

June 4, 2015

MEMORANDUM TO: Anthony Hsia, Deputy Director  
Division of Spent Fuel management  
Office of Nuclear Material Safety  
and Safeguards

FROM: Chris Allen, Project Manager **/RA/**  
Spent Fuel Licensing Branch  
Division of Spent Fuel management  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: SUMMARY OF MAY 13, 2015, MEETING WITH DOMINION TO  
DISCUSS AN UPDATE ON HIGH BURN-UP CASK  
DEMONSTRATION PROJECT (TAC NO. L24886)

#### Background

On May 13, 2015, a Category 1 public meeting occurred at the Three White Flint Building in Rockville, Maryland between Dominion staff and U.S. Nuclear Regulatory Commission (NRC) staff to discuss updates to the high burn-up cask demonstration project. Regulatory commitments were not made at the meeting. The list of meeting attendees is Enclosure 1. The discussion followed the agenda provided in Enclosure 2. Dominion provided meeting slides prior to the meeting and updated the material in the slides after the meeting. Both the original and the updated meeting slides can be found using Agencywide Document Accession Management System accession number ML15153A043.

#### Discussion

Dominion provided background and technical information on the fuel to be used in the demonstration project as well as the proposed loading pattern for the cask. NRC staff noted that thermocouples were not located in the positions at which fuel assemblies with the highest heat loads were located and asked why this was being done. The response indicated that, after choosing the thermocouple locations, it had been necessary to use fuel assemblies with higher heat loads in order to increase the temperature inside the cask, and changing either the thermocouple locations or the fuel assembly loading pattern would unfortunately not be practical at this point. While discussing the milestones presented at the meeting, NRC staff emphasized the need for a high quality application considering the aggressive eighteen month schedule proposed for approving the amendment request. Dominion also pointed out that, during the thermal soak period, gas samples would also be obtained.

When discussing cask specific information, NRC staff asked several questions. They inquired what temperatures were predicted for the cask basket, and although a specific temperature was not provided, the response indicated that structural analyses showed the basket would not exhibit inelastic behavior while storing the high burnup fuel. They asked if a single connection would be employed for both the thermocouples and the overpressure monitoring system. Though plans had not been finalized, Dominion indicated initial plans involved all

instrumentation being monitored by the overpressure system and data being obtained by separate equipment. They also asked about thermocouple leak test criteria in relation to the cask confinement boundary. In addition to stating the welds used to secure the thermocouples would be liquid penetrant tested, AREVA provided the leak test acceptance criteria in units of millibar-liter per second. Since staff was unfamiliar with these units, they asked how the leak test criteria compared to American National Standards Institute N14.5, and an answer was provided. Staff also questioned if the thermocouple would be able to preserve the containment boundary during a transportation accident. AREVA explained that the thermocouple connection would be severed prior to transport and a plate welded over the penetration. A leak test would be performed to insure the containment boundary integrity during transportation. When Dominion indicated that non-irradiated neutron absorber rods would be utilized, staff asked if burnup credit could be utilized instead, and AREVA responded that the burnup credit would be used in addition to criticality control components already incorporated into the basket and the non-irradiated neutron absorber rods being added.

In discussing proposed changes to the license and design basis, Dominion identified three different enrichments would be utilized for the fuel to be loaded, but indicated they may specify a single bounding enrichment when submitting the application. Dominion also indicated a change to the limiting conditions of operation would be necessary to allow for data collection. When Dominion discussed the design basis, staff asked if the spent fuel pool boron concentration would be increased during loading operations. AREVA responded that increasing the spent fuel pool boron concentrations was unnecessary due to the existing basket criticality components, the use of burnup credit and the addition of the unirradiated neutron absorber rods. In addition, AREVA stated a misload analysis would be performed.

During discussions of in situ cavity gas sampling, staff asked a question related to the height at which cavity gas samples would be obtained in identifying the presence of the fission product gas Krypton-85, Dominion responded that they anticipated little Krypton-85 gas. In addition, staff asked, if a leaking seal was identified after a cask cavity gas sample was obtained, how would the leaking component be identified. AREVA responded that a process was being developed. Staff also asked if release fractions had been justified, and an affirmative response was provided. Staff later asked for more detail on the calculation of the release fractions, and AREVA identified Interim Staff Guidance 5 has been utilized. Staff then asked how Interim Staff Guidance 5 had been expanded to address high burnup fuel, and AREVA responded that methodologies similar to those used for other Transnuclear storage casks had been employed. When staff inquired about radiation practices and dose rates associated with gathering data, Dominion replied that appropriate steps would be implemented to mitigate personnel exposure, and that site boundary dose calculations had been revised. When staff queried Dominion why they planned to address in situ gas sampling in a separate licensing action, Dominion responded that they were evaluating the best time and licensing method for obtaining NRC approval of the in situ cavity gas sampling.

After Dominion discussed their license renewal plans, staff inquired about Dominion's plans for a lead system inspection in support of their license renewal. Dominion indicated they intended to make use of several inspections which had been performed after the 2011 earthquake. When given the opportunity to participate, the public asked several questions about the licensing process such as what regulations were applicable to storage of irradiated fuel and when would Virginia residents be given a voice in the licensing process. Staff identified the regulations applicable to amending a license in accordance with Title 10 of the *Code of Federal Regulations* Part 72, and identified when the public would have the opportunity to participate in the licensing process. A question was also asked about the length of time for which the high

burnup cask would be licensed, and staff stated this information would be identified in the license. When questioned on the diversity of fuel types being loaded, staff explained that this project was trying to obtain data on a variety of fuel cladding types. There was also a question about the location of low burnup fuel information. Staff promised to make this information available. Another question was asked about the radiation levels emanating from the gas samples. Staff explained that dose rate information would be obtained during the gas sampling process to protect personnel sampling the cask cavity, and that appropriate measures would be implemented to ensure that radioactive material did not escape from the sampling container. The meeting was subsequently adjourned.

TAC No. L24886

Enclosures:

1. Meeting Attendees
2. Meeting Agenda

the licensing process. A question was also asked about the length of time for which the high burnup cask would be licensed, and staff stated this information would be identified in the license. When questioned on the diversity of fuel types being loaded, staff explained that this project was trying to obtain data on a variety of fuel cladding types. There was also a question about the location of low burnup fuel information. Staff promised to make this information available. Another question was asked about the radiation levels emanating from the gas samples. Staff explained that dose rate information would be obtained during the gas sampling process to protect personnel sampling the cask cavity, and that appropriate measures would be implemented to ensure that radioactive material did not escape from the sampling container. The meeting was subsequently adjourned.

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Distribution: NRC Attendees                      DMarcano  
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**ADAMS Package No.: ML15159B137 Memo: ML15159A588**

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**MEETING ATTENDEES**  
**Public Meeting with Dominion Virginia Power**  
**To Discuss the High Burn-Up Dry Cask Demonstration Project**

May 13, 2015

<b>NAME</b>	<b>AFFILIATION</b>	<b>NAME</b>	<b>AFFILIATION</b>	<b>NAME</b>	<b>AFFILIATION</b>
Mark Lombard	NRC	Tom Brookmire	Dominion	Jim Wood	EXELON
Michele Sampson	NRC	Richard Ridder	Dominion	Zita Martin	TVA
Aladar Csontos	NRC	David Tomlinson	Dominion	Kimberly Manzione	Holtec
Meraj Rahimi	NRC	Scott Luchau	Dominion	Ned Larson	Department of Energy
Christian Araguas	NRC	Diane Aiken	Dominion	Bill Boyle	Department of Energy
Jack Guttman	NRC	Jim Williams	Dominion	Corrine Macaluso	Department of Energy
John-Chau Nguyen	NRC	John Kessler	EPRI	Sylvia Saltzstein	Sandia National Laboratory
Jennifer Davis	NRC	Keith Waldrop	EPRI	Brady Hanson	Pacific Northwest National Laboratory
Chris Allen	NRC	Prakash Narayanan	Areva-TN	Carlyn Greene	UxC
Joe Borowsky	NRC	Adam Howell	Areva Federal Services	David Martin	Public Citizen
Kristina Banovac	NRC	Rod Gooch	Areva Federal Services	Erica Grey	Public Citizen
JoAnn Ireland	NRC	Don McGee	Areva Federal Services	Marvin Lewis	Public Citizen
Ricardo Torres	NRC	Gary Clark	Areva	Donna Gilmore	Public Citizen
Gina Davis	NRC	Dave Roberts	Areva	Ace Hoffman	Public Citizen
Huda Akhavannik	NRC	Armando Merlin	Areva		
David Tang	NRC	Robert Einziger	Nuclear Waste Technical Review Board		
Chris Jacobs	NRC	Rod McCullum	Nuclear Energy Institute		
Tim McCartin	NRC	Kristopher Cummings	Nuclear Energy Institute		
Tom Szymanski	Dominion	Terry Pickens	Xcel Energy		

## Meeting Agenda

Meeting with Dominion Virginia Power  
May 13, 2015

Purpose: Dominion Virginia Power to provide a status update on the high burn-up dry cask demonstration project proposed for North Anna Power Station. Topics for discussion will include both technical specifics and the projected licensing process for both the high burnup cask and the renewal of the specifically licensed ISFSI pad upon which it will be placed.

### Agenda:

1 P.M.-2 P.M

- High Burnup Dry Storage Cask
  - Project Status
  - License Amendment Request
  - Exemption Request (gas sampling)

2 P.M. - 2:45 PM

- License Renewal of SNM-2507 (expires 06/30/18)
  - Initial submittal
  - Supplement (high burnup cask)

2:45 P.M. – 3 P.M.

- Public Questions and Comments