

DOE DIRECT CONTRACT
ENVIRONMENTAL CHECKLIST

DIRECTIONS: Complete this form by following the instructions found at the beginning of each section and submit with project proposal.

SECTION A. Descriptive Information: Provide project title, offerer, and contact information.	
Project Title:	Shipment of Sister Rods from North Anna to INL
Offerer:	Electric Power Research Institute
Offerer Contact:	Keith Waldrop
Telephone Number & Email Address:	704-595-2887; kwaldrop@epri.com

Project Description:

The Department of Energy (DOE) has performed recent assessments focusing on long-term aging issues important to the performance of the structures, systems, and components of the dry cask storage systems for high burnup spent nuclear fuel. A number of technical issues and research and data needs have emerged from these assessments. DOE has determined that a large scale cask research and development project using various configurations of dry storage cask systems and experiments would be beneficial. This work is being initiated under a project titled the "High Burnup Dry Storage Cask Research and Development Project (HDRP)". While the HDRP project is being performed, baseline data for the SNF rods is needed for future comparison. As part of their Statement of Work, Electric Power Research Institute (EPRI) will:

- Design, License (through the NRC), and implement a modification to the TN-32B cask and cask lid to allow for instrumentation,
- Select 32 high burnup SNF assemblies from Dominion Virginia Power's North Anna Power Station that show various characteristics of high burnup fuel,
- Identify 25 sister rods to be pulled from the 32 assemblies,
- Load the 25 sister rods into a NAC-LWT cask and ship them to the Idaho National Laboratory for storage and post irradiation examination (PIE),
- Load the 32 high burnup assemblies into the TN-32B cask and transport the cask onto the North Anna Independent Spent Fuel Storage Installation (ISFSI),
- Monitor the cask for a period of 10 years.

The design, licensing, and implementation of the modification to the TN-32B cask and cask lid, as well as, the loading, transporting, and monitoring of the 32 high burnup assemblies and cask will be performed under the Dominion Virginia Power NRC license.

A 'sister rod' is a rod that has been determined to have very similar characteristics to those that will be stored in the Research Project Cask. There are two potential donor fuel assembly sources for sister rods: assemblies having similar operating histories to those assemblies that are chosen for storage in the Research Project Cask or actual fuel assemblies selected for storage. Properties that must be similar in order to be considered a 'sister' are: same fuel type (e.g., Zircaloy-4, Zirlo, M5), same initial enrichment, same relative reactor core location, and the same reactor operating history. The sister rods are approximately 14 feet in length and collectively contain approximately 40 kg heavy metal. The 25 sister rods will be selected and pulled from 32 assemblies with possibly any of the following characteristics.

Cladding Material	Burnup Range (GWD/MTU)	Number of Assemblies Available	Last Irradiation	Manufacturer	Assembly Type
Standard and Low-tin Zircaloy-4	53-58	3	1989	Westinghouse	Lo-Par ²²
Zirlo	51 - 55	20	2004 - 2007	Westinghouse	V5H ²³
M5	52 - 67	11	2001-2010	AREVA	AMBW ²⁴
Low-tin Zircaloy-4	49 - 50	3	1994	Westinghouse	V5H

Data will need to be gathered from the sister rods to provide the baseline that future testing and observations will be compared to. Therefore, sister rods from fuel assemblies similar to those that will be loaded in the test cask/casks will need to be extracted from these assemblies and shipped to the Idaho National Laboratory for characterization work on the rods.

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The current plan is for DOE to accept ownership of the sister rods at the North Anna site boundary. EPRI is responsible for all logistics for the shipment from the North Anna site to the INL site boundary. Upon arrival of the sister rods to the INL, the NAC-LWT cask will be transferred to Materials and Fuels Complex's Hot Fuels Examination Facility (HFEF). The sister rods will be unloaded into the HFEF hotcell, and placed in a safe storage condition until future PIE can be performed on the sister rods. The exact PIE to be performed, as well as, the timing for the PIE is yet to be determined. The timing of the PIE work will largely be dependent on the funding provided by DOE-HQ and all work will be coordinated through the standard practices and procedures that the INL performs when performing work on SNF.

The sister rods are currently planned to be loaded and shipped to the Idaho National Laboratory in January 2016. The approximate distance from the North Anna Power Station in Virginia to the Idaho National Laboratory is approximately 2,300 miles.

SECTION B. Environmental Aspects / Potential Sources of Impact: Check the applicable box for the following environmental aspects by reviewing the applicability statements. Ask yourself, "How can this activity affect the environment".

Environmental Aspects Table			
Environmental Aspect	Applicability Statement	Yes	No
Air Emissions	Air emissions applies to operations or activities that have the potential to generate air pollutants including but not limited to radionuclides, chemical and combustion emissions, fugitive dust, and ozone-depleting substances. Includes activities that may break up, dislodge, disturb or block access to regulated asbestos-containing material (RACM), handle asbestos-containing material, manage asbestos waste, or conduct demolition of load bearing structural members, (including trailers).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Discharging to Surface-, Storm-, or Ground Water	Surface water or storm water contamination applies to activities that have the potential to contaminate Waters of the U.S., wetlands, ground water, or storm water that could reach Waters of the U.S.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disturbing Cultural / Biological Resources	Cultural resource disturbance applies to activities that have the potential to impact cultural resources, such as disturbing soils by grading, excavating, sampling, off-road vehicle use, or removing vegetation, as well as to personnel working in areas where cultural resources are located. It also applies to modification or demolition of historical buildings or structures, or activities that could result in loss or damage to these resources. Examples of cultural resources include buildings, structures or objects over 50 years old or those identified as historic due to special significance, archaeological resources, historic home sites, trails, and canals, and places or items of significance to Native Americans and/or others. In addition, activities that have potential to interact, disturb or affect wildlife or their habitat (e.g., soil disturbance) or activities involving revegetation or weed control.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Generating and Managing Waste	Regulated, hazardous or radioactive material and waste packaging and transportation applies to activities that generate, store, treat, or dispose hazardous, radioactive, mixed, industrial waste, or nanoparticle waste.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Releasing Contaminants	Releasing contaminants applies to activities that may release potentially hazardous contaminants into air, water, soil, or other non-contaminated or previously contaminated locations. These activities may include, but are not limited to, the use of industrial and laboratory chemicals; the use of radionuclides; hazardous, radioactive, and mixed waste treatment and decontamination operations; and contaminated soils disturbance. This aspect also applies to asbestos containing material (ACM) remediation; repair, replacement, and/or disposal of contaminated tanks and associated piping; and the handling and disposal of PCB-contaminated equipment and waste.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Using, Reusing, and Conserving Natural Resources	Use, reuse and recycling of resources applies to activities that use resources such as water, energy, fuels, minerals, borrow material, wood or paper products, and other materials derived from natural resources. It applies to activities that currently require use, reuse, and recycling as integral to the project such as the construction and operation of a LEED certified building. This applies to waste disposition activities including building demolition. This also applies to any activity that requires the use of natural resources such that use, reuse, or recycling should be incorporated into its implementation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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SECTION C. Describe Environmental Aspects: For each environmental aspect checked 'Yes', provide specific information such as types and amounts of chemicals, waste, effluent, or emissions; size of modification, soil disturbance; or type of tank, equipment, or process and pollution prevention measures for each item checked. Briefly discuss the potential environmental impacts that could occur from project activities.

Describe Environmental Aspects:

Air Emissions: PIE from this project will result in radioactive air emissions. Emissions from the MFC facilities will be within those historically generated and bounded by existing analyses. All radionuclide release data will be recorded as part of the HFEF continuous stack monitor and calculated and provided to Programs Environmental Support organization by January 31 of each year for the preceding calendar year as part of the INL Annual NESHAPs report to DOE. An APAD would be developed to ensure releases of radioactive airborne contaminants from this process do not result in an increase to the annual HFEF dose to the Maximum Exposed Individual.

The greenhouse gas emissions for the shipment would be approximately 4.5 tons.

Generating and Managing Waste: Project personnel would work with WGS to characterize and properly dispose of all waste. Irradiated sample debris and PIE waste could generate TRU waste and mixed TRU waste. To complete proposed work activities, it is necessary for the project to use the HFEF hot cell which contains both defense and nondefense related materials and contamination. Project materials will come into contact with defense related materials. It is impractical to clean out defense related contamination, and therefore, waste associated with project activities could be eligible for disposal at the Waste Isolation Pilot Plant (WIPP).

If generated, GTCC-like wastes would be sent to one of the facilities DOE is currently evaluating in the Environmental Impact Statement for the Disposal of GTCC LLW and GTCC-Like Waste. Spent nuclear fuel debris would be securely stored with DOE's spent fuel and spent fuel debris inventory awaiting a future disposal facility.

Using, Reusing, and Conserving Natural Resources: All materials would be reused and recycled where economically practicable. All applicable waste would be diverted from disposal in the landfill where conditions allow. Project personnel will use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible. The project will practice sustainable acquisition, as appropriate and practicable, by procuring construction materials that are energy efficient, water efficient, are bio-based in content, environmentally preferable, non-ozone depleting, have recycled content, or are non-toxic or less-toxic alternatives. New equipment will meet either the Energy Star or Significant New Alternatives Policy (SNAP) requirements as appropriate (see <http://www.sftool.gov/GreenProcurement/ProductCategory/14>).

FOR DOE USE ONLY	
NEPA Doc Number: DOE-ID-14-005	Solicitation #:
NEPA CX Applied: Covered under existing NEPA, see below	Contract Specialist: JoAnne Hanners
Approved: Signature/Date: <i>Juan Steen</i> 4/3/14	Project Manager: Melissa Bates

NRC License License SNM-2507, Docket 72-16

Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (1996).

Final Environmental Impact Statement for the Waste Isolation Pilot Plant (DOE/EIS-0026, October 1980) and Final Supplement Environmental Impact Statement for the Waste Isolation Pilot Plant (SEIS-I) (DOE/EIS-0026-FS, January 1990)

Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997)

U.S. Department of Energy (DOE), 2011a, "Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste," DOE/EIS-0375-D, U.S. Department of Energy, Office of Environmental Management, April 2011.

Justification:

The design, licensing, and implementation of the modification to the TN-32B cask and cask lid, as well as, the loading, transporting, and monitoring of the 32 high burnup assemblies and cask will be performed under the Dominion Virginia Power NRC license (License SNM-2507, Docket 72-16).

Transportation, receiving, and storing used nuclear fuel, as well as, research and development for used nuclear fuel management is covered by DOE's Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). The analysis includes those impacts related to transportation to, storage of, and research and development related to used nuclear fuel at the INL (see Tables 3.1 of the SNF Record of Decision (May 30, 1995) and Table 1.1 of the Amended Record of Decision [February 1996]. The EIS limits the number of shipments to the INL, and the proposed activities would fall within the limits of the EIS.

The potential for transportation accidents has already been analyzed in the SNF EIS (Section 5.1.5 and Appendix I-5 through I-10).

NEPA coverage for the transportation and disposal of waste to WIPP are found in Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997), respectively. The 1990 ROD also stated that a more detailed analysis of the impacts of processing and handling TRU waste at the generator-storage facilities would be conducted. The Department has analyzed TRU waste management activities in the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE /EIS-200-F, May 1997). The WM PEIS analyzes environmental impacts at the potential locations of treatment and storage sites for TRU waste; SEIS-II addresses impacts associated with alternative treatment methods, the disposal of TRU waste at WIPP and alternatives to that disposal, and the transportation to WIPP.

If generated, GTCC-like wastes would be sent to one of the facilities DOE is currently evaluating in the Environmental Impact Statement for the Disposal of GTCC LLW and GTCC-Like Waste.