UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 20, 2021

Mr. Eric Nielson
Student
University of Utah

Dear Mr. Nielson:

I am writing in response to your November 19, 2021, e-mail to the U.S. Nuclear Regulatory Commission (NRC) Commissioners in which you expressed an interest in the Commission's views on specific areas related to your Leap class at the University of Utah that is considering the sustainability of nuclear waste disposal. Your e-mail also refers to both wet and dry storage of nuclear waste, which I have interpreted to indicate the focus of your three questions is directed to the storage and disposal of spent nuclear fuel. As a subject matter expert on the geologic disposal of spent nuclear fuel, I was asked to respond to your inquiry on behalf of the NRC.

The NRC is the safety regulator for the storage and disposal of spent nuclear fuel. In that role, the NRC evaluates an applicant's proposals to determine compliance with NRC's regulations for protection of public health and safety, and the environment. For geologic disposal of spent nuclear fuel, the U.S. Department of Energy (DOE) is the government agency responsible for developing a high-level waste repository, which would be regulated by the NRC. We distinguish between *storage* (temporary or interim) and *disposal* (permanent). The NRC website contains pages under the 'nuclear waste' tab that you may find useful for your Leap class presentation that describes our role for both storage and disposal as well as background information.

Wet storage in spent fuel pools is developed as part of the nuclear power plant's operations. When a reactor is refueled, old or spent fuel is removed and placed in the pool. Once it has cooled sufficiently (typically after about 5 years in the pool), it can be transferred to dry storage. Most U.S. nuclear power plants have both types of storage. The DOE could also develop and operate a dry storage facility. These facilities are approved by the NRC and subject to NRC oversight. You may find it useful to contact DOE for its insights on developing interim storage sites and a permanent repository. Here is a good contact:

Dr. William Boyle
U.S. Department of Energy
Office of Spent Fuel & Waste
e-mail: william.boyle@doe.gov

The NRC in its regulatory role does follow developments in spent fuel storage and disposal, in part to ensure its regulatory framework provides for reasonable assurance of adequate protection of public health and safety. Some NRC publications that might be useful for you include U.S. Nuclear Regulatory Commission technical report designation (NUREG)-2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear (Appendix B Technical Feasibility of Continued Storage and Repository Availability)"

(https://www.nrc.gov/docs/ML1419/ML14196A104.pdf) and NUREG-2214, "Managing Aging Processes in Storage (MAPS) Report" (https://www.nrc.gov/docs/ML1921/ML19214A111.pdf). The NRC website under the Radioactive Waste heading is another source of general information related to the storage and disposal of spent nuclear fuel (https://www.nrc.gov/waste.html). Our brochures on storage (https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0528/index.html) and transportation (https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0292/index.html) of spent fuel may also be helpful.

The NRC has received two applications to construct Consolidated Interim Storage Facilities (CISF) for spent fuel and conducted licensing proceedings for each facility. In April 2016, Waste Control Specialists LLC (WCS) submitted an application to NRC for a specific license to construct and operate a CISF at its site in Andrews, Texas. In March 2017, Holtec International submitted an application to NRC for a specific license to construct and operate the HI-STORE CISF, to be located in Lea County, New Mexico. The NRC staff commenced safety and environmental reviews for each facility and established Atomic Safety and Licensing Boards to rule on hearing requests for both facilities. In both proceedings, the Licensing Boards determined that none of the hearing petitioners proffered an admissible contention and denied their hearing petitions. The Licensing Boards' decisions were appealed to the NRC Commission, which ultimately upheld the Licensing Boards' initial decisions in both proceedings. Subsequently, the NRC issued a license to construct and operate a CISF to WCS; the license application for the Holtec International CISF remains under NRC review. More information about these CISF applications is available at the NRC website (https://www.nrc.gov/waste/spent-fuel-storage/cis.html).

Finally, you requested information on recent "breakthroughs" in the areas of spent fuel storage and disposal. As explained in NUREG-2157 (linked above), NRC's regulatory oversight has contributed to an excellent safety record for the storage of spent nuclear fuel. And after decades of geological research, no insurmountable technical or scientific problem has emerged to challenge the conclusion that safe disposal of spent fuel can be achieved in a mined geologic repository. The NRC is not aware of any recent technical "breakthroughs" — or even the need for "breakthroughs" — to ensure continued safe storage of spent fuel or demonstrate the feasibility of a safe repository. However, a political breakthrough is needed. Experience here in the United States and in other countries demonstrates that technical knowledge and experience alone are not sufficient to create the broad social and political acceptance needed to construct a repository. In fact, DOE recently announced it was restarting the consent-based siting program for spent nuclear fuel (https://www.energy.gov/articles/doe-restarts-consent-based-siting-program-spent-nuclear-fuel-requests-input-interim).

Thank you for your interest in the sustainability of storage and disposal of spent nuclear fuel. I wish you well in your studies.

Sincerely,

Timothy McCartin

Tim McCartin
Senior Advisor for Performance Assessment
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

cc: W. Boyle, DOE

SUBJECT: RESPONSE TO UNIVERSITY STUDENT ERIC NIELSON'S E-MAIL NOVEMBER 19, 2021, DATED: December 20, 2021

Ticket: LTR-21-0308-2

DISTRIBUTION:
RidsSECYMailCenter
RidsEDOMailCenter

ADAMS Accession Nos.: ML21324A005 (pkg), ML21342A390 (ltr)

OFFICE:	NMSS/DFM	NMSS/DFM	OPA
NAME:	TMcCartin	SHelton	DMcIntyre
DATE:	12/9/2021	12/13/2021	12/14/2021
OFFICE:	OGC	NMSS	NMSS
NAME:	TCampbell	CGoode	RLewis for JLubinski
DATE:	12/14/2021	12/16/2021	12/20/2021

OFFICIAL RECORD COPY