

Attachments:

1. Supplemental Environmental Information
2. ANSYS Files and Proprietary Affidavit

Enclosed with this submittal is a CD which contains the Attachment 2 ANSYS Input Files requested, labeled:

Disk 1 of 1
ANSYS Input Files
Calculation 10494-174 R-0
Transnuclear Inc. Proprietary
Attachment to Dominion Letter 11-262A

The enclosed CD contains the following files:

File Number	File Name	Description	File Size	Sensitivity
1	DSC.cdw	Geometry for 32PTH DSC	140 MB	Proprietary
2	10494-174 Rev 0.doc	TN Calc. 10494-174, Rev. 0	270 KB	Proprietary
3	nDSChf.txt	DSC shell temp profile for off-normal conditions	1.48 MB	Proprietary
4	DSC-115-ReConf.db	ANSYS.db file	464 MB	Proprietary
5	Heatgen_reconf.mac	Heat generation macro w/ zone 1 at 0.86 kW	2 KB	Proprietary
6	DSC-115-ReConf.mntr	ANSYS.mntr file	1 KB	Proprietary
7	DSC-115-ReConf.osav	ANSYS.osav file	41 MB	Proprietary
8	MatInp.MAC	Material properties macro for 32PTH DSC	6 KB	Proprietary
9	DSC-115-ReConf.err	ANSYS.err file	2 KB	Proprietary
10	DSC-115-ReConf.inp	ANSYS.inp file	2 KB	Proprietary
11	DSC-115-ReConf.s01	ANSYS.s01 file	10.6 MB	Proprietary
12	DSC-115-ReConf.out	ANSYS.out file	2.5 MB	Proprietary
13	DSC-115-ReConf.rth	ANSYS.rth file	527 MB	Proprietary
14	eccp-ansys-job.txt	ANSYS job execution file	134 byte	Proprietary

Commitments made by this letter: None

cc: U. S. Nuclear Regulatory Commission*
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NRC Senior Resident Inspector*
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*w/o Attachment 2

Attachment 1

EXEMPTION REQUEST FOR NUHOMS® HD DRY SHIELDED CANISTERS
LOADED TO INCORRECT HEAT LOAD LIMITS
SUPPLEMENTAL ENVIRONMENTAL INFORMATION

NORTH ANNA POWER STATION – UNITS 1 AND 2
VIRGINIA ELECTRIC AND POWER COMPANY

Attachment 1

Supplemental Environmental Information

Description of the Proposed Action

In a letter dated July 21, 2011 (Serial Number 11-262), Virginia Electric and Power Company (Dominion) requested a one-time exemption from the requirements of 10 CFR 72.212(b)(3) and (b)(11) pursuant to 10 CFR 72.7, for Transnuclear, Inc. NUHOMS® HD Dry Shielded Canisters (DSC), Model Number HD-32PTH, with serial numbers DOM-32PTH-004-C, -005-C, -007-C, -010-C, -013-C, -019-C, and GBC-32PTH-011-C. The regulations require, in part, compliance to the terms and conditions of the Certificate of Compliance (CofC). Contrary to this requirement, these seven DSCs were not loaded in compliance with the decay heat limits in CofC Number 72-1030, Amendment 0 at the time of loading.

The 32PTH DSC is designed for zoned upper loading with respect to decay heat. The four center locations are divided into an upper Zone 1b and a lower Zone 1a, with the lower Zone 1a locations allowing a greater decay heat than the upper Zone 1b locations. The upper and lower orientation of the Zone 1b and 1a locations were reversed when preparing the DSC loading maps for the affected DSCs. As a result of this error, twelve fuel assemblies were placed in DSC locations where their decay heat at the time of loading slightly exceeded the functional and operational limits established by CofC 1030, Amendment 0 Technical Specification Section 2.1. The twelve fuel assemblies are distributed over the seven DSCs previously identified. As of March 24, 2011, the date of discovery, the decay heat for eleven of the twelve fuel assemblies had already decreased such that the decay heat limit as stated in the CofC 1030 Technical Specifications had been met. Fuel assembly 2B2 had a calculated decay heat of 0.807 kW on the date of discovery and was projected to meet the Technical Specification decay heat limit of 0.8 kW on July 31, 2011.

The decay heat of all fuel assemblies in the affected DSCs has decreased to within the CofC 1030 decay heat limit for those locations. However, loading fuel assemblies outside of location specific CofC 1030 decay heat limits is not allowed. Therefore, Dominion requested an exemption in order to document the acceptability and safety basis for allowing the affected DSCs to remain loaded in their current configuration.

Purpose of Environmental Assessment

The purpose of this assessment is to evaluate the environmental impact of the proposed exemption and the alternative. The information contained in this assessment is intended to aid the NRC staff in performing an environmental assessment.

Environmental Impacts of the Proposed Action

The North Anna Power Station (NAPS) Independent Spent Fuel Storage Installation (ISFSI) is a radiologically controlled, Protected Area (PA) with limited access and is located inside the NAPS Owner Controlled Area (OCA). The area considered for potential environmental impact as a result of this exemption request is the area in and surrounding the ISFSI.

As described in the exemption request, Transnuclear, Inc. has performed a thermal analysis that conservatively bounds the as-loaded configurations of the affected DSCs. The analysis concluded that fuel cladding temperatures for the as-loaded 32PTH DSCs were below the fuel cladding temperature limit of 752°F for storage and transfer conditions at the time of loading. The analysis also concluded the DSC fuel compartment and support rail temperatures were bounded by those used in the design basis analysis, indicating there was no detrimental impact on the design basis structural evaluation of the DSC basket. Furthermore, the DSC internal pressure remained below the design limit, the design basis shielding analysis remained bounding, and the reactivity parameters of the fuel assemblies were not affected. The analysis concluded that the integrity of the DSC and its ability to perform its intended design functions was not compromised due to the mis-load.

The interaction of the DSC with the environment is through the shielding, confinement, and thermal design functions. The shielding design function will continue to limit external dose to levels bounded by the NUHOMS® HD Final Safety Analysis Report (FSAR). The thermal analysis showed that the confinement design functions of the fuel cladding and the DSC structure were not adversely impacted by the as-loaded configurations. Therefore, it can be concluded that all DSC design functions impacting interaction with the environment were unaffected during the time that the as-loaded DSCs did not comply with the CofC 1030 decay heat limits, and were bounded by the NUHOMS® HD FSAR evaluations.

Because all fuel assemblies in the affected DSCs met the Technical Specification decay heat limit as of July 31, 2011, it can also be concluded that all DSC design functions impacting interaction with the environment are, and will continue to be, bounded by the NUHOMS® HD FSAR evaluations.

Dominion concludes that there are no gaseous, liquid or solid effluents (radiological or non-radiological), radiological exposures (worker or member of the public) or land disturbances associated with the proposed action.

Therefore, approval of the requested exemption to allow the canisters to remain as loaded has no impact on the environment.

Adverse Environmental Effects Which Cannot be Avoided Should the Exemption be Approved

As noted previously, there are no environmental impacts associated with approval of this exemption. Therefore, there are no adverse environmental effects which cannot be avoided should the exemption request be approved.

Alternative to the Proposed Action

An alternative to the proposed exemption would be to correct the condition by reloading the affected DSCs in compliance with the CofC 1030 decay heat limits. This would involve the following steps:

- Retrieve each affected DSC from its respective Horizontal Storage Module (HSM) and transfer back to the spent fuel pool.
- Perform necessary procedures to machine off the outer lid and inner shield plug, and open the DSC.
- Unload all fuel assemblies to the spent fuel pool.
- Inspect top shield plug, outer lid, and DSC for damage incurred during the machining process.
- Inspect DSC basket and repair/replace damaged components as necessary.
- Replace the used DSC with a new DSC (if DSC is unable to be reused).
- Reload fuel assemblies into the DSC such that the decay heat for all assemblies meets the CofC 1030 decay heat limits.
- Perform necessary procedures to close and vacuum dry the DSC.
- Transfer the DSC back to the ISFSI and re-insert into the HSM.

This alternative would restore the affected DSCs to compliance with CofC 1030.

Environmental Impacts of the Alternatives to the Proposed Action

In addition to other undesirable impacts as described in the analysis section below, environmental impacts of the alternative to the proposed action would include both real and potential radiological impacts. These would include the generation of additional radiologically contaminated material during the unloading and loading processes, an increase in personnel exposure during all phases of the unloading and loading processes, and additional opportunities for design basis accidents such as a fuel handling or cask drop event. None of the real or potential environmental impacts associated with the alternative action would be incurred for the proposed action.

Analysis

Dominion's request for exemption from 10 CFR 72.212(b)(3) and 10 CFR 72.212(b)(11) has no adverse impact to the environment. Approval of the exemption request would allow maintaining the DSCs in their current state. This action is supported by the Transnuclear, Inc. analysis referenced in the exemption request, which verified the as-loaded canisters have continued to perform all design functions and meet all FSAR design limits from the time of initial loading. The analysis also showed that the non-conforming decay heat values did not result in any structural damage to the DSC which would degrade the design functions for current and future operation. Therefore, because the decay heat of all affected assemblies now meets the CofC 1030 decay heat limits and the design function has been shown to not have been adversely affected, there is no technical reason to require unloading and reloading the affected DSCs as described in the alternative to the proposed action. The proposed action would not result in adverse impact to the environment, additional expenditures, or other uncertainties or risks associated with the alternative to the proposed action as discussed below.

An alternative to the proposed exemption would be to correct the condition by unloading and reloading the affected DSCs in compliance with the CofC 1030 decay heat limits. The general steps that would be performed to complete the unloading and reloading processes were discussed previously. These steps would introduce additional opportunities for design basis accidents such as a fuel handling or cask drop event, which could increase the risk of an environmental impact due to the release of radioactive material. These steps would also increase the amount of radiologically contaminated material generated due to additional unloading and loading operations. This includes the used DSC, which would have to be disposed of properly. Additional DSC unloading and loading would increase personnel radiation exposure by an estimated 250 mRem per affected DSC. This estimate is based on Dominion's previous experience for personnel exposure during all phases of the loading process.

The alternative to the proposed exemption would also result in considerable costs to Dominion and its rate payers. The "per DSC" costs include an estimated \$150,000 dollars for unloading, \$150,000 dollars for reloading, \$1,000,000 dollars for the purchase of a new DSC, and \$200,000 dollars to dispose of the old DSC. These costs are estimates based on Dominion's past DSC procurements and labor rates associated with loading processes.

Past operating experience at another power plant describes an event in which the top shield plug of a loaded 32P DSC had to be removed via a machining process due to a misalignment. Because neither the top shield plug nor the DSC shell were damaged during the machining process, the existing top shield plug was able to be welded back into place.

It is possible that the affected DSCs could be reused if no damage is incurred as a result of the alternative action. Damaged components would be evaluated and replaced if necessary. Because of the uncertainty in this process and the lack of previous experience in unloading DSCs, the Dominion cost estimate assumes all affected DSCs will require replacement.

As a result of this environmental assessment, Dominion concludes that the proposed action, which will allow maintaining the affected DSCs in their current storage configuration, is in the public interest in that it avoids the adverse environmental, radiological and financial effects associated with the alternative to the proposed action.

Status of Compliance

Neither the proposed action as described in this environmental assessment nor the alternative to the proposed action require any additional Federal permits, licenses, approvals, or other entitlements.

Attachment 2

EXEMPTION REQUEST FOR NUHOMS® HD DRY SHIELDED CANISTERS
LOADED TO INCORRECT HEAT LOAD LIMITS
TRANSNUCLEAR, INC. CALCULATION NO. 10494-174
ANSYS FILES AND PROPRIETARY AFFIDAVIT

NORTH ANNA POWER STATION – UNITS 1 AND 2
VIRGINIA ELECTRIC AND POWER COMPANY

On July 21, 2011, Dominion submitted an exemption request to the NRC for NUHOMS® Dry Shielded Canisters (DSC) loaded to incorrect heat load limits at North Anna Power Station (Serial No. 11-262). Included in that submittal were Transnuclear, Inc. (TN) Calculation 10494-174, "Effect of the Reversed Loading Patterns on the Thermal Performance of 32PTH DSC", and a TN affidavit requesting withholding of the calculation from public disclosure on the basis that the calculation is proprietary.

Please find included a compact disk with the ANSYS files required to run the thermal analyses presented in TN Calculation 10494-174. As TN considers the ANSYS files part of the original calculation, the proprietary status requested for the calculation extends to the ANSYS files supplied as supplemental information. A copy of the original affidavit for TN Calculation 10494-174 remains bounding and is attached.



Mr. Cary Laroe
Supervisor, Nuclear Engineering
Dominion, Nuclear Analysis and Fuel
500 Dominion Blvd
Glen Allen, VA 23060

E-31109
TN Project 10494
June 21, 2011

Subject: Affidavit for TN Calculation 10494-174

Reference:

1. Dominion Master Services Agreement: 46017934
2. Dominion Release No.: 7010848
3. TN Calculation 10494-174

Attachments: Affidavit Pursuant to 10 CFR 2.390

Dear Mr. Laroe

Please find attached an Affidavit concerning the proprietary nature of TN Calculation 10494-174 (Ref 3). TN recognizes that Dominion Resources will be using Ref 3 as an appendix to the following exemption letter:

For Surry:

Letter Serial No. 11-251

Virginia Electric and Power Company

Surry Power Station Units 1 and 2

Exemption Request for NUHOMS[®] HD Dry Shielded Canisters Loaded to Incorrect Heat Load Limits

For North Anna:

Letter Serial No. 11-262

Virginia Electric and Power Company

North Anna Power Station Units 1 and 2

Exemption Request for NUHOMS[®] HD Dry Shielded Canisters Loaded to Incorrect Heat Load Limits

Please attach the affidavit to the cover of the calculation (Ref 3) whenever submitting the document to the NRC as part of the aforementioned letter(s). Reference 3 is intended for Dominion use and is not intended for public dissemination.

If you have any questions, please feel free to contact me at (410) 910-6949 or Ken.Boone@AREVA.com.

Best Regards,

A handwritten signature in cursive script that reads 'Ken Boone'.

Kenneth R. Boone

Sr. Project Manger

Cc: R. Robins

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**AFFIDAVIT PURSUANT
TO 10 CFR 2.390**

Transnuclear, Inc.
State of Maryland
County of Howard

I, Jayant Bondre, depose and say that I am a Vice President of Transnuclear, Inc., duly authorized to execute this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.390 of the Commission's regulations for withholding this information.

The information for which proprietary treatment is sought is listed below:

TN Calculation 10494-174 Rev 0: Effect of Reversed Loading Patterns on the thermal Performance of 32PTH DSC.

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Transnuclear, Inc. in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

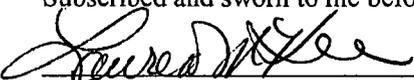
- 1) The information sought to be withheld from public disclosure involves details and analyses related to Transnuclear, Inc.'s design for the NUHOMS® 32PTH Dry Shielded Canister, which are owned and have been held in confidence by Transnuclear, Inc.
- 2) The information is of a type customarily held in confidence by Transnuclear, Inc. and not customarily disclosed to the public. Transnuclear, Inc. has a rational basis for determining the types of information customarily held in confidence by it.
- 3) Public disclosure of the information is likely to cause substantial harm to the competitive position of Transnuclear, Inc. because the information consists of details and analyses related to Transnuclear, Inc.'s design for the NUHOMS® 32PTH Dry Shielded Canister, the application of which provide a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Transnuclear, Inc., take marketing or other actions to improve their product's position or impair the position of Transnuclear, Inc.'s product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

Further the deponent sayeth not.



Jayant Bondre
Vice President, Transnuclear, Inc.

Subscribed and sworn to me before this 21th day of June, 2011.



Notary Public

My Commission Expires
Lauren McKee
NOTARY PUBLIC
Arne Arundel County, Maryland
My Commission Expires 2/12/2015

