American Nuclear Society

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October 9, 2025

The Honorable Chris Wright
Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Secretary Wright:

On May 23, 2025, the Trump Administration issued four executive orders with the goal of advancing nuclear energy to help meet America's growing demand for reliable, affordable, secure, and clean energy. Executive Order 14302 addressed reinvigorating the nuclear industrial base, and Section 3 of that order, Strengthening the Domestic Nuclear Fuel Cycle, called for you, within 240 days and in coordination with the Secretary of Defense, the Secretary of Transportation, and the Director of the Office of Management and Budget (OMB), to prepare and submit to the President, through the Chair of the National Energy Dominance Council and the Director of the Office of Science and Technology Policy, a report addressing numerous important nuclear fuel cycle issues. We are pleased to provide you with a focused set of recommendations from the American Nuclear Society (ANS) related to the back end of the nuclear fuel cycle, which will hopefully prove useful to the Department of Energy in developing the *240 Day Report*.

Over more than five decades, the U.S. commercial nuclear industry has established a sterling record in the safe, efficient storage and transportation of used nuclear fuel. Nevertheless, the U.S. has no stable, coherent nuclear fuel cycle policy and has made little progress on the back end of the fuel cycle for the past 15 years. The federal government's protracted failure to fulfill its statutory and contractual obligations in this area stands in sharp contrast to other nations that are moving forward while the U.S. stands still. ANS applauds the Administration for addressing issues that have been neglected for too long.

ANS Position Statement #3, *Management of the Nation's Used Nuclear Fuel and High-Level Waste*,[1] documents 11 essential elements of a comprehensive approach to the back end of the fuel cycle. These recommendations are generally consistent with other stakeholder organizations that have, like ANS, been engaged on these issues for decades. This letter does not attempt to replicate Position Statement #3 or even attempt to address every aspect of the *240 Day Report*; instead, it highlights some key points that relate to the Executive Order and the goal of establishing an effective domestic program for management of the back end. These recommendations are informed by the experience and insights of ANS members who are scientists, engineers, executives, and communicators with expertise in used nuclear fuel management, reprocessing and reuse of nuclear materials, and waste disposal.

ANS appreciates that your Administration recognizes the value of nuclear technology in supporting U.S. energy and national security goals. We hope these recommendations are useful to you and your department as you identify and implement programs that will shape the nuclear enterprise for decades to

[1] Position Statement #3, *Management of the Nation's Used Nuclear Fuel and High-Level Waste*, American Nuclear Society, June 2023.

come. We encourage you to reach out to us if you have any questions or if you would like to discuss these matters further.

Sincerely,

Dr. Hash Hashemian
President, ANS

Mr. Craig Piercy
Executive Director and CEO, ANS

Attachment: American Nuclear Society Recommendations on Strengthening the Nuclear Fuel Cycle

cc: Theodore Garrish, Assistant Secretary for Nuclear Energy, U.S. Department of Energy

Paul Murray, Deputy Assistant Secretary for Spent Fuel and High-Level Waste Disposition, U.S. Department of Energy

Attachment

American Nuclear Society Recommendations on Strengthening the Nuclear Fuel Cycle
October 9, 2025

These ANS recommendations pertain to back end of the nuclear fuel cycle considerations in Executive Order 14302, Reinvigorating the Nuclear Industrial Base. These recommendations are focused on areas that are entirely or mostly within the purview of the Executive Branch. ANS breaks its recommendations into two broad categories: (i) general programmatic recommendations and (ii) specific aspects of an integrated nuclear fuel cycle back end program.

General Recommendations on Program Management and Policy

G1. **Reestablish the Office of Civilian Radioactive Waste Management (OCRWM) to carry out federal government obligations related to spent nuclear fuel (SNF) and high-level radioactive waste (HLW).** Although OCRWM is required by statute (the Nuclear Waste Policy Act of 1982, as amended), a decade and a half ago a previous administration eliminated the office and dispersed its authorities to various organizations within the Department of Energy (DOE). Most of the technical and managerial responsibilities reside within the Office of Nuclear Energy (NE). This arrangement has proven to be an unnecessary distraction for NE management, and it does not provide spent fuel management with the necessary focus and priority within DOE. ANS recommends that DOE reestablish a dedicated office to handle the government's obligations. In the longer term, ANS and virtually all other stakeholders support moving the program out of DOE altogether, but that will require legislative action. In the meantime, reestablishing a dedicated office within DOE will demonstrate that this Administration takes its responsibilities seriously, and it will be a first step toward a more optimal approach.

G2. **Emphasize innovation and demonstration.** Technology has not stood still since the Nuclear Waste Policy Act was passed more than 40 years ago. The federal government should be open to new ideas and approaches to meeting the challenges and should be taking advantage of the opportunities associated with the back end of the nuclear fuel cycle. In addition, the federal government has done enough paper studies; it sorely needs real progress in carrying out its obligations to nuclear power plant operators and the American people. It has been more than 27 years since the federal government was supposed to begin removing SNF from nuclear power reactor sites. ANS recommends the government explore demonstration projects on a small, achievable scale to identify approaches that offer practical, cost-effective solutions for nuclear materials management in the U.S.

G3. **Build a sustainable program.** Almost as soon as the Nuclear Waste Policy Act was signed, political considerations began undermining the national nuclear waste policy. Political considerations will always be with us, but there is an emerging national consensus that nuclear energy will be an important part of our clean and secure energy future. This development offers an opportunity to forge solutions that transcend partisan and geographical divides. Nuclear materials management is a long game, and top-down approaches without broad support are unlikely to survive multiple administrations. In this arena, moving deliberately but steadily leads to success, while perceived shortcuts can be counterproductive.

G4. **Acknowledge and address nonproliferation considerations with appropriate rigor.** Concerns about nuclear proliferation have had a major impact on U.S. nuclear policy. In the 1970s, the federal government upended the planned U.S. nuclear fuel cycle in reaction to India's 1974 nuclear explosion. Since then, it has been demonstrated that commercial nuclear fuel cycle technology and materials can be successfully safeguarded, and that fuel cycle approaches involving separated fissile material do not automatically lead to weapons proliferation.[2] However, we also know those technologies and materials do not take care of themselves. Continued U.S. engagement and leadership supporting the International Atomic Energy Agency and enforcing the Nuclear Nonproliferation Treaty are essential. Building a sustainable back end program with innovative approaches includes the obligation to ensure that those approaches are carried out with appropriate safeguards and security provisions.

G5. Develop and pursue legislative recommendations. The United States has a nuclear waste policy, as embodied in the Nuclear Waste Policy Act of 1982, as amended. However, the federal government abandoned the policy in 2010. Since that time, no administration has proposed legislation to put a revised nuclear waste policy in place. As ANS pointed out in 2019,[3] there is much that can be done productively through executive action without additional Congressional authorization, and that is the focus of these ANS recommendations. However, a sustainable and enduring nuclear materials management program requires a firm legal underpinning. Legislating on nuclear waste is difficult and frustrating—but necessary. Congressional action is much needed, and ANS encourages this Administration to follow through with realistic legislative proposals and effective engagement with Congress. Ultimately, we must put an up-to-date nuclear waste policy in place. ANS endorses subsection (a)(ii) of Section 3 of Executive Order 14302, which calls for the *240 Day Report* to identify legislative changes needed to implement an effective national policy.

Specific Recommendations on Aspects of an Integrated Nuclear Fuel Cycle Back End Program

S1. **Establish a credible project to identify and develop one or more geologic repositories for nuclear waste.** A repository is the linchpin of any viable nuclear power back end program, yet the U.S. has had no repository program for the past 15 years. Every remotely practical nuclear fuel cycle, including those that recycle spent fuel, produces extremely long-lived radionuclides that have no practical uses and must be isolated from the environment for time scales on the order of a million years. Other nations, including Finland, Sweden, Switzerland, France, Canada, Russia, and China, are making progress in this area, while the United States stands still. The U.S. stalemate developed due to opposition by some parties to the proposed Yucca Mountain repository, but the stalemate does not have to persist. ANS recommends that DOE revise and reissue its 2008 report DOE/RW-0595[4] on the need for a second repository. That well-reasoned DOE report considered multiple alternatives and recommended that Congress remove the administrative limit of 70,000 metric tons[5] on the first repository, because at that point in time Yucca Mountain licensing was proceeding apace and the site had the technical capacity to accept much more material. However, the situation is quite different in 2025.

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[2] See Position Statement #55, *Nonproliferation*, American Nuclear Society, November 2023.
[3] Issue Brief: A Proposal for Progress on Nuclear Waste Management, American Nuclear Society, 2019.
[4] DOE/RW-0595, "The Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository," Department of Energy, December 2008.
[5] While the limit is administrative and has no technical basis, it is specified in the Nuclear Waste Policy Act.

The Yucca Mountain Repository Project is effectively off the table, and it is clear the U.S. needs another repository option. Consistent with current law, the Administration should point this reality out to Congress by revising and reissuing DOE/RW-0595. This will encourage Congress to work with the Administration and stakeholders to take responsible action on geologic disposal of radioactive waste in the U.S.

In parallel, consistent with the Nuclear Waste Policy Act, the Administration should promptly promulgate new generic standards for the protection of public health and the environment from radionuclide releases from a geologic repository. The current standards, codified in 40 CFR Part 191,[6] are out-of-date, inconsistent with best practices, and impractical for evaluation of the safety of potential repository sites in a health-based, transparent manner. The 2023 report of the ANS Special Committee on Generic Standards for Disposal of High-Level Radioactive Waste[7] describes this issue in detail and provides recommendations on appropriate standards that, if implemented, would facilitate the Environmental Protection Agency rulemaking process.

S2. **Pursue consolidated storage of commercial SNF.** Consolidated storage brings a number of advantages to a functioning, integrated spent fuel management program. It would enable the government to begin carrying out its obligation to remove spent fuel from nuclear power plant sites and thereby mitigate somewhat the financial damages being paid by the government each year. It would allow clearance of fuel from permanently shut-down reactor sites, permitting beneficial reuse of the land. It would serve as a "buffer facility" for other elements of an integrated spent fuel management system, such as a disposal facility or a recycling facility. It would develop and exercise the infrastructure for spent fuel transportation. Public opinion surveys indicate that waste management concerns are the most prominent "negative" for expanded use of nuclear energy, so demonstrating progress in spent fuel management should bolster public acceptance of new nuclear power plants.

S3. **Explore recycling of SNF through well-structured demonstration programs.** Recycling starts with reprocessing, or separating spent fuel into constituent parts: typically uranium, plutonium, fission products and actinides, and fuel assembly structural metal. In today's light water reactor (LWR) spent fuel, plutonium is roughly 1% of the spent fuel heavy metal mass, and the plutonium can be reused as reactor fuel after reprocessing and fuel fabrication. Uranium (roughly 96% of LWR spent fuel) is typically stored today after being recovered from spent fuel, but it can be re-enriched to use as new reactor fuel.[8] Recycled uranium could also be converted to plutonium in breeder reactors and used as reactor fuel, if there were any breeder reactors, separation facilities, and plutonium fuel fabrication facilities available for that purpose in the United States. In today's reprocessing plants, the remaining material in spent fuel—fission products, actinides, and structure metal—is treated as waste for disposal in a geologic repository.
Several important facts about recycling nuclear fuel are highlighted below.

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[6] *Code of Federal Regulations*, Title 40, "Protection of Environment," Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes;" https://www.ecfr.gov/current/title-40/chapter-I/subchapter-F/part-191.

[7] Kessler, J., et al., "Recommendations on Postclosure Aspects of Generic Standards for the Permanent Disposal of Spent Nuclear Fuel and High-Level and Transuranic Radioactive Wastes in the United States," American Nuclear Society, August 2023.

[8] In this mode, the recycled uranium is basically substituted for natural uranium that would otherwise have to be mined from the ground. However, the recycled uranium contains higher percentages of undesirable uranium isotopes, so it must be segregated from natural uranium and enriched to a higher level.

- Only a small fraction of recycled material is directly reusable as nuclear fuel.
- Because of the radiotoxicity of plutonium, fabricating that material into fuel is more difficult and expensive than fabricating fuel from uranium.
- Even if all nuclear fuel is recycled, there are still significant amounts of highly radioactive material that must be disposed of as waste. In other words, recycling does not obviate the need for a geologic repository for radioactive waste disposal.[9]

Even with a well-run recycling system, it is more expensive today to recycle spent fuel into LWRs than to source new fuel from natural uranium. As low-cost sources of natural uranium are used up, and as the cost of geologic disposal becomes better known, the economics will likely change, and at some point, recycling may become desirable from a cost perspective. ANS believes recycling will be an important factor in the long-term sustainability of energy from nuclear fission.

In addition to serving as a source of fissile and fertile material and, potentially, valuable radionuclides, recycling has implications with respect to waste management. It changes the form and amount of the material that must be disposed of, but, as noted earlier, it does not obviate the need for a repository. Given the overall uncertainties and variabilities associated with repositories, impacts of recycling on repository cost and space requirements are speculative and would vary with geologic media, spent fuel aging time, and other factors.

A leap into spent fuel recycling should not be taken lightly. Successful recycling requires effective integration with the entire nuclear fuel cycle—not only back end elements of interim storage, transportation, and disposal, but front end elements of enrichment and fuel fabrication. Most importantly, nuclear power reactors must be compatible with fuel forms produced using fissile material from reprocessing, and willing to use them. Bringing all these elements together in a workable manner has proven feasible in France, where the national government is the majority owner of major nuclear companies and directs the national fuel cycle policy. It will not prove to be simple or easy in a country like the U.S. where nuclear companies are privately owned and act in the interests of their shareholders.

The Executive Order requires an evaluation of the reprocessing and recycling of SNF, and DOE has extensive experience in this area. DOE operated aqueous reprocessing facilities for the weapons program, and it continues to operate H Canyon at the Savannah River Site for materials management. The department has done research and development on other reprocessing technologies, most notably pyroprocessing, and it has performed and updated comprehensive nuclear fuel cycle studies. In recent years, interest in reprocessing and recycling has risen among private companies in the U.S., based in part on the expectation that new, innovative technologies will lead to cost-effective applications. In addition, recycled fissile material appears to be well-suited for fuel for some advanced reactor designs that are under development. Well-designed public-private recycling demonstration projects would help reduce technical and cost uncertainties associated with new recycling technologies and potentially validate the much larger investments that would be needed to engage in nuclear fuel recycling on an industrial scale. However, recycling is not an end unto itself; such projects should be required to substantiate a credible business case for the technologies involved.

[9] That is why France, which reprocesses 100% of its commercial nuclear fuel, is developing a repository for nuclear waste disposal.