

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

~~PROPRIETARY INFORMATION WITHOLD UNDER 10 CFR 2.390~~

June 21, 2016

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Director, Division of Spent Fuel Management  
Office of Nuclear Material Safety and Safeguards  
Washington, DC 20555-0001

Serial No. 16-055B  
NLOS/TJS R0  
Docket No. 72-16  
License No. SNM-2507

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION INDEPENDENT SPENT FUEL STORAGE**  
**INSTALLATION**  
**PROPOSED TECHNICAL SPECIFICATION CHANGE REQUEST REGARDING**  
**STORAGE OF INCREASED MAXIMUM ENRICHMENT AND BURN-UP FUEL IN A**  
**MODIFIED TN-32B STORAGE CASK**  
**SUPPLEMENTAL INFORMATION**

On August 24, 2015, Virginia Electric and Power Company (Dominion) requested an amendment (ADAMS Accession No. ML15239B251) in the form of revisions to the Technical Specifications to License Number SNM-2507 for the North Anna Power Station (NAPS) Independent Spent Fuel Storage Installation (ISFSI). The proposed amendment would allow storage of spent fuel in a modified TN-32B bolted lid cask as part of the High Burn-up (HBU) Dry Storage Cask Research and Development Project sponsored by the Department of Energy (DOE) and the Electric Power Research Institute (EPRI). This initial submittal was subsequently supplemented several times (see References) in response to NRC requests for supporting information.

On January 15, 2016, Dominion received a Request for Additional Information (RAI) (ADAMS Accession Nos. ML 16019A206 / letter, ML 16019A209 / enclosure) pertaining to the High Burn-up Dry Cask Research and Development Project. On March 22, 2016, Dominion responded to the RAI (ADAMS Accession No. ML 16089A092), and subsequently furnished additional proprietary information (ADAMS Accession No. ML16118A206).

On May 26, 2016, during a teleconference with the NRC, Project Manager Mr. William Allen requested the submittal of several calculations and a design criteria matrix to support the NRC's review of the HBU cask project submittals outlined above. The requested calculations are provided in Attachment 1. Attachment 1 contains information that has been determined by AREVA/TN to be proprietary in its entirety, therefore a non-proprietary version of these documents has not been provided. AREVA/TN is requesting that Attachment 1 be withheld from public disclosure in accordance with 10 CFR 2.390, as the calculations are proprietary. In support of the request to withhold Attachment 1, an affidavit has been prepared by AREVA/TN and is provided as Attachment 2.

**~~ATTACHMENT 1 CONTAINS INFORMATION THAT IS BEING WITHHELD FROM~~**  
**~~PUBLIC DISCLOSURE UNDER 10 CFR 2.390. UPON SEPARATION THIS LETTER~~**  
**IS DECONTROLLED.**

NMSS 20  
NMSS 26



6. Dominion Letter No. 15-369G, dated 12/28/15 (Proprietary)
7. Dominion Letter No. 15-369H, dated 01/14/16 (ADAMS Accession No. ML 16019A335)
8. Dominion Letter No. 15-369I, dated 02/04/16 (ADAMS Accession No. ML 16043A371)

Attachments:

1. Additional Requested Calculations Related to HBU Cask (Proprietary)
2. AREVA/TN Affidavit
3. TSAR / UFSAR Matrix for TN-32B HBU Demonstration Cask

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission (w/o Attachments)  
Region II  
Marquis One Tower  
245 Peachtree Center Avenue, NE Suite 1200  
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector (w/o Attachments)  
North Anna Power Station

Mr. William Allen  
Senior Project Manager  
U. S. Nuclear Regulatory Commission  
Two White Flint North, Mail Stop 4 B34  
11545 Rockville Pike  
Rockville, Maryland 20852-2738

Mr. J. E. Reasor, Jr. (w/o Attachments)  
Old Dominion Electric Cooperative  
Innsbrook Corporate Center, Suite 300  
4201 Dominion Blvd.  
Glen Allen, Virginia 23060

State Health Commissioner (w/o Attachments)  
Virginia Department of Health  
James Madison Building – 7<sup>th</sup> Floor  
109 Governor Street, Room 730  
Richmond, Virginia 23219

**ATTACHMENT 1**

**Additional Requested Calculations Related to HBU Cask (Proprietary)**

Attachment 1 provides the following specific documents:

- AREVA/TN Calculation 1066-33, Rev. 0
- AREVA/TN Calculation 1086-02, Rev. 0
- AREVA/TN Calculation 19885-0403, Rev. 2
- AREVA/TN Calculation 19885-0409, Rev. 1

**North Anna Power Station ISFSI**

**Virginia Electric and Power Company**

**ATTACHMENT 1 CONTAINS INFORMATION THAT IS BEING WITHHELD FROM  
~~PUBLIC DISCLOSURE UNDER 10 CFR 2.390.~~ UPON SEPARATION THIS PAGE IS  
DECONTROLLED.**

Serial No. 16-055B  
Docket No. 72-16

**ATTACHMENT 2**

AREVA/TN Affidavit

**North Anna Power Station ISFSI  
Virginia Electric and Power Company**



June 6, 2016  
E-45317 Rev. 0

Don McGee, PM  
Mail Code CLT-1D  
7207 IBM Dr.  
Charlotte, NC 28262

**Subject: NRC Request for Additional Design Documents Supporting License Amendment Request  
Serial No. 15-369 to License SNM-2507 Docket No. 72-16**

Dear Mr. McGee:

This correspondence is written to provide AREVA TN response to a request by the NRC to receive copies of select design documents that support the subject License Amendment Request (LAR). This LAR is for the storage of high burn up (HBU) nuclear fuel at the North Anna Power Station as part of a project to monitor the effects of long-term storage. The documents requested are being transmitted to Dominion Power under proprietary agreement and, subsequently, forwarded on to the NRC via an affidavit pursuant to 10 CFR 2.390.

The specific proprietary calculations to be transmitted are identified as follows:

- 1066-33 Rev. 0, Soluble Boron Criticality Benchmarks
- 1086-02 Rev. 0, TN-32 Upper Trunnions and Bijlaard Analysis for WEPCO
- 19885-0403 Rev. 2, Thermal Evaluation of TN-32B HBU Cask for Normal and Accident Conditions
- 19885-0409 Rev. 1, Grid Convergence Study of TN-32B HBU Cask ANYSY Model for Normal Conditions of Storage

Sincerely,

A handwritten signature in cursive script that reads 'T. M. Edwards'.

Tom Edwards  
Design Project Engineer

cc: Phil Lozmack (PM)                      Rod Gooch (PM)  
      Todd Young (QAS)                     John McEntire (PM)  
      Dennis Williford (Licensing)        Phil Lozmack (PM)  
      Don Shaw (Licensing)                Project File 19885 – Outgoing Correspondence  
      Lauren Naggs (DCA)

**AREVA TN**

**AFFIDAVIT PURSUANT  
TO 10 CFR 2.390**

AREVA Inc. )  
State of Maryland ) SS.  
County of Howard )

I, Jayant Bondre, depose and say that I am a Vice President of AREVA 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:

- Calculation 1066-33, Revision 0
- Calculation 1086-02, Revision 0
- Calculation 19885-0403, Revision 2
- Calculation 19885-0409, Revision 1

These documents have been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by AREVA 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 documents (design analyses) related to the design of the modified TN-32B dry storage cask (High Burnup Fuel Cask Demonstration Project), which are owned and have been held in confidence by AREVA Inc.
- 2) The information is of a type customarily held in confidence by AREVA Inc. and not customarily disclosed to the public. AREVA 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 AREVA Inc. because the information consists of descriptions of the design and analysis of the modified TN-32B dry spent fuel storage cask, 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 AREVA Inc., take marketing or other actions to improve their product's position or impair the position of AREVA 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, Chief Technical Officer, AREVA Inc.

Subscribed and sworn before me this 7th day of June, 2016.

  
Notary Public  
My Commission Expires 10/16/19

**RONDA JONES**  
NOTARY PUBLIC STATE OF MARYLAND  
My Commission Expires October 16, 2019

**ATTACHMENT 3**

**TSAR / UFSAR Matrix for TN-32B HBU Demonstration Cask**

**North Anna Power Station ISFSI  
Virginia Electric and Power Company**





June 10, 2016

E-45494 Rev. 0

Don McGee, PM  
Mail Code CLT-1D  
7207 IBM Dr.  
Charlotte, NC 28262

**Subject:** TSAR/UFSAR Matrix for TN-32B HBU Demonstration Cask

Dear Mr. McGee:

This correspondence is written to provide the subject matrix to Dominion Power for transmittal to the NRC. This matrix was requested by the NRC to differentiate requirements for the High Burnup Demonstration Cask derived from the original TN-32 TSAR versus the requirements noted in design documentation that references various revisions of the CoC 1021 ISFSI UFSAR.

This matrix also contains three columns that provide a comparison to the design criteria applicable to the TN-32B demonstration cask: one column for the specific design criteria value; one column for a reference to the Design Criteria Document (DCD); and the last column for reference to the Design Licensing Basis Document (DLBD) as applicable for these references.

The matrix is the product of a prepared and independently checked document that lends itself to being used as a reliable source for key design and licensing information. The names and signatures below identify the AREVA TN personnel who prepared and checked the document.

If you or anyone at Dominion Power have questions on information contained herein, please contact me, Tom Edwards, and I will strive to resolve the issue as soon as possible.

Sincerely,

Prepared by:

Handwritten signature of Tom Edwards in black ink.

Tom Edwards  
Design Project Engineer

Checked by:

Handwritten signature of Karan Mauskar in black ink.

Karan Mauskar  
Design Project Engineering Manager

Attachment (1) TSAR/UFSAR Matrix for HBU Demo Cask

cc: Phil Lozmack (PM)                      Rod Gooch (PM)  
      Todd Young (QAS)                     John McEntire (PM)  
      Lauren Naggs (DCA)                 Brian Vitiello (Dominion Power)  
      Dennis Williford (Licensing)      Project File 19885 – Outgoing Correspondence  
      Tom Brookmire (Dominion Power)

AREVA TN

---

AREVA Inc.  
7135 Minstrel Way - Suite 300 - Columbia, MD 21045 USA  
Tel.: (410) 910-6900 - Fax: (410) 910-6902  
us.aveva.com/AREVATN

TSAR/UFSAR Matrix for HBU Demo Cask

Design Criteria	TSAR Rev. 9A	TN-32 UFSAR R-2	TN-32 UFSAR R-3	TN-32 UFSAR R-6	TN-32B Design <sup>(1)(2)</sup>	DCD 19885-0101	DLBD E-42038
Gross Weight	120 tons <sup>(3)</sup>	120 tons <sup>(3)</sup>	120 tons <sup>(3)</sup>	120 tons <sup>(3)</sup>	124.45 tons <sup>(4)</sup>	4.1	1.1
Max. Cask Height	193 in.	179.5 in.	179.5 in.	179.5 in.	179.5 in.	19885-70-1	19885-70-1
Min. Design Life	25 yrs	40 yrs	40 yrs	40 yrs	40 yrs	SNM-2507 LAR	SNM-2507 LAR
Max. Keff							
normal	< 0.95	< 0.95	< 0.95	< 0.95	< 0.95	4.5.1	
accident	≤ 0.95	< 0.95	< 0.95	< 0.95	< 0.95	4.5.1	
Payload Capacity							
# of FAs	32	32 <sup>(5)</sup>	32 <sup>(5)</sup>	32 <sup>(5)</sup>	32 <sup>(6)</sup>	4.1	1.2
total wt. (max)	1533 lbs	1533 lbs	1533 lbs	1533 lbs	1551 lbs	4.1.1	
Max. External Dose	200 mR/hr	N/A	N/A	N/A	N/A		
Initial Enrichment	3.85%	4.05%	4.05%	4.05%	4.55%	4.1	1.2
Max. Burnup	40 GWD/MTU	45 GWD/MTU	45 GWD/MTU	45 GWD/MTU	60 GWD/MTU	1.0	1.2
Min. Cooling Time	7 yrs	7 yrs	7 yrs	7 yrs	5.31 yrs		1.2
Decay Heat	27 kW	32.7 kW	32.7 kW	32.7 kW	36.96 kW		1.2
Max. Cladding Temp.	348° C	328° C	328° C	328° C	400° C	4.3.1	3.1
Cask Cavity Atmosphere	Helium	Helium	Helium	Helium	Helium	5.0	1.3
Max. Internal Pressure	100 psig	100 psig	100 psig	100 psig	100 psig	4.2.1.8	2.1.1
Ambient Temp.							
min.	neg 20° F	neg 30° F	neg 30° F	neg 30° F	neg 20° F	4.2.1.8	3.1
max.	115° F	115° F	115° F	115° F	115° F	4.2.1.8	
Ambient Temp (24 yr avg)							
min.	N/A	neg 20° F	neg 20° F	neg 20° F	neg 20° F	4.2.1.8	3.1
max.	N/A	100° F	100° F	100° F	100° F	4.2.1.8	3.1
Flat Surface Solar Ht. Load (max)	2950 Btu/ft <sup>2</sup>	2950 Btu/ft <sup>2</sup>	2950 Btu/ft <sup>2</sup>	2950 Btu/ft <sup>2</sup>	2950 Btu/ft <sup>2</sup>	4.2.1.1	
Curved Surface Solar Ht. Load (max)	1474 Btu/ft <sup>2</sup>	1474 Btu/ft <sup>2</sup>	1474 Btu/ft <sup>2</sup>	1474 Btu/ft <sup>2</sup>	1474 Btu/ft <sup>2</sup>	4.2.1.1	
Tornado Wind Speed							
rotational	290 mph	290 mph	290 mph	290 mph	360 mph	4.2.1.3	
translational	70 mph	70 mph	70 mph	70 mph	80 mph	4.2.1.3	
Tornado Missiles							
automobile	1800 kg; 126 mph	1800 kg; 126 mph	1800 kg; 126 mph	1800 kg; 126 mph	2000 lbs; 150 mph	4.2.1.3	
armor piercing shell	125 kg; 8" thk; 126 mph	125 kg; 8" thk; 126 mph	125 kg; 8" thk; 126 mph	125 kg; 8" thk; 126 mph	N/A		
solid steel sphere	1" dia; 126 mph	1" dia; 126 mph	1" dia; 126 mph	1" dia; 126 mph	N/A		
wood utility pole	N/A	N/A	N/A	N/A	12" dia; 40 ft lg; 150 mph	4.2.1.3	
steel rod	N/A	N/A	N/A	N/A	1" dia; 3 ft lg; 200 mph	4.2.1.3	
steel pipe	N/A	N/A	N/A	N/A	6" Sch 40; 15 ft lg; 200 mph	4.2.1.3	
steel pipe	N/A	N/A	N/A	N/A	12" Sch 40; 15 ft lg; 200 mph	4.2.1.3	
Cask Drop	18"; 60"; 50 g	18"; 60"; 50 g	18"; 60"; 50 g	18"; 60"; 50 g	18"; 50 g	4.2.3	
Cask Tip	Onto ISFSI pad (50 g)	Onto ISFSI pad (50 g)	Onto ISFSI pad (50 g)	Onto ISFSI pad (50 g)	Onto ISFSI pad (50 g)		2.1.2
Seismic							
horiz (N-S)	0.12 g	0.26 g	0.26 g	0.26 g	0.55 g	4.2.1.5	
horiz (E-W)	0.12 g	0.26 g	0.26 g	0.26 g	0.398 g	4.2.1.5	
vert	0.08 g	0.17 g	0.17 g	0.17 g	0.38 g	4.2.1.5	
Snow/Ice Load	50 lb/ft <sup>2</sup>	50 lb/ft <sup>2</sup>	50 lb/ft <sup>2</sup>	50 lb/ft <sup>2</sup>	N/A	4.2.1.6	

NOTE:

- (1) TN-32 Design Criteria are listed in Table 2.5-1 of the TN-32 ISFSI UFSAR (CoC 1021). There has been no change in this table from Rev. 1 to Rev. 6 of this UFSAR.
- (2) The TN-32B demonstration cask was originally designed under UFSAR Rev. 2; source of licensing/design differences are shown in DCD and DLBD columns.
- (3) Excludes wt. of water on a 125 ton hook.
- (4) This value is an as-built value including wt. of water on a 125 ton hook.
- (5) Fuel types intact West. 14x14, 14x14 O.F.A., 15x15, 17x17, 17x17 O.F.A.; or B&W 17x17 Mark BW (with or without BPRAs or TPAs).
- (6) For fuel types West. LOPAR; NAI 17x17; AREVA MK-BW 17x17.