

June 23, 2014

Mr. George H. Gellrich
Vice President
Calvert Cliffs Nuclear Power Plant, LLC
1650 Calvert Cliffs Parkway
Lusby, MD 20657

SUBJECT: AMENDMENT REQUEST NO. 11 TO MATERIALS LICENSE NO. SNM-2505
FOR THE CALVERT CLIFFS SPECIFIC INDEPENDENT SPENT FUEL
STORAGE INSTALLATION – ACCEPTANCE REVIEW – REQUEST FOR
SUPPLEMENTAL INFORMATION (TAC NO. L24912)

Dear Mr. Gellrich:

By letter dated March 26, 2014, Calvert Cliffs Nuclear Power Plant (CCNPP), LLC, submitted license amendment request (LAR) No. 11 to the U.S. Nuclear Regulatory Commission (NRC) for Materials License No. SNM-2505 (LAR 2505-11) for the CCNPP specific independent spent fuel storage installation (ISFSI). The amendment, if approved, would authorize the storage of Westinghouse and Areva Combustion Engineering (CE) 14X14 fuel in the NUHOMS® 32PHB Dry Shielded Canister system.

The NRC staff (staff) performed an acceptance review of your application to determine if the application contained sufficient technical information in scope and depth to allow the staff to complete the detailed technical review. The staff has reviewed your application and concluded that it does not provide technical information in sufficient detail to enable the staff to complete its detailed review and make an independent assessment regarding the acceptability of the proposed amendments in terms of regulatory requirements, and the protection of public health and safety, and the environment. Enclosed are the staff's requests for supplemental information (RSI). Additionally, the staff included an observation that may be asked at a later date. The response to the observation is not required for the staff to begin a detailed technical review. Providing this information at your earliest convenience would facilitate the staff evaluation. Observations are not the result of a detailed technical review and may be resolved once the staff begins a detailed review.

These were discussed with Mr. Ken Greene of your staff in a June 4, 2014, conference call. Please provide your responses by July 25, 2014, or contact the NRC no later than July 11, 2014, to request an extension.

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G. Gellrich

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If you have any questions, please contact me at (301) 287-9250.

Sincerely,

/RA/

John M. Goshen, P.E., Project Manager
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No.: 72-8

TAC No.: L24912

Enclosure: As stated

cc: CCNPP Service List

If you have any questions, please contact me at (301) 287-9250.

Sincerely,

/RA/

John M. Goshen, P.E., Project Manager
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Enclosure: As stated

cc: CCNPP Service List

ADAMS: ML14176A128

File location: G:\SFST\Calvert Cliffs ISFSI\Amend 11\Acceptance Review\CC LAR 11 RSIs
.docx

OFC:	SFST	SFST	SFST	SFST	SFST	SFST
NAME:	JGoshen	WWheatley	DTarantino	JIreland	NJordan	JBorowsky
DATE:	5/27/2014	6/6 /2014	6/11/2014	6/ 6 /2014	6/17/2014	613 /2014
OFC:	SFST	SFST	SFST	SFST	SFST	SFST
NAME:	SEverard	ASotamayor-Rivera	CAraguas	ZLi for MRahimi	ACsontos	JDavis
DATE:	6/ 6 /2014	6/11/2014	6/13 /2014	6/17/2014	6/19/2014	6/23/2014

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CALVERT CLIFFS INDEPENDENT SPENT FUEL STORAGE INSTALLATION

MATERIALS LICENSE NO. SNM-2505

DOCKET NO. 72-8

LICENSE AMENDMENT REQUEST NO. 11

REQUEST FOR SUPPLEMENTAL INFORMATION

By letter dated March 26, 2014, Calvert Cliffs Nuclear Power Plant (CCNPP), LLC, submitted license amendment request (LAR) No. 11 to the U.S. Nuclear Regulatory Commission (NRC) for Materials License No. SNM-2505 (LAR 2505-11) for the CCNPP specific independent spent fuel storage installation (ISFSI). The amendment, if approved, would authorize the storage of Westinghouse and Areva Combustion Engineering (CE) 14X14 fuel in the NUHOMS® 32PHB Dry Shielded Canister system.

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RSI

Chapter 5 Structural Evaluation

5-1 Provide the List of Effective Pages (LOEP) and all revision pages for Revision 22 to the Calvert Cliffs ISFSI Updated Safety Analysis Report.

The staff notes that Section 13.0 of the Calvert Cliffs ISFSI USAR, Revision 22 Draft A is not the entire revision. Section 13.0 states that "Chapter 1 is revised to include information for the NUHOMS-24P, NUHOMS-32P and the NUHOMS 32PHB DSCs." Based on Amendment No. 6, there should be changes to Chapters 1-11 as a result of the addition of the NUHOMS-32PHB; therefore, the entire revision is needed for evaluation.

This information is needed to demonstrate compliance with 10 CFR 72.24.

5-2 Provide a one-to-one mapping of the elements of the NUHOMS-24P, -32P, and -32PTH DSCs (including basket and fuel) to those of the NUHOMS-32PHB DSC that are being cited in lieu of analysis along with the justification and the section of the applicable USAR, FSAR, TSAR, and CoC with revision, as appropriate.

Enclosure

The staff notes that there are similarities between the proposed NUHOMS-32PHB and previous models associated with Calvert Cliffs Nuclear Power Plant, CoC-1004, and CoC-1030. It is unclear how the licensee is comparing the proposed design with those of previously approved models. For example, Section 2.0 of Attachment (1) compares the NUHOMS-32PHB to the HUNOMS-32P and lists several design differences. The Comparison Matrix of Enclosure (1) shows that the cladding material is Zircaloy-4 for the NUHOMS-32P and M5 for the NUHOMS-32PHB and the NUHOMS-32PTH, leaving the impression that the licensee intends to use the NUHOMS-32PTH as the basis for the structural analysis of the cladding for the NUHOMS-32PHB.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 5-3 Provide a one-to-one mapping of the elements of the CCNPP HSM, HSM-H and the NUHOMS-HD to those of CCNPP HSM-HB that are being cited in lieu of analysis along with the justification and the section of the applicable USAR, FSAR, TSAR, and CoC with revision, as appropriate.

The staff notes that there are similarities between the proposed CCNPP HSM-HB and previous models associated with Calvert Cliffs Nuclear Power Plant, CoC-1004, and CoC-1030. It is unclear how the licensee is comparing the proposed design with those of previously approved models. For example, Section 2.0 of Attachment (1) compares the HSM-HB module to the HSM modules used to house the NUHOMS-24P and -32P and lists several design differences. The Comparison Matrix of Enclosure (1) lists dissimilar design parameters for Tornado Missile loading for the HSM-HB and the HSM modules. Similar design parameters are listed for the HSM-HB, HSM-H and HSM-HD modules, indicating that the licensee intends to use either the HSM-H or HSM-HD modules as the basis for the Tornado Missile loading analysis for the HSM-HD module.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 5-4 Provide a one-to-one mapping of the elements of the CCNPP TC and the NUHOMS OS197FC TC to those of CCNPP FC-TC that are being cited in lieu of analysis along with the justification and the section of the applicable USAR, FSAR, TSAR and CoC with revision, as appropriate.

The staff notes that there are similarities between the proposed CCNPP FC-TC and previous models associated with Calvert Cliffs Nuclear Power Plant, CoC-1004 and CoC-1030. It is unclear how the licensee is comparing the proposed design with those of previously approved models. For example, Attachment (1) states that the same transfer cask is used for the NUHOMS-32PHB, -24P and -32P DSCs, but the forced-cooling configuration will be used when handling the NUHOMS-32PHB. The Comparison Matrix of Enclosure (1) lists dissimilar design parameters for Tornado Missile loading for the CCNPP FC-TC and the CCNPP TC. Similar design parameters are listed for the CCNPP FC-TC and the OS197FC TC (NUHOMS-32PTH DSC), indicating that the licensee intends to use the OS197FC TC as the basis for the Tornado Missile loading analysis for the CCNPP FC-TC.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 5-5 Provide the structural calculations (-02XX) referenced in Section 13.13 of Enclosure 2 of Attachment (1), Draft USAR Chapter for NUHOMS-32PHB DSC.

These references are for the NUHOMS-32PHB, the associated HSM-HB and the transfer cask in forced circulation and are required to conduct a review of the amendment request.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 5-6 Provide the safety analysis for the ISFSI pad(s) expanding the previously analyzed total allowable deployment number of 120 in the Calvert Cliffs ISFSI USAR to the proposed 132 HSMs.

The staff noted that a detailed configuration of the new 1X12 array pad that is required for a license amendment is not included in the application.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 5-7 Provide a new Enclosure (3) to Attachment (1) with readable drawings.

The staff notes that the drawing package of Enclosure (3) is in accordance with Regulatory Guide 3.48, Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage); however, many of the details or the drawings are illegible.

This information is needed to demonstrate compliance with 10 CFR 72.24.

Chapter 6 Thermal Evaluation

- 6-1 Provide the information identified in NUREG -1567, Sections 6.4 and 6.5. The application requests the staff's approval of the use of new HSM-HBs and NUHOMS-32PHB DSCs. However, details of the HSM-HB and NUHOMS-3PHB DSCs design and analysis were not provided in the application. Alternatively, provide all calculation packages referenced in the application and revise the comparison matrix to cross-reference the NUREG-1567 acceptance criteria with specific Sections, Tables, Figures, and/or Appendices of the application, ISFSI USAR, and/or calculations packages. It may be necessary to also cross-reference portions of the NUREG-1536 (as referenced in NUREG -1567) acceptance criteria based on the new canister design and HSM proposed below.

The application should include sufficient information to ensure that a thermal evaluation can be completed. Without the information identified in NUREG-1567, Sections 6.4 and 6.5, the staff cannot perform a complete thermal review for the following requests to:

- Approve a new NUHOMS®-32PHB canister design and a new HSM-HB) for use at the Calvert Cliffs ISFSI
- Expansion of the ISFSI total capacity from 120 horizontal storage modules (HSMs) to 132 HSMs on the existing site
- Approve the modified or new Technical Specifications (TS): 3.1.1(5), 3.3.2.1, 3.3.3.1, and 3.4.1.1.

For example, Sections 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.4.5, 6.5.1, 6.5.2, 6.5.3, 6.5.4 and 6.5.5 are relevant considering that the amendment is based on: 1. new fuel content (high burnup fuel) with increased maximum fuel assembly heat loads, 2. a new dry shielded

canister, 3. a new modular high burnup horizontal storage module, 4. an increased number of horizontal storage modules, 5. Modified or new TS: 3.1.1(5), 3.3.2.1, 3.3.3.1, and 3.4.1.1.

This information is needed to demonstrate compliance with 10 CFR 72.24 and 10 CFR 72.56.

- 6-2 Clearly indicate in the application which, if any, referenced documents are incorporated by reference. Also provide all documents considered to be incorporated by reference.

The application states, "A referenced document shall be considered to be a part of the USAR only if it is clearly annotated as being "incorporated by reference" in Chapter 13 of this report. Documents that are incorporated by reference are subject to the same administrative controls and regulatory requirements as the USAR."

The staff did not find any referenced documents that were incorporated by reference and therefore did not review any referenced documents as part of the application.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 6-3 Clarify if the application requires the evaluation of upgrading portions of the Calvert Cliffs ISFSI.

A previous submittal of this application requested to: "Upgrade portions of the Calvert Cliffs ISFSI to allow use of the prefabricated high burnup horizontal storage modules (HSM-HB) for future expansion." It is not clear from the application if this is still being requested.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 6-4 Provide ANSYS input and output files to support the thermal evaluation and the licensing requests.

The staff cannot begin to perform a thermal acceptance review, or a complete thermal review without ANSYS input and output files that support the requests summarized in RSI 1. The staff specifically prefers text based files (i.e. .inp) with an appropriate level of comments to allow for a timely technical review.

This information is needed to demonstrate compliance with 10 CFR 72.24.

- 6-5 Revise the application to justify the design similarity claims.

The application frequently refers to how the NUHOMS-32PHB canister design and the HSM-HB are similar to previous designs, but it is not clear what previously submitted documentation the staff should refer to determine if the similarity claims are justified. The applicant needs to identify the similarities of these two designs and demonstrate that the analyses the application references to are applicable to the new design.

This information is needed to demonstrate compliance with 10 CFR 72.24.

6-6 Provide legible licensing drawings.

The staff cannot read the licensing drawings. Because the licensing drawings were not legible, the staff could not review them for the acceptance review.

This information is needed to demonstrate compliance with 10 CFR 72.24.

Chapter 9 Confinement Evaluation

9-1 Provide readable drawings so that a review and understanding of the DSC can be performed.

- a) Enclosure 3 of the application included 13 drawings that were difficult to read. Provide larger drawings or drawings with higher resolution.
- b) Some of the drawings in Enclosure 3 were not included. For example, NUH32PHB-30-1 indicates there are 2 sheets, but only sheet 1 of 2 was included.
- c) Provide drawings listed in Section 6.6.1 of Appendix 6.6 of NUH32PHB-0600.

This information is needed to determine compliance with 10 CFR 72.24.

9-2 Provide a drawing and explicit description of the confinement boundary.

- a) Per Section 9.5.1 of NUREG-1567, details of the confinement boundary should be provided, including a clear drawing and description of the entire confinement boundary. In addition, drawings or sketches defining “top shield plug closure weld” (page 5), “top cover plate weld” (page 5), and “double seal welded primary and secondary closures” at the top and bottom ends of the DSC (page 5 and 13.3-8) would aid in understanding the confinement boundary.
- b) Note 1 in Drawing NUH32PHB-30-20 indicates the presence of an O-ring. The details of the O-ring groove and O-ring, including its purpose, should be provided. In addition, specify if there are O-ring degradation issues over the license period.

This information is needed to determine compliance with 10 CFR 72.24.

9-3 Provide details that show the design and operation of the DSC will keep the fuel and cladding from degrading.

- a) Per Section 9.4.4.1 of NUREG-1567, the fuel and cladding must be protected from degradation. Aspects of the design and operation of the DSC that protect the fuel and cladding should be provided, especially considering that the DSC is a new design and a new cladding material would be stored within the DSC.
- b) Per Section 9.5.4.1 of NUREG-1567, the application should indicate the design features and procedures for drying, evacuation, and backfilling that meet the oxidizing criteria within the DSC.

This information is needed to determine compliance with 10 CFR 72.24.

- 9-4 Provide an evaluation and supporting documents, e.g. stainless steel corrosion and SCC AMP, etc., that ensures confinement integrity would be maintained by the NUHOMS-

32PHB DSC for the 40 year license period, especially due to the effects of chlorine-induced stress corrosion cracking (CISCC).

NRC Information Notice 2012-20 has indicated that CISCC can affect the integrity of stainless steel vessels/piping via through-wall cracks over time. An analysis and discussion are necessary that confirm the NUHOMS-32PHB DSC, which is constructed from stainless steel, will maintain confinement.

This information is required to evaluate compliance with 10 CFR 72.24 (d) and 10 CFR 72.122(b)(1).

Observations

- 4-1 Provide and augment the aging management programs (AMP) supplied in the CC ISFSI license renewal application that addresses the requested increase in fuel burnup, aging related degradation mechanisms, and new equipment requested in LAR 2505-11.

The CC ISFSI license renewal application is currently undergoing staff review. The application and subsequent staff evaluation does not contain AMPs for the new system, structures, and components requested in this amendment application. The requested AMPs are necessary because LAR 2505-11 will be processed in conjunction with or after the CC ISFSI license renewal application which implies that the total licensing period for the requested system in LAR 2505-11 is 60 years.

- 6-1 Address the use of forced cooling during transfer operations.

Forced cooling during transfer operations is briefly mentioned in Section 13.3.2.5.3 of the application, specifically, "When utilized with the NUHOMS-32PHB DSC, the transfer cask is in the forced-cooling configuration for heat loads greater than Table 7-1 of Reference 13.26, Section 7." It appears that forced cooling will be used during each transfer operation for heat loads greater than Table 7-1 of Reference 13.26, Section 7.

- 9-1 Confirm that the entire confinement boundary is helium leak tested to the "leaktight" criteria or provide a confinement dose analysis for the NUHOMS-32PHB DSC.

Section 13.3.3.2 and Section 13.8.2.8 mention that the NUHOMS-32PHB DSC is leak tested to "leaktight" criteria (per ANSI N14.5) after loading and therefore does not require a confinement dose analysis (page 15 of application). Although page 15 of the application indicates that the top shield plug closure weld and the siphon and vent port cover welds would be tested to 1E-7 ref-cc/sec, the leak test rates of longitudinal and circumferential shell welds, shell to baseplate weld, base metal, etc., were not specified in the application. It is necessary to test the entire confinement boundary to the "leaktight" criterion in order to forego a confinement dose analysis. If not tested to the "leaktight" criterion, it is necessary to test the entire confinement boundary to the allowable reference leakage rate. The allowable reference leakage rate would be determined from a confinement dose analysis using release fractions that have been justified for high burnup fuel. Additional guidance on this issue can be found in Interim Staff Guidance-25.

Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, ISFSI

cc:

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