



Department of Energy

Washington, DC 20585

September 9, 2024

SEP 19 2024

Dr. Nathan Siu
Chair
Nuclear Waste Technical Review Board
2300 Clarendon Boulevard
Suite 1300
Arlington, VA 22201-3367

Dear Dr. Siu,

The U.S. Department of Energy's (DOE) Office of Nuclear Energy appreciates your letter of August 24, 2023, which summarized the Nuclear Waste Technical Review Board's 2023 Spring Public Meeting. During the meeting, held March 28, 2023, in Orlando, Florida, information was presented by DOE and national laboratory participants on DOE's activities related to transportation plans for and evaluations of commercial spent nuclear fuel (SNF) and high-level radioactive waste (HLW). Additionally, activities related to the consent-based siting process for siting one or more federal interim storage facilities were discussed.

The Board's letter provided findings and recommendations on these DOE activities.

DOE thanks the Board for their input and looks forward to its future insights on DOE's activities related to the management and disposal of SNF and HLW.

The enclosure provides the DOE's responses to the Board's specific findings and recommendations. If you have any questions on the responses, please contact Erica Bickford at erica.bickford@nuclear.energy.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Michael Goff".

K. Michael Goff
Acting Assistant Secretary
Office of Nuclear Energy

Enclosure

DOE Responses to NWTRB Board's Comments, Observations, Findings, and Recommendations in their letter to Assistant Secretary for Nuclear Energy, Dr. Huff, dated August 24, 2023

NWTRB Board Comment 1a:

The Board finds that DOE is making progress in its IWM program, particularly in three major cross-cutting areas: (i) transportation preparations, (ii) storage design and regulatory considerations, and (iii) systems analysis tools and integration. The Board recognizes that DOE activities related to CBS of a federal interim storage facility are in the early stages of a multi-year effort.

DOE Response:

The U.S. Department of Energy (DOE) appreciates the Board's finding regarding the progress of the Office of Integrated Waste Management, which as of an April 2024 office reorganization is now divided into two separate offices, the Office of Storage and Transportation (S&T) and the Office of Consent-Based Siting. In the past few years IWM has hired over 10 new employees to support execution of the program mission to site one or more federal consolidated interim storage facilities, using a consent-based siting process, ready to receive spent nuclear fuel (SNF) as soon as practicable. While still in the first stage of DOE's Consent-Based Siting Process for Federal Consolidated Interim Storage of Spent Nuclear Fuel (2023), the program looks forward to building capacity and engaging in broader conversations with the public, interested stakeholders, State and Tribal government partners, and others through our 12 Consent-Based Siting Consortia awardees along with other new and ongoing Departmental activities.

NWTRB Board Comment 1b:

The Board finds that incorporating public feedback in the early development of a Package Performance Study is important; the Board previously encouraged DOE to engage early with stakeholders in developing a plan. To date, DOE has obtained limited feedback from a few groups, but has not yet received broad public feedback on its early plans for a Package Performance Study.

If DOE pursues a Package Performance Study, the Board recommends that DOE first determine what the public's major safety concerns are, how public participants would like to be involved, and how meeting this goal can be integrated with regulatory testing goals. This will better enable DOE to identify the key issues to be addressed and to set clear outcomes for any demonstration. Further, planning for the demonstration should include a strategy for effective communication of test goals, expectations, and results to the public, and for a post-demonstration assessment of how well the test met its goals.

DOE response:

IWM's (now S&T's) primary motivation for pursuing a package performance study (PPS-now being called a package performance demonstration, or PPD) is to build public trust and confidence in the safety of transporting SNF to federal storage and disposal facilities in general,

and specifically transportation by rail. For a PPD to be successful, incorporating perspectives of key partners, such as State and Tribal governments who have primary responsibility for public safety within their jurisdictions, communities who may consider hosting a federal storage or disposal facility, members of the public, and other stakeholders is critically important.

However, a PPD is currently estimated to cost between \$50 - \$100 million dollars over up to 5 years, depending on the scope and scale of the demonstration(s) and any potential cost-sharing with project partners. Previous attempts have been made over the last 25 years by the Nuclear Regulatory Commission (NRC) and S&T predecessor programs at DOE to conduct a PPS, yet none moved beyond the planning stages. Until S&T has confidence that appropriations will be available to execute a PPD, outreach and engagement on such a demonstration is being carefully managed to limit the risk of building up expectations that will ultimately go unfulfilled and undermine the objective of building public trust and confidence. In May 2024, DOE approved Critical Decision-0 (CD-0), Approve Mission Need for the Federal Consolidated Interim Storage Facility (CISF) Project. Obtaining CD-0 is the first step (of a 5-step process) under the DOE rules for project acquisition. The PPD was included as a component of that project for the purposes of mitigating risk for large-scale transportation of spent nuclear fuel. The CISF Project, including the PPD, are expected to be submitted in future budget requests as a project line-item, which provides a measure of confidence for S&T to continue the PPD engagement process that it has already begun.

Subsequent to the March 2023 NWTRB public meeting, S&T, developed a draft stakeholder engagement plan (the Plan) for a PPD that is being reviewed and discussed internally. It is a flexible plan for evaluating and engaging a broad spectrum of stakeholders including Federal agencies, States, Tribes, emergency responders, emergency planners, industry, and interest groups, and to the extent practicable, members of the public.

The Plan is a concept for determining what kind of input stakeholders can reasonably provide for consideration regarding the design and implementation of a PPD; methods for interacting with and eliciting feedback from stakeholders (such as public comment periods, requests for information (RFI), virtual meetings, etc.); how outcomes from a package performance demonstration could best be used for respective stakeholder groups to increase stakeholder confidence in DOE's transportation plans; and what research needs may be able to be met through a PPD. Some of the aspects of the Plan have evolved as the project has evolved and as initial feedback has been received, but the team continues to operate under an engagement strategy framework consistent with the Plan that will allow effective external engagement over the planned 5-year process. An updated draft Plan was developed in June 2024. S&T has recently published the RFI July 2024 seeking input from the general public, cask vendors, testing facilities, and marketing/PR firms on approaches to conducting the PPD. The 60-day open input period closes on September 30, 2024. Depending on the interest and requests, DOE may opt to extend the input period for 25 to 30 days.

To date, DOE has already collected significant feedback that contributed to development of the RFI and updating the Plan. Working within the framework described in the Plan, S&T began conducting focused external engagement on a PPD in October 2023. At the time, the DOE team began seeking informal feedback from various stakeholder groups by giving presentations to

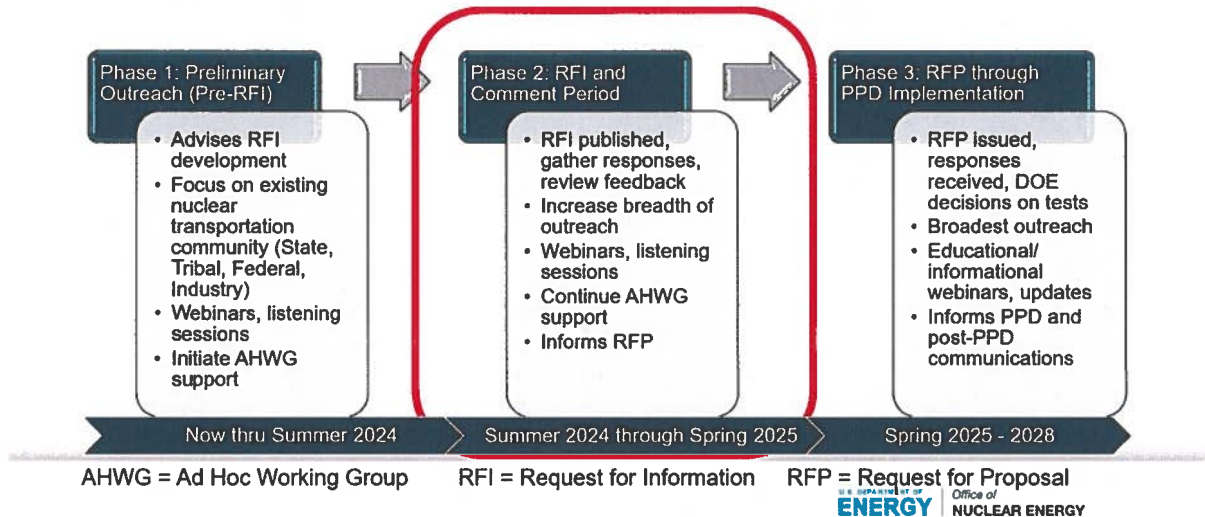
introduce the topic and ending in a Q&A session posing 6 initial questions for discussion. A limited list of engagements thus far includes:

- Nuclear Waste Strategy Coalition Meeting (October 2023)
- Western Interstate Energy Board's (WIEB) High-Level Radioactive Waste Committee Fall Meeting (November 2023)
- National Transportation Stakeholders Forum (NTSF) Communications Ad-Hoc Working Group webinar (December 2023)
- Southern States Energy Board (SSEB) Radioactive Materials Transportation Committee Meeting (December 2023)
- NRC-hosted "Nuclear Communicators" Meeting (January 2024)
- The 37th INMM Spent Fuel Seminar presentation (January 2024)
- Tribal Radioactive Materials Transportation Committee (TRMTC) Mid-year Meeting (January 2024)
- Federal Railroad Administration (FRA) and Pipeline and Hazardous Materials Safety Administration (PHMSA) introduction meeting (February 2024)
- Council of State Governments- Midwest Radiological Materials Transportation Committee webinar and listening session (March 2024)
- WM Symposia conference panel presentation and technical presentation (March 2024)
- NRC Internal Staff Seminar (March 2024)
- DOE-NE's Transportation Core Group presentation (March 2024)
- NEI Used Fuel Working Group presentation and listening session (March 2024)
- TRMTC listening session (April 2024)
- NEI Used Fuel Conference presentation and Q&A panel session (May 2024)
- National Transportation Stakeholder Forum multiple presentations (June 2024)

The presentations generated wide-ranging and generally positive feedback that provided invaluable input to the draft RFI and the updated Plan.. For a visual description of the Plan and its different phases, please see the graphic below.

As developing the Plan moves forward, S&T would be happy to brief the Board on the progress of the PPD and stakeholder engagement efforts.

Proposed Phased Approach



NWTRB Board Comment 3:

The Board commends DOE for continuing to work closely with Tribes and finds that the Office of IWM emphasis on making Tribal government engagement a priority is a positive step for CBS efforts. The Board also commends DOE for working to identify practical steps to enhance full participation, including efforts to engage with Tribes through its NTSF section 180(c) ad hoc working group, and with Tribal governments through NETWG and TRMTC.

The Board commends DOE for looking into developing metrics (i.e., ways to measure and evaluate Tribal engagement and progress) to assess or track the extent to which such efforts have been successful, as each Tribal government is independent and will be facing a variety of situations that are unique to its Tribe. The Board looks forward to seeing more detailed information about such metrics at future Board meetings.

The Board observes that some Tribes may lack adequate resources for emergency preparedness and response programs, which could hamper the Tribes' ability to support DOE activities to plan for future SNF transportation. However, as noted above, the Board recognizes DOE for its ongoing preparedness work with the Tribes, primarily through its renewed efforts relative to section 180(c) of the Nuclear Waste Policy Act. The Board believes that, through Tribal engagement, DOE can help Tribes plan for the necessary emergency preparedness and response, technical expertise, and capabilities.

DOE Response:

DOE thanks the Board for its observations on IWM's Tribal engagement activities to date.

Consistent with DOE Order 144.1, *Department of Energy American Indian Tribal Government Interactions and Policy*, this work now under S&T and the Office of Consent-Based Siting, both of which are committed to fulfilling its trust responsibility to federally recognized Tribes and engaging with Tribes on a government-to-government basis as preparations for implementing a federal consolidated interim storage facility (CISF) and associated transportation capability develop.

The Offices appreciate the willingness of many Tribes to engage in discussions with DOE on long-lead time activities and provide their perspectives and insights on historical and planned future DOE projects. Through these engagements, both Offices have been made aware of the unique circumstances, needs, and concerns of different Tribes that has informed IWM programs and planning over the past decade. The work the Board referenced through the National Transportation Stakeholders Forum (NTSF) Section 180(c) ad hoc working group, including the Section 180(c) Proposed Policy Implementation Exercise conducted by State and Tribal ad hoc working group members from 2015-2017, was instrumental in bringing to light significant differences in preparedness and capabilities among States, among Tribes, and between Tribes and States. For example, Tribes and States that had prior experience with radioactive materials shipments from DOE Waste Isolation Pilot Plant (WIPP) or Foreign Research Reactor programs had a basis from which to adapt and build training programs for DOE SNF shipments. Tribes and States that did not have that experience will likely need additional support in developing approaches to training and public outreach in their jurisdictions.

Additionally, the NTSF Rail/Routing ad hoc working group is co-chaired by a representative from the Prairie Island Indian Community. An outstanding example of Tribal coordination and support is evident in a first-of-a-kind collaboration, IWM and the Prairie Island Indian Community jointly planned and conducted in July 2022 a transportation dose assessment to estimate the site-specific incident-free radiation doses from SNF that is expected to be transported by rail in the future from the Prairie Island Nuclear Generating Plant (PINGP) through the Prairie Island Indian Community Reservation and Trust Land.

The new Office of Storage and Transportation and Office of Consent-Based Siting continue to adapt and update its approach to Tribal engagement around program activities as well. While IWM has invited Tribal (and State) government representatives to join its nuclear power plant infrastructure assessments since 2013, invitations were handled informally to Tribal representatives IWM staff had existing contact information for. Recent infrastructure assessments have intersected with federally recognized Tribes that IWM did not have prior engagement or contact information for. S&T has since developed a formal invitation process for Tribes within the areas of future nuclear power plant infrastructure assessments to communicate on a government-to-government basis, provide connection to resources such as the TRMTC, and contextual information on the offices' work and why a Tribe may be interested to engage with DOE.

For consent-based siting work, now in the Office of Consent-Based Siting, engagement with Tribes was built into the requirements for consent-based siting consortia awardee projects, and Tribes were directly informed by postal mail of the funding opportunity. Consequently, some consortia awardees are partnering or engaging with Tribal Nations or Tribal organizations to

understand their perspectives and needs, engage in mutual learning, and provide resources. Additionally, DOE national laboratories have invited Tribes to participate in their pilot work to understand the perspectives of communities that currently host spent nuclear fuel at operating and shutdown nuclear reactor sites, and work to develop recommendations for Tribal engagement and consultation. Internal to DOE, analysis is being conducted to incorporate Tribal-specific outreach and engagement strategies into overall consent-based siting engagement approaches. A new task order has been initiated to develop a Tribal engagement strategy developed directly by Tribal nations and Tribal representatives. This work is still in early stages and will be rolled out as it matures. The now distinct Office of Consent-Based Siting looks forward to continuing and growing engagement with Tribes in all areas of IWM's program and working with them to understand their perspectives and needs, so that this feedback can continue to be incorporated in programmatic future activities and operations. DOE would be happy to share information with the Board on progress engaging with Tribes going forward.

NWTRB Board Comment 4:

The Board finds that the DOE-sponsored site evaluations provide a good opportunity for DOE to meet with onsite staff and discuss technical details, including SNF condition, anomalies, and canister loading maps.

During future site infrastructure evaluation visits, the Board recommends that DOE engage with site personnel and cask vendors regarding the NRC-approved transportation CoCs that apply to SNF in dry storage and assess whether the stored SNF will meet the requirements in the NRC-approved transportation CoCs. Site personnel and cask vendors who know the specific SNF contents for each storage canister and the approved contents for the transportation cask could potentially identify whether amendments or exemptions to the transportation CoCs will be needed prior to transportation.

DOE Response:

The Department agrees that IWM's, now under S&T, nuclear power plant infrastructure assessments have provided valuable information to support transportation planning for commercial SNF and understanding whether as-loaded SNF is likely to be transportable through straight forward updates to NRC certificates of compliance (CoCs) to canisters and/or casks, or whether there may be challenges with transporting as-loaded SNF. In conducting infrastructure assessments, the S&T team sends a list of questions to the site in advance, which includes questions on the condition and configuration of the as-loaded SNF and casks and/or canisters in use at the site or planned to be used moving forward, where questions about amendments or exemptions to CoCs can be added. To date, only two sites of 22 visited had SNF loaded into canister or cask systems that may have significant challenges to certify for transport.

Additionally, NRC staff have been present at or invited to join some of S&T's more recent infrastructure evaluations and have added value to the discussions and information obtained. Continuing this work, S&T is considering extending the offer of NRC participation to all future infrastructure evaluations, subject to NRC staff availability and travel resources. S&T staff also continue to meet quarterly with NRC staff to exchange information on program activities and identify challenges and opportunities in topics of mutual interest, including any significant gaps

to close prior to commencing operation of a federal CISF and associated transportation of SNF. S&T is considering suggesting as a topic for a future quarterly meeting with NRC is whether and/or how changes made to SNF in a storage configuration under 10 CFR 72.48 propagate into transportation cask CoCs under 10 CFR Part 71.

Board Comment 5:

The Board commends DOE for sponsoring the as-loaded analyses needed to understand which commercial SNF canisters can meet the requirements of the corresponding transportation CoCs and which cannot, without an NRC-approved amendment or exemption to the CoC.

The Board observes that access to UNF-ST&DARDS would be valuable to the nuclear industry for analyses of SNF canisters for loading, storage, and transportation scenarios. The Board finds that DOE can enhance its IWM system planning by engaging early with the NRC regarding the need for amendments or exemptions to the transportation CoCs for SNF canisters that do not currently meet the CoC requirements.

The Board recommends that DOE work with the NRC to identify the number and scope (including potential technical challenges) of amendments or exemptions to transportation CoCs that will be needed to allow the transportation of the affected SNF canisters.

DOE Response:

DOE agrees that it would be beneficial to identify any need for transportation package CoC amendments or exemptions well in advance of transport of SNF from a site. The Department is also mindful of its planned future role as a license applicant to the NRC, and the need for appropriate separation of technical analysis tools and personnel to ensure independent technical reviews are appropriately independent. S&T plans to coordinate with nuclear power plant sites and vendors to identify status of CoCs, data needs, and timelines for amending them. S&T currently plans for nuclear power plant sites to have at least five years advance notice before DOE arrives to accept SNF, during which time it is currently understood from discussions with NRC staff and recent DOE experience through the High-Burnup Demo Project CoC review process, that most transportation cask CoCs could be amended, as needed. In the interim, S&T will continue to assess the status of CoCs and anticipated amendment needs as new nuclear power plant site infrastructure evaluations occur, making use of the STANDARDS spent fuel analysis tool, formerly known as UNF-ST&DARDS, which is being further enhanced for potential commercial use by the US nuclear industry.

Board Comment 6:

The Board finds that there may be some technical difficulties with meeting the 10 CFR Part 72 requirements for SNF storage following the transportation of SNF, governed by 10 CFR Part 71. For example, 10 CFR Part 72 requires the licensee to demonstrate that the SNF cladding can meet its intended confinement function before placing the SNF into dry storage; but it is unclear how the licensee will demonstrate adherence to this requirement for SNF inside a welded canister.

The Board recommends that DOE expand its engagement with the NRC to understand the

technical difficulties with respect to meeting the 10 CFR Part 72 requirements for storage following the transport of commercial SNF, subject to 10 CFR Part 71 requirements. Recognizing that the issues could be different and unique for each specific SNF cask loading and for each cask or canister design, this action should commence well in advance of starting a large-scale transportation campaign, such as one that DOE may start in support of a new federal interim storage facility.

DOE Response:

DOE recognizes there are different requirements between 10 CFR Part 72 and 10 CFR Part 71 regarding fuel condition and protection. DOE is also aware of NRC questions regarding the situation where as-loaded SNF in a storage configuration under 10 CFR Part 72 will be placed into a transportation cask under 10 CFR Part 71 and then placed back into a storage configuration at a CISF under 10 CFR Part 72. The SNF and canisters that have been in storage at an Independent Spent Fuel Storage Installation (ISFSI) for 20 years or longer are subject to an NRC-approved aging management program, whether at the originating site or at a federal CISF.

DOE has been working to monitor and examine approaches to address questions on this topic known as the "72 - 71 -72" issue. For example, some activities such as SNF loading which are performed by utilities can be demonstrated by a review and transfer of appropriate records packages prior to receipt of a canister at a federal CISF. This approach is similar to that utilized in the licensing processes for private CISFs.

S&T currently has quarterly senior level meetings with NRC staff that provide a means to exchange information on technical research activities that are crosscutting for both transporting and storing SNF. For example, prior technical exchanges have included discussion of the need for canister testing to ensure the canister confinement boundary integrity following shipment. The now S&T program has developed a test program to investigate the testing methodology and is currently procuring the necessary equipment in FY24 with testing scheduled for FY25. Additional exchanges with the NRC are expected in this topical area as work proceeds.

S&T currently expects that NRC licensing requirements can be met, including aging management, for commercial SNF placed back into storage at a federal CISF.