countries to help leverage expertise and minimize costs.

With regard to borehole disposal, DOE is developing a draft plan and roadmap for a deep borehole demonstration project. The demonstration would evaluate the safety, capacity, and feasibility of the deep borehole disposal concept for the long-term isolation of nuclear waste. It would serve as a proof of principle, but will not involve the disposal of actual waste. The demonstration would evaluate the feasibility of characterizing and engineering deep boreholes, evaluate safe processes and operations for safe waste emplacement and evaluate geologic controls over waste stability.

In FY 2012, DOE initiated system-level analyses for the overall interface between at-reactor, consolidated storage and disposal, including the development of supporting logistic simulation tools to better understand aging of fuel, loading requirements, and opportunities for use of standardized canisters. In addition, DOE acquired services of industry to develop design concepts for an interim storage facility and is evaluating their submissions in FY 2013.

A database on experiences with siting radioactive materials facilities both in the U. S. and abroad has been developed that will be a public resource and will inform the planning process. A report on the findings of the initial studies and an examination of case studies in the data base of siting experience is being prepared and will be available this summer. Consistent with the BRC's report, social science studies are being conducted to assess public attitudes towards aspects of siting and transporting radioactive materials, changes in public perception over time, and drivers for any changed perceptions.

For transportation planning and engagement with stakeholders, DOE has convened a Working Group under the auspices of the National Transportation Stakeholders Forum (NTSF - comprised of Federal, State, and Tribal governmental representatives) to address training-related issues and develop a revised policy for preparing public safety officials along proposed transportation routes, as required by Section 180(c) of the Nuclear Waste Policy Act. The Working Group will analyze and, when possible, make recommendations on specific issues related to Section 180(c) policy and implementation.

The President's Fiscal Year 2014 Budget Request

The President's FY 2014 budget request includes a multi-part proposal to move ahead with developing the nation's used nuclear fuel and high-level waste management system outlined in the Administration's Strategy. First, it lays out a comprehensive funding reform proposal. As described in the Strategy, the Administration's proposal includes three elements for funding reform: ongoing discretionary appropriations, reclassification of existing annual fees from mandatory to discretionary or a direct mandatory appropriation, and access to the balance of the nuclear waste fund. Included in the amounts that would be made available under this proposal, are defense funds to pay for the management and disposal of government-owned wastes within the overall system.

The Administration believes an ongoing role for the Appropriations Committees of Congress is a key component of oversight of the waste management mission going forward. Therefore, ongoing discretionary appropriations within existing funding caps are included in the proposal in amounts up to $200 million per year, starting at modest levels in the near term and increasing as planning, management, and regulatory activities increase. In addition to these amounts, the proposal includes access to amounts needed above $200 million to pay for the design and construction of storage facilities as well as execute a robust siting process for a geologic repository.

In total, the Administration proposes $5.6 billion in spending to implement the strategy over the next 10 years. Up to $1.8 billion of this would be within existing spending caps, while the remaining $3.8 billion would be funding from the Nuclear Waste Fund's annual fees, use of balance of the Nuclear Waste Fund, and defense funds. To offset the "pay-as-you-go" score, the government intends to accept used nuclear fuel from shutdown reactors within the 10-year budget window, triggering payment of one-time fees owed the government from utility contract holders in the amount of approximately $2.5 billion. This results in a net score of approximately $1.3 billion. The proposal balances access to the fees dedicated to the nuclear waste mission with oversight from Congress and the Executive branch, while supporting implementation of a system with achievable goals.

Second, for the first time, the Budget baseline reflects a more complete estimate of potential future costs of the liability associated with continuing to pay utilities based on the Government's liability for partially breaching its contract to dispose of used nuclear fuel. The cost of the Government's growing liability for partial breach of contracts with nuclear utilities is paid from the Judgment Fund of the U.S. Government. While payments are extensively reviewed by Department of Energy, and must be authorized by the Attorney General prior to disbursement by the Department of the Treasury, as mandatory spending they are not subject to Office of Management and Budget or Congressional approval. Past payments are included in full in the Budget, but until now the Budget has included only a partial estimate of the potential future cost of continued insufficient action. To improve budget projections, the baseline for the Judgment Fund in this Budget reflects a more complete estimate of potential future cost of these liabilities. By reflecting a more complete estimate of the liability payments in the baseline, costs over the life of the nuclear waste management and disposal program would eventually be offset (for the purposes of scoring against the baseline) by reductions in liabilities as the Government begins to pick up sufficient waste from commercial sites.

Third, the President's budget includes funding for the Environmental Protection Agency (EPA) to begin the review and update of generic (non-site specific) disposal standards to help guide the siting of used fuel and high-level waste facilities. Current EPA standards for all sites other than Yucca Mountain are defined under 40 CFR Part 191, "Environmental Radiation Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," and were last updated in 1993. The Administration agrees with the BRC that generally applicable regulations are more likely to earn public confidence than site-specific standards. In addition, having an updated generic standard will support the efficient consideration and examination of multiple sites.

Finally, in FY 2014, DOE, through the Office of Nuclear Energy, will support the *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Waste* by funding activities to lay the ground work for the design of an integrated waste management system as well as related research and development work. Specifically, in the used nuclear fuel research and development area, the Department will work with industry on conducting investigations into the extended storage of used nuclear fuel and the transport of such fuel under a range of cask loadings. In addition, ongoing research into alternative disposal environments, including modeling, experiments, and field tests will be continued, with a particular emphasis on salt. Finally, the Used Fuel Disposition program will undertake R&D activities to further the understanding of hydro-geochemical, physical geology, structural geology, geophysical state and engineering properties of deep crystalline rocks for deep borehole disposal.

In the management and disposal system design area, DOE will conduct system architecture and operating evaluations of various used fuel management systems, including centralized and/or regional storage facilities, various repackaging scenarios and acceptance rates. DOE will also update transportation and storage system models, and develop cost databases. Further, DOE will conduct analyses for initial used fuel shipments from shutdown reactor sites: including staffing, routing, procurement, operations, security, quality assurance, emergency response, training, logistics, site

servicing, mobilization, operational readiness, and site servicing schedules. Work will also continue on an evaluation of standardized containers for storage, transportation, and potentially disposal. Outreach activities to stakeholders on transportation planning and issues will also continue.

Closing

The Administration looks forward to working with this Subcommittee and other members of Congress on crafting a path forward for used nuclear fuel and high-level waste management and disposal. This progress is critical to assure that the benefits of nuclear power are available to current and future generations.