

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

Attachment 3 contains the requested TSAR (Technical Safety Analysis Report) / UFSAR (Updated Final Safety Analysis Report) Matrix for the TN-32B HBU Demonstration Cask.

If you have any questions or require additional information, please contact Mr. Thomas Szymanski at (804) 273-3065.

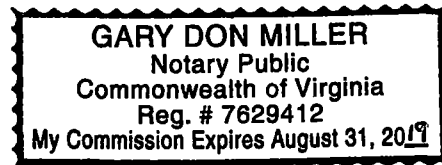
Sincerely,



Mark D. Sartain
Vice President – Nuclear Engineering

COMMONWEALTH OF VIRGINIA)

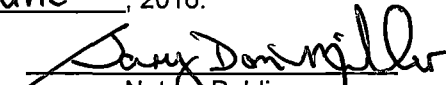
COUNTY OF HENRICO)



The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain, who is Vice President – Nuclear Engineering, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 21st day of June, 2016.

My Commission Expires: August 31, 2019


Notary Public

References:

1. Dominion Letter No. 15-369A, dated 10/08/15 (ADAMS Accession No. ML 15289A189)
2. Dominion Letter No. 15-369C, dated 11/18/15 (ADAMS Accession No. ML 15328A483)
3. Dominion Letter No. 15-369D, dated 11/19/15 (ADAMS Accession No. ML 15331A132)
4. Dominion Letter No. 15-369E, dated 12/01/15 (ADAMS Accession No. ML 15342A065)
5. Dominion Letter No. 15-369F, dated 11/19/15 (ADAMS Accession No. ML 16022A073)

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

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 – 7th 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)	

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Page 1 of 1

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:

A handwritten signature in cursive script, appearing to read 'T.M. Edwards'.

Tom Edwards
Design Project Engineer

Checked by:

A handwritten signature in cursive script, appearing to read 'K. Mauskar'.

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

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 ⁽¹⁾⁽²⁾	DCD 19885-0101	DLBD E-42038
Gross Weight	120 tons ⁽³⁾	120 tons ⁽³⁾	120 tons ⁽³⁾	120 tons ⁽³⁾	124.45 tons ⁽⁴⁾	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 ⁽⁵⁾	32 ⁽⁵⁾	32 ⁽⁵⁾	32 ⁽⁶⁾	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 ²	2950 Btu/ft ²	2950 Btu/ft ²	2950 Btu/ft ²	2950 Btu/ft ²	4.2.1.1	
Curved Surface Solar Ht. Load (max)	1474 Btu/ft ²	1474 Btu/ft ²	1474 Btu/ft ²	1474 Btu/ft ²	1474 Btu/ft ²	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 ²	50 lb/ft ²	50 lb/ft ²	50 lb/ft ²	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; NAIF 17x17; AREVA MK-BW 17x17.