WYOMING LEGISLATIVE SERVICE OFFICE

Memorandum

DATE November 4, 2019

TO Joint Minerals, Business and Economic Development Interim Committee

FROM Spent Fuel Rods Subcommittee

SUBJECT Subcommittee Report and Recommendations

This is a summary of the activities and recommendations of the Spent Fuel Rods Subcommittee. The documents referenced in this report are part of the Subcommittee's meeting materials and are available **here**.[1]

Subcommittee members are Senator Anderson, Chairman; Senators Bebout and Coe; and Representatives Burkhart, Crank, Duncan, and MacGuire.

Approved Interim Topic

Management Council approved the creation of a subcommittee "to investigate whether the storage of spent nuclear fuel rods in Wyoming is logistically, economically and environmentally viable." The Subcommittee is required to report its findings to this Committee by October 15, 2019, and the Subcommittee was authorized to coordinate with the Wyoming Department of Environmental Quality and the United States Department of Energy.

Meeting and Information Received

The Subcommittee met for one day in Casper in early September 2019. The Subcommittee received information from the Nuclear Regulatory Commission, the Department of Energy, the Wyoming Department of Environmental Quality, and a retired nuclear physicist and Wyoming resident. The Subcommittee also accepted public

[1] **https://www.wyoleg.gov/Calendar/20190901/Meeting?type=committee&id=12069**.

comments at the meeting and through the Legislature's website. A summary of the testimony follows.

Nuclear Regulatory Commission

John McKirgan, Branch Chief, Spent Fuel Licensing Branch; and Michael Layton, Director, Division of Spent Fuel Management, addressed the Subcommittee on behalf of the United States Nuclear Regulatory Commission (NRC).[2] They gave an overview of the NRC, which regulates commercial nuclear power plants and non-power nuclear reactors and the transportation, storage, and disposal of nuclear materials and waste. They noted that the NRC regulates only civilian uses of nuclear material; nuclear material for military uses is not within their purview.

For spent fuel, the NRC is an independent regulator, and its primary role is to protect public health, provide for common defense and security, and provide for environmental safety through, in part, the licensing of independent spent fuel storage facilities.

Mr. McKirgan and Mr. Layton outlined the process for applying for a license for an interim storage facility. After an applicant applies, the NRC accepts the application and begins three processes. First, the NRC conducts a safety review and prepares a safety analysis report. Part of this review includes an analysis of the site's potential to maintain storage safety during abnormal events (including extreme temperatures and earthquakes), assurance of worker safety, the ability to maintain retrievability of the spent fuel, and the site's local geology vis-à-vis the proposed design standards for storage.

Second, the NRC conducts an environmental review that culminates in an environmental impact statement that comprehensively assesses the environmental impacts of the proposed storage facility. As part of this review, the NRC offers opportunities for public comment and input.

Third, the NRC provides an opportunity to interested parties to request an adjudicatory hearing before a three-judge licensing board of the NRC's Atomic Safety and Licensing Board Panel. Hearings may be held on contested parts of the license application, including safety, security, and environmental issues. The NRC takes no final action until after the Panel issues an initial decision after the hearing, if a hearing is held. The speakers noted that, if hearings are held, the NRC endeavors to hold them in locations close to whether the storage facility would be located.

[2] NRC presentation, **Appendix 2-01**.

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After these three steps are completed, the NRC decides on the application. If the application is approved, NRC staff can then issue a storage license for an initial term not to exceed 40 years. Once the license and technical specifications are issued, a licensee can then begin construction and operation of the facility. Mr. McKirgan and Mr. Layton noted that the licensing process generally takes three years, although they noted that one recent application process took nine years.

After licensure, the NRC maintains oversight of facilities. Subcommittee members asked questions regarding violations or problems with storage facilities. The speakers noted that inspections have identified violations of NRC requirements and rules regarding safety and security. The speakers did not discuss specifics, but they noted that the violations had not resulted in a release of radioactive material.

The Subcommittee also asked questions regarding bonding and financial assurance. The speakers noted that storage facilities had insurance policies to cover accidents, noting that one facility in the region had a $100 million insurance policy.

Finally, the NRC speakers discussed oversight of the transportation of spent fuel. The NRC works with the federal Department of Transportation, which regulates the carriers and modes of transport while the NRC regulates the design standards for the containers in which the material is transported. Subcommittee members discussed previous experiences of spent fuel being transported around the country, including through Wyoming.[3]

Mr. Layton concluded by outlining follow-up information he would provide to the Subcommittee regarding the following:

- Inspection findings and types of violations at licensed facilities;
- Information for spent fuel storage based on the Price-Anderson Act's requirements;
- More readable NRC organizational charts;
- Links for demonstrations of storage containers and casks;
- Information on the NRC's extended storage policy statement;
- An estimate of the footprint/land required for dry casks.

Department of Energy

[3] The NRC provided two additional materials: **Appendix 2-02**, Safety of Spent Fuel Storage, and **Appendix 2-03**, Safety of Spent Fuel Transportation.

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William Boyle, Deputy Assistant Secretary for Spent Fuel and Waste Disposition; and Nick DiNunzio, Deputy Assistant Counsel, Nuclear Programs; presented on behalf of the United States Department of Energy (DOE). In response to Subcommittee questions regarding transportation, the speakers provided a handout addressing tests of containers used to transport spent nuclear fuel.[4]

The DOE speakers outlined the role the Department plays in licensing and constructing a monitored retrievable storage facility. The Department would apply to the NRC for a license for the facility; once approved, the Department would design and construct the facility, using federal funds to pay for the facility.

Mr. Boyle and Mr. DiNunzio discussed payments to the state for storage and issues with constructing a storage facility in Wyoming while complying with the federal Nuclear Waste Policy Act.[5] That federal law precludes the construction of a storage facility until the NRC has issued a license for the construction of a permanent disposal repository, which likely will be at Yucca Mountain, Nevada.[6] They noted that there is an active application for a license for Yucca Mountain that is suspended because of a lack of authorized funding for DOE to use to complete the application process. Federal law also limits the amount of nuclear material that can be stored at any temporary storage facility to 10,000 metric tons of heavy metal.[7]

The speakers also described how the Nuclear Waste Policy Act established a Nuclear Waste Fund to be used for, among other things, the design, construction, and operation of a permanent repository for spent nuclear fuel. Revenues for the Fund were collected by imposing a fee on each kilowatt-hour of electricity generated by a civilian nuclear power reactor.[8] The DOE further noted that, under federal law, the Department can enter into a benefits agreement with a state, but only one agreement can be in effect at any given time.[9] The Nuclear Waste Policy Act limits annual payments from the Nuclear Waste Fund to a state to: (1) a $5 million payment before the first receipt of spent fuel; (2) a $10 million payment upon the first receipt; and (3) a $10 million annual payment until the

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[4] **Appendix 2-04**.
[5] See 42 U.S.C. § 10101 et seq.
[6] 42 U.S.C. § 10168(d)(1).
[7] 42 U.S.C. § 10168(d)(3). A "metric ton of heavy metal" is a term of art to measure the mass of nuclear fuel. Heavy metal refers to elements with an atomic number greater than 89 (i.e. thorium, uranium, and plutonium) in the fuel. The masses of other materials in the fuel (like alloy, cladding, and structural materials) are not included in this measure. A metric ton is 1,000 kilograms.
[8] 42 U.S.C. § 10222(a).
[9] 42 U.S.C. § 10173.

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facility is closed.[10] The speakers noted that Congress could appropriate general funds for additional payments to the state. They also noted the possibility of a legal challenge by utility ratepayers who contributed to the Nuclear Waste Fund if the funds meant for a permanent repository at Yucca Mountain are used to pay a state for temporary storage.[11]

Mr. DiNunzio also discussed how a private entity arrangement for storage would develop, emphasizing that the DOE would not be involved in the licensing process. He also discussed the financial structure and issues associated with a private entity storing material. He noted that storage costs and potential payments may be around $730 million per year, based on the amounts that are currently being paid for storage costs and for damages to current facilities that are continuing to store spent fuel in light of Yucca Mountain not being completed as a spent fuel disposal facility.

Additional Information

Pete Davis, a retired nuclear physicist from Sheridan, addressed the Subcommittee.[12] He outlined the process by which Yucca Mountain was selected as a permanent repository for spent nuclear fuel. He described his work on the viability of Yucca Mountain as a facility, including security issues and potential attacks after the September 11 attacks. Mr. Davis noted that an aging facility would be constructed to allow the spent fuel to cool before it is placed directly into Yucca Mountain. He described a prime location as one that is close to a railroad spur and away from population centers; he also noted that constructing a berm around the project could provide natural protection and security.

Alan Edwards, Deputy Director, Wyoming Department of Environmental Quality, described Wyoming's current laws on radioactive waste storage facilities.[13] Generally, those statutes requires the NRC to approve any agreement for a storage facility, and the Legislature must approve siting before construction begins. The statutes provide an application process for an entity to follow to bring a storage facility to Wyoming.

[10] 42 U.S.C. § 10173a.

[11] Please note that this summary should not be construed as a legal opinion on the outcome of any potential lawsuit or how a court may interpret applicable federal law; this report simply summarizes the information the Subcommittee received.

[12] Mr. Davis provided **Appendix 5-02**.

[13] See W.S. 35-11-1501 et seq. These are available in **Appendix 5-01**.

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Public Comment

A summary of the public comment received at the meeting and through online comments follow.[14] Generally, speakers expressed the following points:

- A general opposition to any storage of spent fuel in Wyoming.
- Concerns with whether temporary storage would become de facto permanent storage due to a lack of progress with Yucca Mountain.
- Concerns with the safety of storage in Wyoming, including:
    - The potential for release or leakage from dry casks;
    - Negative impacts on citizens, wildlife, and state land and resources;
    - Reclamation issues, particularly given the other industries and resources that will need reclamation in the future;
    - The viability of storage casks, particularly as they age;
    - The risk of earthquakes affecting storage;
    - Potential impacts to groundwater
- There's a need to study this issue further before committing, and a need to ensure that federal funding to pay the state for storage is stable and guaranteed.
- Further study is not necessary, and funds shouldn't be spent to study the issue.
- Concerns about the state's role in regulating and overseeing a storage facility.
- Spent fuel should be reprocessed, which would reduce storage and disposal issues.
- Concerns with transporting spent nuclear fuel across Wyoming and safety issues associated with transportation, including:
    - The reliability of storage containers and vehicles used for transportation;
    - Transportation of spent fuel during adverse weather;
- An appreciation for looking at economic diversity but encouraging consideration of other options instead of spent fuel storage.
- Concerns with revisiting previous efforts to bring nuclear fuel storage to Wyoming.
- Concerns with how storage will affect Wyoming's reputation for tourism and business.
- Concerns with unknown future costs to the state for storing material.
- Spent fuel should be stored where it was utilized.

Subcommittee Action and Recommendations

Overall, the Subcommittee expressed strong support for moving forward and further exploring the feasibility of a dry cask storage facility in Wyoming. The Subcommittee

[14] A compilation of online comments submitted is available in **Appendix 6-02**.

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discussed its satisfaction with how the Department of Energy and the Nuclear Regulatory Commission addressed questions regarding the safety of storing spent fuel in dry casks and transporting the material to and within Wyoming.

Senator Bebout moved for the Subcommittee to draft a report to the Committee with a summary of the Subcommittee's meeting and with its recommendations to the Committee. The motion passed by voice vote.

The Subcommittee recommends the following to the Committee:

- That the Committee consider sponsoring enabling legislation that would authorize further study of the viability of temporary dry cask storage of spent nuclear fuel in Wyoming;
- That the Committee consider sponsoring legislation that would enable the state (likely the Department of Environmental Quality and the governor's office) to begin discussions and negotiations with the Department of Energy for the licensing and construction of a dry cask storage facility in Wyoming.

The Subcommittee noted that, in order to bring a dedicated storage facility to Wyoming, an amendment to current statute would be necessary. W.S. 35-11-1506(e)(i) provides that a facility can only be authorized if "it is operated on the site of and to store the waste produced by a nuclear power generation facility operating within the state." The Subcommittee discussed the need to repeal that paragraph before a temporary storage facility and agreement with the Department of Energy could proceed.

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