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How an Amended DOE Contract for Nuclear Waste Will Affect New Reactors: Considerations for Policymakers

By **Dr. Matt Bowen** and **Rama T. Ponangi**

- The federal government is contractually obligated to retrieve and dispose of spent nuclear fuel (SNF) from commercial reactors.
- But an amended standard contract for SNF from new reactors does not require the US government to remove and take title to the waste for potentially multiple generations, and if the government fails to perform its duties at that distant point, its liability may be reduced or eliminated.
- As a result, utilities operating under the amended standard contract versus the original one possess materially different rights to assert claims against the federal government.
- This arrangement—at a time when there is bipartisan support for building many new reactors to meet growing electricity demand—might also raise concerns with Congress and the public about passing the responsibility for dealing with SNF from new reactors to future generations.
- If the standard contract is not further amended to address these concerns, Congress could at least hold hearings to give the public an opportunity to comment on the revised contract and discuss the intergenerational issues at stake with SNF management.

Concerns about greenhouse gas emissions, air pollution, and energy security are driving increased interest in nuclear power, as is the recent advent of growing demand from data center companies that have made climate commitments.[1] In May 2025, the Trump administration set a goal for

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the United States to achieve 400 gigawatts (GW) of nuclear power in total, while the Biden administration had previously set a goal of 300 GW.[2] But the nearly 100 GW of current nuclear capacity has to date produced almost 100,000 metric tons (MT) of spent nuclear fuel (SNF) that remains onsite at commercial utilities. Another 40,000 MT of SNF is expected to be produced before existing reactors' current operating licenses are over.[3]

The federal government's obligation to retrieve and dispose of this waste, as described in this commentary, has not only been unfulfilled it has been weakened by changes to the original contractual relationship with reactor owners. When various new reactor projects were in development in the 2000s, DOE amended the contract for any new nuclear power plants' SNF, essentially delaying the date of retrieval and limiting DOE's liability should it not act. And DOE did so without publishing the text in the Federal Register, and, seemingly, without ever explaining the rationale behind the changes. Given the federal government continues to fail to make progress on SNF management, and the amended standard contract language provides almost nothing in the way of incentives for DOE to take action, an eminently foreseeable outcome is that SNF from new reactors is more or less left in place for future generations to deal with.

Congress can play a role in addressing this situation by pressuring the executive branch to alter the amended standard contract language to require more imminent action and to remove some of the new liability provisions (including limits tied to congressional action or inaction). If it chooses not to take such a direct tack, Congress could at least hold hearings to shine a light on the issue and give the public a chance to comment on the amended standard contract language—an opportunity the public had with the original contract but not the amended one. This would also provide a venue for discussing the intergenerational issues at stake with SNF management.

SNF Management Issues under Original Standard Contract

Under the Nuclear Waste Policy Act of 1982, the federal government is responsible for the disposal of the SNF produced by commercial reactors. When DOE published the original standard contract in 1983,[4] the expectation was that the federal government would begin SNF disposal operations in 1998, and the contract said that DOE services would begin no later than that year.[5] The utilities, in turn, were required to pay fees into the Nuclear Waste Fund (NWF)—under a "polluter pays" principle whereby utilities (and their ratepayers) would pay for the costs of disposing of the SNF[6]—and safely store the waste at their sites until DOE acceptance.

The federal government did not have a disposal facility ready in 1998, however, and has still not taken possession of the SNF pursuant to its obligations under the contract.[7] Instead, SNF is stored at

reactor facilities under interim storage arrangements, meaning the federal government has been in breach of its contracts. In 2024, DOE's projected future financial liability for these broken contracts was between $37.6 billion and $44.5 billion.[8] Citing the absence of a federal disposal program, industry stakeholders—including utilities and public utility commissions—filed a lawsuit in 2011, after which US courts ordered DOE not to continue collecting the waste fee. DOE suspended fee collection in 2014, and the NWF had a balance of $52.2 billion in September 2024.[9]

Key Changes in Amended Standard Contract

DOE started using the amended version of the standard contract about 17 years ago. The text of the revised contract[10] includes many changes to the original, but two in particular are highlighted and discussed below: 1. the significantly delayed date when DOE is obligated to take the SNF, and 2. the limits to federal liability if DOE fails to take the SNF.

With respect to the first change, the amended standard contract says that DOE is to complete acceptance of all SNF generated by a new nuclear power reactor not later than 10 years after the expiration of the original operating license or the term of any license extension granted by the Nuclear Regulatory Commission, whichever is later, and absent unavoidable delays or utility-caused delays.[11] Because commercial power reactors in the US get operating licenses for 40 years and have usually applied for and gotten extensions of those operating licenses for another 20 years, this would mean the government would not be required to accept any SNF until 70 years after a typical new reactor begins operations. This is consistent with DOE testimony to Congress in 2010 that for a reactor that became operational in 2020, "any liability resulting from the obligation to accept used fuel from that reactor most likely would not come into effect until the end of this century."[12] In the meantime, SNF would remain onsite at new reactor sites around the country.

With respect to the second change, new clauses in the amended contract appear to substantially limit the federal government's liability if it fails to accept SNF at these distant dates. For example, a new phrase appears in Article IX.A ("Unavoidable Delays by Purchaser or DOE") that says the government will not be liable for damages caused by failure in performing its duties if that failure arises out of causes beyond the reasonable control of DOE. Among those causes are "acts or inaction of Congress that, outside the control of DOE or Purchaser, affect DOE's ability to accept or the Purchaser's ability to deliver, SNF in a timely manner…"[13] This could seemingly eliminate the federal government's liability if Congress does not, for example, authorize and fully fund a program that ensures removal of the SNF by the required date.

In addition to these highlighted changes, new language in Article IX.C limits the financial damages

for DOE's failure to accept all SNF by the designated date to $5 million per year (in January 1, 2008, dollars adjusted for inflation).

All told, there is not much incentive for DOE to do anything in the near term with respect to SNF from any new reactors. (Or, from a different perspective, there is not much in the way of punishment in the event DOE fails to act in coming decades.) Requirements for DOE to accept SNF generated by new reactors—and potential consequences from a failure to do so—will not come due for perhaps 70 years or longer, pushing well into future generations. Given past inaction on the part of Congress with respect to the US SNF management program, it is not hard to envision continuing inaction from the legislative branch, but now under the amended contract DOE would be shielded from liability in the event of its nonperformance.

Conclusions and Recommendations for Policymakers

DOE's changes to the standard contract language are understandable from the point of view of trying to mitigate additional federal liability from SNF produced by any new reactors. The amended language seems likely to successfully prevent any liability in the near term and even limit long-term liability. On the other hand, the new text provides little to no assurance to utilities, states, and local communities that the federal government is ever going to follow through on taking the SNF from new reactors—even at the very distant deadlines defined in the amended standard contract. And such assurances may play a role in enabling new nuclear plant builds that both the current and previous administrations have called for.

One possible action to bolster state, local, and utility assurances of federal government responsibility for nuclear waste management would be DOE further amending the standard contract language to require action more imminently on SNF retrieval and to remove the liability dependence on congressional action. However, the Department of Justice may be opposed to increasing the potential liability of the federal government, given the hundreds of millions of dollars that are currently paid out every year for the broken contracts that were signed in the 1980s.

Congress could at least hold a hearing to give the public a chance to comment on the amended standard contract language—an opportunity the public had with the original standard contract but not the amended one. DOE does not seem to have ever explained the reasoning behind these changes, so this would be an opportunity for the agency to provide pertinent explanations. This would also provide a venue for discussion of the intergenerational ethical issues[14] at stake with delaying progress in SNF management.

The amended standard contract is certainly not the only way the federal government could provide some assurance to states and local communities about its SNF responsibility. Congress and

the executive branch could enact alternative policy solutions, such as creating new Environmental Protection Agency safety standards that will apply to future SNF disposal facilities and creating a new single-purpose organization with immediate access to utility fees to implement the US SNF management program.[15] But Congress would need to follow through on these recommendations: hold hearings; introduce draft legislation; and work toward a durable, bipartisan solution.

Bipartisan consensus on supporting advanced reactor development has existed in Congress for roughly the past eight years,[16] and the same members of Congress who have been active in this arena could serve as a starting point for a coalition focused on revamping the US SNF management program. Inaction seems a bit contradictory if the government is pushing for new reactor deployment while offering potential reactor owners a worse deal when it comes to the SNF such reactors will produce.

About the Authors

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Dr. Bowen has written reports on federal and state policies to encourage advanced reactor development, and has also published papers on reforming U.S. nuclear export controls. During the Obama Administration, he was an Associate Deputy Assistant Secretary in the Office of Nuclear Energy and a Senior Advisor in the Office of Nonproliferation and Arms Control at the U.S. Department of Energy (DOE). Previous to working at DOE, he was an AAAS/APS Science Fellow for Senate Majority Leader Harry Reid.

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Rama has completed his Bachelors in Law – B.A.,LL.B. (Specializing in Energy Laws) from University of Petroleum & Energy Studies, Dehradun, India. He has completed a diploma in International Nuclear Law from the International School of Nuclear Law (ISNL), University of Montpelier, France organized by Nuclear Energy Agency, OECD. Rama has completed his Masters in Law – LL.M. in Energy and Environmental Laws from The George Washington University Law School as GW Merit Scholar and Randolph C. Shaw Environmental Graduate Environmental Fellow. Rama has completed several other niche certifications in nuclear energy and law.

Notes

1. International Energy Agency, "The Path to a New Era for Nuclear Energy," January 16, 2025. https://www.iea.org/reports/the-path-to-a-new-era-for-nuclear-energy

2. DOE, "9 Key Takeaways from President Trump's Executive Orders on Nuclear Energy," June 10, 2025, https://www.energy.gov/ne/articles/9-key-takeaways-president-trumps-executive-orders-nuclear-energy; Brian Martucci, "Biden administration sets plan to triple US nuclear energy capacity by 2050," Utility Dive, November 13, 2024, https://www.utilitydive.com/news/biden-administration-plan-to-triple-us-nuclear-energy-capacity-by-2050/732807/.

3. At the end of 2022, the US commercial SNF inventory was over 90,000 metric tons and increasing at over 2,200 metric tons per year. DOE, "Spent Nuclear Fuel and Reprocessing Waste Inventory," December 2024, p. 3, https://curie.pnnl.gov/system/files/SNF%20and%20Rep%20Waste%20Inventory%20PNNL%2033938%20Rev.%201.1_0.pdf; US Nuclear Waste Technical Review Board, *Evaluation of the US Department of Energy Research and Development Activities on the Disposition of Commercial Spent Nuclear Fuel in Dual-Purpose Canisters*, February 2024, p. 1, https://www.nwtrb.gov/docs/default-source/reports/nwtrb_feb2024_report_evaluation_csnf_dpcs.pdf.

4. Final 10 CFR 961 rule, along with reference to the proposed rule and response to public comments, available at https://www.govinfo.gov/content/pkg/FR-1983-04-18/pdf/FR-1983-04-18.pdf.

5. Section 302(a)(5)(B) of the NWPA states that "in return for the payment of fees established by this section, the Secretary, beginning not later than January 31, 1998, will dispose of the high-level radioactive waste or spent nuclear fuel involved as provided in this subtitle."

6. Blue Ribbon Commission on America's Nuclear Future, "Full Statement of Congressman Lee Hamilton and General Brent Scowcroft, Co-Chairmen, Before the Committee on Energy and Natural Resources, US Senate," February 2, 2012, p. 9, https://www.energy.senate.gov/services/files/E511F27B-B971-41B0-81AD-BF05D12AA248.

7. The original NWPA laid out a process where two SNF disposal sites would be identified by the executive branch and submitted to Congress for approval by specified dates. However, Congress would amend the NWPA in 1987 and designate only one site—Yucca Mountain in Nevada—to be characterized for potential disposal of SNF. The site was approved by Congress in 2002, but state opposition to the project has prevented any appropriations from moving the project forward since 2010.

8. "US spent fuel liability jumps to $44.5 billion," Nuclear Newswire, Radwaste Solutions, American Nuclear Society, November 27, 2024, https://www.ans.org/news/article-6587/us-spent-fuel-liability-jumps-to-445-billion/.

9. Ibid.

10. The old standard contract and the amended standard contract are available on the DOE's "Office of Standard Contract" website, https://www.energy.gov/gc/office-standard-contract-management.

11. US Department of Energy, "Standard Contract for Disposal of SNF and/or HLW (Redline New Reactor Amendment)," June 2024, https://www.energy.gov/sites/default/files/2024-06/Standard%20Contract%20_Redline%20New%20Reactor%20Amendment.pdf. (See Article I(14) definition of "performance date" and Article II [Scope].)

12. "Statement of Dr. Kristina M. Johnson, undersecretary of Energy, US Department of Energy, Before the Committee on the Budget, US House of Representatives," July 27, 2010, https://www.energy.gov/sites/default/files/ciprod/documents/Final_Testimony_for_July_27.10.pdf.

13. The paragraph in question from Article IX is: "Neither the Government nor the Purchaser shall be liable under this contract for damages caused by failure to perform in performance or initiating performance of its obligations hereunder, if such failure arises out of causes beyond the control and without the fault or negligence of the party failing to perform. In the event circumstances beyond the reasonable control of the Purchaser or DOE—such as acts of God, or of the public

enemy, acts of Government in either its sovereign or contractual capacity (including, but not limited to, acts or inaction of Congress that, outside the control of DOE or Purchaser, affect DOE's ability to accept or the Purchaser's ability to deliver, SNF in a timely manner), fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather—cause delay in scheduled delivery, acceptance or transport of SNF and/or HLW, the party experiencing the delay will notify the other party as soon as possible after such delay is ascertained and the parties will readjust their schedules, as appropriate, to accommodate such delay."

14. OECD, "Environmental and ethical aspects of long-lived radioactive waste disposal," proceedings of an international workshop, Nuclear Energy Agency and Environmental Directorate, September 1–2, 1994, https://www.oecd-nea.org/upload/docs/application/pdf/2019-12/nea120-environmental-ethical-aspects.pdf.

15. For example, MIT, "The Future of the Nuclear Fuel Cycle," 2011; Blue Ribbon Commission on America's Nuclear Future, 2012; and most recently, Lake Barrett et al., "The Path Forward for Nuclear Waste in the US: A Bipartisan Solution to the Nuclear Waste Problem," January 15, 2026, https://sppga.cms.arts.ubc.ca/wp-content/uploads/sites/5/2026/01/Path-Forward.2026.pdf.

16. For example, S.512, the Nuclear Energy Innovation and Modernization Act (NEIMA), had 11 Republican cosponsors and 7 Democratic cosponsors in the Senate, and in 2018, NEIMA passed the Senate by voice vote and the House by a vote of 361 to 10 to become public law 115-439; S.1111, the ADVANCE Act, had 9 Republican cosponsors and 11 Democratic cosponsors in the Senate, and in 2024, the Senate voted 88–2 to add the ADVANCE Act to S.870, which became public law 118-67.

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