STRATEGY
FOR THE MANAGEMENT
AND DISPOSAL
OF USED NUCLEAR FUEL AND
HIGH-LEVEL RADIOACTIVE WASTE

JANUARY 2013

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In 2010, I chartered the *Blue Ribbon Commission on America's Nuclear Future* ("BRC" or "Commission") to conduct a comprehensive review and recommend a plan of action for the management and disposal of the nation's used nuclear fuel and high-level radioactive waste, also referred to as the back-end of the nuclear fuel cycle. Representative Lee Hamilton and General Brent Scowcroft, two distinguished individuals with decades of public service and governing experience, co-chaired the Commission and led a panel of leading scientists, nuclear energy experts, industry leaders, and former elected officials.

Nuclear power is an integral part of our "all-of-the-above" energy strategy. It provides twenty percent of our nation's electricity supply, and the Administration is promoting the safe use of nuclear power through support for new nuclear power plants incorporating state-of-the-art passive safety features as well as a cost-shared program providing technical support for licensing new small reactor designs. Nuclear energy is an important contributor to our nation's energy security, and promotes clean-energy jobs. Nuclear energy production also provides important environmental benefits by producing little carbon dioxide or conventional air pollutant emissions.

An unfailing commitment to protect public health and safety, security, and the environment is essential to ensuring that nuclear power remains part of our diversified clean-energy portfolio. As part of that commitment, safe, long-term management and disposal of used nuclear fuel and high-level radioactive waste must remain a national priority.

Beyond sustaining an important domestic energy source, progress on a disposal solution can also support the clean-up of those sites that hosted production of defense nuclear materials during the Cold War, and help advance key national-security and non-proliferation objectives. More than 40 percent of the Navy's surface and submarine combatant fleet, for example, is now nuclear-powered. The used nuclear fuel it generates likewise requires a permanent disposal solution.

Since the end of the Cold War, significant quantities of weapons-capable plutonium and highly enriched uranium have become surplus to our national security needs. Some of these nuclear materials will be modified so they can be used in reactors as fuel, but then will be destined for a repository.

Finally, global demand for nuclear energy continues to grow, with commensurate risks in terms of safety, weapons proliferation, and terrorism if this growth occurs outside a vigorous safety and security framework. America's ability to influence the mitigation of these risks is strengthened when we demonstrate the commitment and ability to perform here at home.

For nearly two years, the Commission conducted a comprehensive review and ultimately made recommendations for addressing one of our nation's most intractable challenges. Its work provides a strong foundation for development of a new strategy to manage used nuclear fuel and high-level radioactive waste. We will work with Congress to build a new national program based on this foundation.

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INTRODUCTION AND SUMMARY

The *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste* is a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel[1] and high-level radioactive waste from civilian nuclear power generation, defense, national security and other activities.

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 the reforms needed to implement such a system. Second, it presents the Administration's response to the final report and recommendations made by the *Blue Ribbon Commission on America's Nuclear Future* ("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.

The Administration endorses the key principles that underpin the BRC's recommendations. The BRC's report and recommendations provide a starting point for this Strategy, which translates many of the BRC's principles into an actionable framework within which the Administration and Congress can build a national program for the management and disposal of the nation's used nuclear fuel and high-level radioactive waste.[2] The BRC report and the Strategy build on the body of physical and social science work completed during the prior decades and benefit from the lessons learned not only from our nation's experiences, but also from those of other countries.

This Strategy includes a phased, adaptive, and consent-based approach to siting and implementing a comprehensive management and disposal system. At its core, this Strategy endorses a waste management system containing a pilot interim storage facility; a larger, full-scale interim storage facility; and a geologic repository in a timeframe that demonstrates the federal commitment to addressing the

[1] The term "used nuclear fuel" as used in the BRC charter and in this document is intended to be synonymous with the term "spent nuclear fuel" as used in the Nuclear Waste Policy Act and the Standard Contracts.

[2] The BRC recommendations are available here and are summarized as follows:

1. A new, consent-based approach to siting future nuclear waste management facilities.
2. A new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed.
3. Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management.
4. Prompt efforts to develop one or more geologic disposal facilities.
5. Prompt efforts to develop one or more consolidated storage facilities.
6. Prompt efforts to prepare for the eventual large-scale transport of used nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available.
7. Support for continued U.S. innovation in nuclear energy technology and for workforce development.
8. Active U.S. leadership in international efforts to address safety, waste management, non-proliferation, and security concerns.

nuclear waste issue, builds capability to implement a program to meet that commitment, and prioritizes the acceptance of fuel from shut-down reactors. A consent-based siting process could result in more than one storage facility and/or repository, depending on the outcome of discussions with host communities; the Nuclear Waste Policy Act of 1982 (NWPA) envisaged the need for multiple repositories as a matter of equity between regions of the country. As a starting place, this Strategy is focused on just one of each facility.

With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.

Full implementation of this program will require legislation to enable the timely deployment of the system elements noted above. Legislation should also include the requirements for consent-based siting; a reformed funding approach that provides sufficient and timely resources; and the establishment of a new organization to implement the program, the structure of which should balance greater autonomy with the need for continued Executive and Legislative branch oversight. The Administration looks forward to engaging Congress on comprehensive legislation to move forward on this important national responsibility.

In the meantime, the Administration, through the Department of Energy (DOE), is undertaking activities within existing Congressional authorization to plan for the eventual transportation, storage, and disposal of used nuclear fuel. Activities range from examining waste management system design concepts, to developing plans for consent-based siting processes, to conducting research and development on the suitability of various geologies for a repository. These activities are designed to not limit the options of either the Administration or Congress and could be transferred to the new waste management and disposal organization when it is established.

BACKGROUND

The NWPA established a broad policy framework for the permanent disposal of used nuclear fuel and high-level radioactive waste derived from nuclear power generation. The NWPA authorized the government to enter into contracts with reactor operators – the generators and current owners of used nuclear fuel – providing that, in exchange for the payment of fees, the government would assume responsibility for permanent disposal. The fees were to ensure that the reactor owners and power

generators pay the full cost of the disposal of their used nuclear fuel and high-level radioactive waste.

The federal government did not meet its contractual obligation to begin accepting used nuclear fuel by 1998. As a result of litigation by contract holders, the government was found in partial breach of contract, and is now liable for damages to some utilities to cover the costs of on-site, at-reactor storage.

Currently more than 68,000 metric tons heavy metal (MTHM) of used nuclear fuel are stored at 72 commercial power plants around the country with approximately 2,000 MTHM added to that amount every year. The sooner that legislation enables progress on implementing this Strategy, the lower the ultimate cost will be to the taxpayers. This document outlines a strategy that is intended to limit, and then end, liability costs by making it possible for the government to begin performing on its contractual obligations.

The NWPA specified a process for evaluating sites for a repository. The Administration concurs with the conclusion of the BRC that a fundamental flaw of the 1987 amendments to the NWPA was the imposition of a site for characterization, rather than directing a siting process that is, as the BRC recommends, "explicitly adaptive, staged, and consent-based…" In practical terms, this means encouraging communities to volunteer to be considered to host a nuclear waste management facility while also allowing for the waste management organization to approach communities that it believes can meet the siting requirements. Under such an arrangement, communities could volunteer to provide a consolidated interim storage facility and/or a repository in expectation of the economic activity that would result from the siting, construction, and operation of such a facility in their communities.

In addition to commercial used nuclear fuel, high-level radioactive wastes that are the by-products of the production of the nation's nuclear weapons and used fuel from the Navy's nuclear powered combat vessels also require a defined disposal path. These wastes are currently stored at sites in Idaho, South Carolina, and Washington. Also, significant quantities of weapons-capable plutonium and highly enriched uranium have become surplus to our national security needs, and in some form will be destined for disposal in a repository.

STRATEGY ELEMENTS

This Strategy provides a basis for the Administration to work with Congress to design and implement a program to meet the government's obligation to take title to and permanently dispose of used nuclear fuel and high-level radioactive waste. It also provides near-term steps to be implemented by DOE pending enactment of new legislation. The key elements of this Strategy are captured in Figure 1.

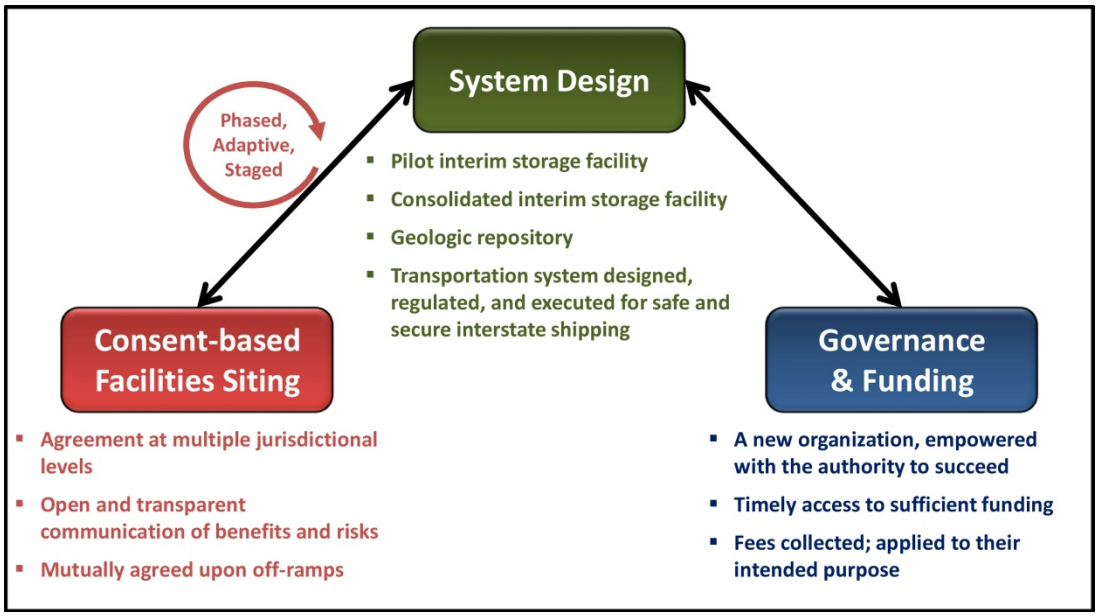

Figure 1. Key Strategy Elements

System Design

The Administration supports an approach to system design that integrates consent-based siting principles and makes progress in demonstrating the federal commitment to addressing used nuclear fuel and high-level radioactive waste disposal, including building the capability to begin executing that commitment within the next 10 years. The Administration supports a nuclear waste management system with the following elements:

- A pilot interim storage facility with limited capacity capable of accepting used nuclear fuel and high-level radioactive waste and initially focused on serving shut-down reactor sites;
- A larger, consolidated interim storage facility, potentially co-located with the pilot facility and/or with a geologic repository, that provides the needed flexibility in the waste management system and allows for important near-term progress in implementing the federal commitment; and
- A permanent geologic repository for the disposal of used nuclear fuel and high-level radioactive waste.

The objective is to implement a flexible waste management system incrementally in order to ensure safe and secure operations, gain trust among stakeholders, and adapt operations based on lessons learned. As will be addressed in the following section on implementation, the Administration agrees with the Blue Ribbon Commission that a consent-based siting process offers the promise of sustainable decisions for both storage and disposal facilities. Figure 2 below portrays a set of possible pathways to developing system facilities and capabilities.

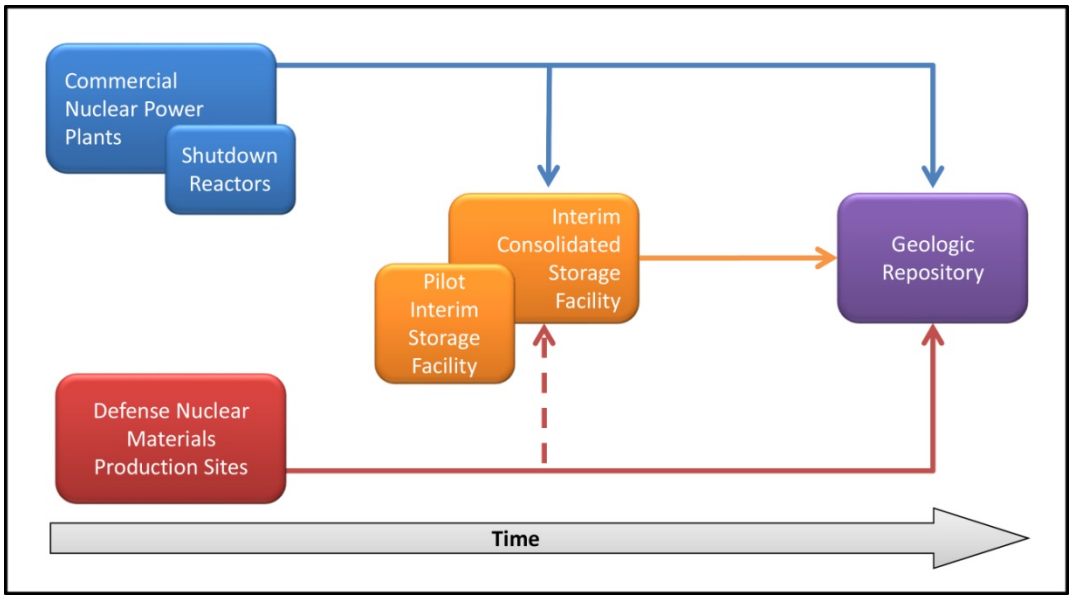

Figure 2. Possible system pathways

This system would initially be focused on acceptance of used nuclear fuel from shut-down reactors; such fuel provides an opportunity to build waste handling capability as well as to relieve surrounding communities and utility contract holders of the burdens associated with long-term storage of used nuclear fuel at a shut-down reactor. Following these initial efforts, capacity will be developed to enable the acceptance and transportation of used nuclear fuel at rates greater than that at which utilities are currently discharging it in order to gradually work off the current inventory. The Administration remains committed to addressing the Cold War legacy; and, in addition to ongoing efforts, will consider transportation and interim storage of government-owned used nuclear fuel and high-level radioactive waste at interim storage facilities.

Interim Storage

The BRC recommended that "one or more consolidated (interim) storage facilities be developed to start the orderly transfer of used nuclear fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository." The Administration agrees that interim storage should be included as a critical element in the waste management system and has several benefits, including flexibility in system planning and execution and the opportunity to move expeditiously to fulfill government contractual responsibilities.

The Administration also agrees with the BRC that a linkage between opening an interim storage facility and progress toward a repository is important so that states and communities that consent to hosting a consolidated interim storage facility do not face the prospect of a *de facto* permanent facility without consent. However, this linkage should not be such that it overly restricts forward movement on a pilot or larger storage facility that could make progress against the waste management mission. The NWPA currently constrains the development of a storage facility by limiting the start of construction of such a facility until after the Nuclear Regulatory Commission (NRC) has issued a license for construction of a

repository. This restriction has effectively eliminated the possibility of having an interim storage facility as an integral component of a waste management system.

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. 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 if enabled by appropriate legislation. The Administration would plan to undertake activities necessary to enable the commencement of operations at this facility in 2021, including conducting a consent-based siting process with interested parties, undertaking the requisite analyses associated with siting such a facility, and initiating engineering and design activities as warranted. Full execution of this plan depends on enactment of revised legislative authority.

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. In addition, a larger-scale facility could take possession of sufficient quantities of used nuclear fuel to make progress on the reduction of long-term financial liabilities. Depending on the outcome of a consent-based process, this facility could have a capacity of 20,000 MTHM or greater, and could be co-located with the pilot facility or the eventual geologic repository. In the context of the overall waste management system, the Administration supports the goal of siting, designing, licensing, constructing and commencing operations at a consolidated interim storage facility by 2025.

In addition to commercial used nuclear fuel, pilot-scale and larger interim storage facilities could provide similar benefits for government-owned and managed used nuclear fuel and high-level radioactive waste, such as demonstration of capability and flexibility in system operations. Therefore, the feasibility of accepting these wastes at interim storage facilities will be considered.

Transportation

The BRC found that existing standards and regulations for the transportation of used nuclear fuel and high-level radioactive waste administered by DOE, NRC, the U.S. Department of Transportation, and state, local, and tribal governments are proven and functioning well. Consistent with the recommendations of the BRC on this issue, the Administration is moving ahead with initial planning for engagement and technical assistance for transportation operations for state and local governments.

As described in the Ongoing Activities section of this document, the Department is proceeding with planning activities for the development of transportation capabilities and storage facilities to facilitate the acceptance of used nuclear fuel at a pilot interim storage facility within the next 10 years and later

at a larger consolidated interim storage facility. The Administration will undertake the transportation planning and acquisition activities necessary to initiate this process with the intent to transfer them to a separate organizational entity if and when it is authorized by Congress and in operation. Outreach and communication, route analysis, and emergency response planning activities consistent with existing NWPA requirements would be conducted during this time. The Administration agrees with the BRC that the relationships and processes built with other federal agencies, state agencies, and local governments to support logistics of shipments to the Waste Isolation Pilot Plant (WIPP) have been successful and the infrastructure and lessons learned from this experience will be utilized moving forward.

Geologic Disposal

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 BRC recommended that the U.S. undertake "an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geologic facilities for the safe disposal of used fuel and high-level nuclear waste." 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. The Administration's goal is to have a repository sited by 2026; the site characterized, and the repository designed and licensed by 2042; and the repository constructed and its operations started by 2048. Consistent with this effort, the Administration understands the need for the Environmental Protection Agency to develop a set of generic, non-site-specific, repository safety standards to gain public confidence that any future repository will protect public health and the environment. This will be an important early step in any repository siting effort.

The ability to retrieve used nuclear fuel and high-level radioactive waste from a geologic repository for safety purposes or future reuse has been a subject of repository design debate for many years. A recently completed technical review by Oak Ridge National Laboratory found that approximately 98 percent of the total current inventory of commercial used nuclear fuel by mass can proceed to permanent disposal without the need to ensure post-closure recovery for reuse based on consideration of the viability of economic recovery of nuclear materials, research and development (R&D) needs, time frames in which recycling might be deployed, the wide diversity of types of used nuclear fuel from past operations, and possible uses to support national security interests.[3] This assessment does not preclude any decision about future fuel cycle options, but does indicate that retrievability it is not necessary for purposes of future reuse.

[3] J. C. WAGNER et al., Categorization of Used Nuclear Fuel Inventory in Support of a Comprehensive National Nuclear Fuel Cycle Strategy, ORNL/TM-2012/308 (FCRD-FCT-2012-00232), Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2012.

Disposal of defense wastes alongside commercial wastes is the current policy in accordance with the 1985 decision to use a single repository for both commercial and defense wastes. The issue of "commingling" of wastes in a repository will be the subject of analysis moving forward.

Advanced Fuel Cycles

The BRC concluded that "it is premature at this point for the United States to commit irreversibly to any particular fuel cycle as a matter of government policy…" and pointed out that "it is… very likely that disposal will be needed to safely manage at least some portion of the existing commercial [used nuclear fuel] inventory." Even if a closed fuel cycle were to be adopted in the future, permanent geologic disposal will still be required for residual high-level radioactive waste. Cost, nonproliferation, national security, environmental concerns, and technology limitations are some of the concerns that would need to be addressed before any future decision to close the U.S. fuel cycle through the use of recycling would be made. These factors reinforce the likelihood that the once-through fuel cycle will continue at least for the next few decades. Nevertheless, consistent with past practice and the BRC's recommendations, DOE will continue to conduct research on advanced fuel cycles to inform decisions on new technologies that may contribute to meeting the nation's future energy demands while supporting non-proliferation and used nuclear fuel and high-level radioactive waste management objectives.

International Cooperation

International cooperation has been a cornerstone of both U.S. fuel cycle R&D efforts as well as actions to reduce the global proliferation of nuclear materials. Recently, several countries, led by the U.S. and others, have come together to establish frameworks within which multi-national fuel cycle facilities could enable wider access to the benefits of nuclear power while reducing proliferation risks. The BRC recommended that the U.S. develop the capability "to accept used fuel from foreign commercial reactors, in cases where the President would choose to authorize such imports for reasons of U.S. national security." The focus of the present Strategy is on a clear path for the safe and permanent disposal of U.S. used nuclear fuel and high-level radioactive waste; however, the Administration will continue to evaluate the BRC's recommendation and will discuss with Congress the pros and cons of including it in the new waste disposal program.

Implementation

Critical elements for successful implementation of this Strategy include the establishment of a consent-based siting process, a new organization to execute the waste management mission and implementation of a process for long-term, stable funding. The design of both the new organization and the funding source should strike an appropriate balance between independence of the new organization and the need for oversight by Congress and the Executive branch.

Consent-based Siting

The BRC recommends a siting process that is consent-based, transparent, phased, adaptive, standards- and science-based, and governed by legally-binding agreements between the federal government and host jurisdictions. Indeed, promising 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 than a top down approach to siting. One of the consequences of a consent-based siting process could be the need to have more than one storage facility and/or repository. Multiple communities with differing interests and strengths may propose options leading to system configurations that involve multiple facilities. However, this Strategy focuses on one pilot storage, consolidated interim storage, and repository.

The BRC offered the view that "a good gauge of consent would be the willingness of the host [jurisdictions] to enter into legally binding agreements…that can protect the interests of their citizens." Defining consent, deciding how that consent is codified, and determining whether or how it is ratified by Congress are critical first steps toward siting the storage facilities and repository discussed above. As such, they are among the near-term activities to be undertaken by the Administration in consultation with Congress and others. Legislation recently under consideration by Congress includes requirements for consent at multiple levels, including Congressional ratification. The Department is currently gathering information from the siting of nuclear facilities in the U.S. and elsewhere in order to better understand critical success factors in these efforts and to facilitate the development of a future siting process for a repository and storage facilities.

This Strategy endorses the proposition that prospective host jurisdictions must be recognized as partners. Public trust and confidence is a prerequisite to the success of the overall effort, as is a program that remains stable over many decades; therefore, public perceptions must be addressed regarding the program's ability to transport, store, and dispose of used nuclear fuel and high-level radioactive waste in a manner that is protective of the public's health, safety, and security and protective of the environment.

Management and Disposal Organization

A new waste management and disposal organization (MDO) is needed to provide the stability, focus, and credibility to build public trust and confidence. Managing waste and used fuel is a governmental responsibility and there are multiple possible structures for this new organization. The MDO would be charged with the management and disposal of commercial used nuclear fuel and the associated interface with the utilities. The government will continue to manage its own high-level radioactive waste and used nuclear fuel until it is transferred to an MDO for storage and/or disposal. The BRC recommended the establishment of new, single-purpose organization "to provide the stability, focus, and credibility that are essential to get the waste program back on track." The BRC recommended a specific model in a congressionally-chartered federal corporation. The Administration agrees that a new organizational entity is needed and believes that there are several viable organizational models that can

possess the critical attributes described below.

As part of the development of this Strategy, the Department of Energy commissioned work by the RAND Corporation to examine organizational alternatives for addressing used nuclear fuel and high-level radioactive wastes.[4] RAND assessed lessons learned from the history of the previous DOE organization and analyzed alternative organizational models currently in use both in and out of government. The study's authors concluded that a federal government corporation and an independent government agency are two promising models for a new organization to manage and dispose of used nuclear fuel and high-level radioactive waste, as both models can achieve the critical attributes of accountability, transparent decision-making, autonomy, a public interest mission, and organizational stability. The study also examined the attributes of federally-chartered private corporations and determined that this model is not a good option because obligations to stockholders and the profit motive could result in weakened public accountability and poor political credibility. The RAND study noted that "The success of any future MDO will be driven by many factors and unforeseen circumstances. The organizational form is only one of these factors and perhaps not even the most important one." Rather, of key importance is the flexibility the U.S. government has in crafting a new organization and the specific characteristics with which that organization is endowed.

Whatever form the new organization takes, organizational stability, leadership continuity, oversight and accountability, and public credibility are critical attributes for future success. The Administration will work with Congress to ensure that the MDO authorization provides adequate authority and leadership to execute its mission, with appropriate oversight and controls. Pending enactment of new legislation to establish the MDO, DOE's existing offices retain responsibility to maintain progress in implementing this Strategy. Once the MDO is established, the Administration will carefully evaluate the appropriate activities to be transferred. DOE will take necessary steps to advance the program while taking every precaution to avoid compromising the later ability of the newly established MDO to succeed.

In addition, the mission of the MDO will need to be carefully defined. For example, funding made available to the MDO should be used only for the management and disposal of radioactive waste. While this could include the management and disposal of waste resulting from the processing of defense materials, the MDO itself should not be authorized to perform research on, fund or conduct activities to reprocess or recycle used nuclear fuel. These limitations on the MDO mission are consistent with the recommendations of the BRC.

Funding

With regard to funding, the BRC noted that "…the success of a revitalized nuclear waste management program will depend on making the revenues generated by the nuclear waste fee and the balance in the

[4] *Choosing a New Organization for Management and Disposition of Commercial and Defense High-Level Radioactive Materials*, RAND Corporation, Washington, DC, MG-1230-DOE, 2012. The report is available free for downloading at www.rand.org/pubs/monographs/MG1230.html.

NWF available when needed and in the amounts needed to implement the program." The Administration agrees that providing adequate and timely funding is critical to the success of the nuclear waste mission.

The NWPA established a self-financing mechanism for the nation's commercial nuclear material management system. Congress intended at the time to ensure a stable, ongoing source of funding for the program and also one that would not burden taxpayers. Under the NWPA, the government currently assesses utilities a fee equal to one mill ($0.001) for each kilowatt-hour of electricity sold from nuclear power plants in exchange for agreeing to accept and permanently dispose of utilities' used nuclear fuel. Fees collected total approximately $750 million per year. This fee income is credited to the Nuclear Waste Fund (NWF, or the "Fund"), a fund held in the U.S. Treasury in which monies in excess of appropriations are invested in non-marketable Treasury securities, and the interest earnings are credited to the Fund. The current balance of the Fund is estimated at $28 billion.

Subsequent to passage of the NWPA, a series of broader budgeting acts passed by Congress have had the effect of disconnecting the revenues from the expenditures necessary for a waste disposal solution. All NWF spending is subject to annual appropriations and is required to compete with other priorities within budget caps imposed on all government discretionary spending, while continued collection of the full amount of fees is credited on the mandatory side of the budget as offsetting receipts. As a result, even though the intent of the NWPA was to make the balances of the NWF available when needed to cover the government's cost to dispose of the used nuclear fuel, there is a disconnect that makes access to funding difficult.

Moving forward, the key challenge is to ensure that past and future fee receipts and accrued interest are made available to meet mission requirements in a timely and dependable manner. To achieve this goal, reform of the current funding arrangement is necessary and should consist of the following elements: ongoing discretionary appropriations, access to annual fee collections provided in legislation either through their reclassification from mandatory to discretionary or as a direct mandatory appropriation of the fees, and eventual access to the balance or "corpus" of the NWF.

First, future funding arrangements should include a role for the Appropriations Committees of Congress through ongoing discretionary appropriations, funded within the discretionary spending limits. Ongoing engagement with the Appropriations committees ensures annual oversight and increases the likelihood of a sustained Congressional commitment to the nuclear waste mission. Annual appropriations could be used to fund expenses that are regular and recurring, such as program management costs, including administrative expenses, salaries and benefits, and studies.

Second, access to annual fee collections could support activities such as the development of interim storage facilities, establishment of the transportation system, siting and characterization of a geologic repository, and execution of regulatory development and oversight. This access could be accomplished either through legislative reclassification of fee collections from mandatory to discretionary, or as a direct mandatory appropriation of the fees, or some combination thereof. Legislative reclassification of fee collections from mandatory to discretionary would allow the fees to offset NWF discretionary

appropriations, so that appropriation of the fees no longer would have to compete with other discretionary priorities. Instead, fees would be provided in amounts needed only above the annual appropriations described above and would also be limited by the amount of fee income, as envisioned by the NWPA. This approach could be preferable if additional Appropriator involvement was desired or deemed necessary and regular annual appropriations of that magnitude could be identified.

Alternatively, a direct mandatory appropriation of the annual fees could be coupled with direct access to the corpus of the NWF, as further discussed below. Under this arrangement, spending could be controlled through annual mandatory spending caps set by Congress or by tying funding levels to specific system development milestones in legislation. With continued oversight by the Appropriations Committees, these mandatory spending caps could be adjusted, as deemed necessary and appropriate. Implementation of either or a combination of both of these approaches will require substantial consultation with Authorizing, Budget, and Appropriations Committees of Congress; the Administration is committed to working with Congress to find a mutually agreeable solution to this issue.

Third, regardless of how access to the annual fees is provided, the substantial corpus of the NWF will be needed at an appropriate time in the future, particularly to support the development of a geologic repository. The cost of constructing repository facilities could outstrip the annual fee collections and other discretionary appropriations discussed above. Direct access to the corpus of the NWF through mandatory appropriations could be carefully managed by limiting its use to specific capital expenditures, tied to performance triggers, such as meeting licensing actions and major construction milestones, or subject to hard spending caps.

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 DOE, 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 the budget does not reflect full estimates of the future cost of these liabilities and does not fully reflect the potential future cost of continued insufficient action. Future budget projections would be improved by including the full cost of estimated liability payments in the baselines constructed by both CBO and OMB. If the full cost of the estimated liability payments is accurately reflected in the baseline program costs over the life of the project would eventually be offset by reductions in liabilities as the government begins to pick up sufficient waste from commercial sites. As a result, the projected long-term cost of insufficient action surpasses the cost of implementing the program in the short run.

Any new funding structure for this program will need to balance increased funding flexibility and rigorous spending oversight to help assure that the program is implemented in the most cost-effective manner possible, while still holding the MDO accountable to the President and Congress. Further, crafting the MDO funding structure will require a creative and nuanced approach to providing needed funds with involvement by the Administration and all of the appropriate committees of Congress, working together to achieve a viable solution within the current federal budget rules and procedures.

The President's fiscal year 2014 budget will include additional details regarding funding for the program of work described in this Strategy document.

ONGOING ACTIVITIES

Within DOE, the Office of Nuclear Energy's Office of Fuel Cycle Technology has initiated a planning project with the objective of pursuing activities that can be conducted within the constraints of the NWPA and will facilitate the development of an interim storage facility, of a geologic repository, and of the supporting transportation infrastructure. The activities being conducted can be transferred to a new MDO when established and will not constrain its options. This includes initiating planning for a large-scale transportation program; evaluating operational options for consolidated storage and furthering the design of a generic consolidated storage facility. The Department is also developing plans for initiating a consent-based siting process. The Department will continue with these activities and those listed below, within existing Congressional authorization, while the Administration and Congress work together on potential changes to the nuclear waste management program.

The BRC also urged the Department to evaluate options for transportation of used nuclear fuel from shut down reactors. In 2013, DOE is evaluating the inventory, transportation interface, and shipping status of used nuclear fuel at shut-down reactor sites. The Department has established cooperative agreements with state and regional groups and engaged tribal representatives to begin discussions on transportation planning and emergency response training consistent with NWPA Section 180(c). Further, the Department is considering how best to leverage the work of state and regional groups currently engaged in transportation planning and oversight of radioactive waste shipments to WIPP in New Mexico.

In FY 2013, the Department is undertaking disposal-related research and development work in the following areas: an evaluation of whether direct disposal of existing storage containers used at utility sites can be accomplished in various geologic media; an evaluation of various types and design features of back-filled engineered barriers systems and materials; evaluating geologic media for their impacts on waste isolation; evaluating thermal management options for various geologic media; establishing cooperative agreements with international programs; and developing a research and development plan for deep borehole disposal, consistent with BRC recommendations.

CONCLUSION

In this Strategy, the Administration has highlighted agreement with many of the principles of the BRC recommendations and has outlined actions that, with legislative authorization by Congress, can lead to a safe and responsible solution to managing the nation's nuclear waste. Indeed, action by Congress in the form of new authorizing legislation and appropriations is necessary for success of the waste management mission. Specifically, legislation is needed in the near term to permit or address the following activities over the next 10 years:

- Active engagement in a broad, national, consent-based process to site pilot and full-scale interim storage facilities, and site and characterize a geologic repository;
- Siting, design, licensing, and commencement of operations at a pilot-scale storage facility with an initial focus on accepting used nuclear fuel from shut-down reactor sites.;
- Significant progress on siting and licensing of a larger consolidated interim storage facility capable of providing system flexibility and an opportunity for more substantial progress in reducing government liabilities;
- Development of transportation capabilities (personnel, processes, equipment) to begin movement of fuel from shut-down reactors;
- Reformation of the funding approach in ways that preserve the necessary role for ongoing discretionary appropriations and also provide additional funds as necessary, whether from reclassified fees or from mandatory appropriation from the NWF or both; and
- Establishment of a new organization to run the program, the structure and positioning of which balance greater autonomy with the need for continued Executive and Legislative branch oversight.

This Strategy translates the BRC's report and recommendations into a set of broad steps that will ultimately benefit the entire nation. The Administration will work closely with Congress to develop a path forward that maximizes the likelihood of success. When executed, the new program will provide near-term and long-term solutions for managing the back-end of the nuclear fuel cycle, thereby resolving a longtime source of conflict in nuclear policy by providing safe, secure, and permanent disposal. Until the necessary new legislation has been enacted, the Administration will pursue components of the Strategy as described above pursuant to current law and in close coordination with Congress. Finally, in executing the program the federal government must work closely with potential host states, tribes, and communities whose engagement will be essential for successfully operating a comprehensive used nuclear fuel and high-level radioactive waste storage, transportation, and disposal system.