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Christopher J. Wamser
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BVY 14-059

August 6, 2014

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Technical Specifications Proposed Change No. 306 Eliminate Certain ESF Requirements during Movement of Irradiated Fuel - Supplement 2
(TAC No. MF3068)
Vermont Yankee Nuclear Power Station
Docket No. 50-271
License No. DPR-28

REFERENCES:

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Technical Specifications Proposed Change No. 306 Eliminate Certain ESF Requirements during Movement of Irradiated Fuel," BVY 13-097, dated November 14, 2013 (TAC No. MF3068) (ML13323A516)

2. Email, USNRC to Entergy Nuclear Operations, Inc. "RAI - Eliminate Certain ESF Requirements During Fuel Movement (TAC No. MF3068)," dated July 29, 2014 (ML14210A159)

Dear Sir or Madam:

By letter dated November 14, 2013 (Reference 1), Entergy Nuclear Operations, Inc. (ENO) proposed an amendment to Renewed Facility Operating License (OL) DPR-28 for Vermont Yankee Nuclear Power Station (VY). The proposed amendment would change the Technical Specification (TS) requirements associated with operability requirements for secondary containment when handling sufficiently decayed irradiated fuel or a fuel cask.

In Reference 2, the NRC provided VY with a Request for Additional Information (RAI) regarding the proposed changes. Attachment 1 of this letter provides the responses to the RAI.

The conclusions of the no significant hazards consideration and the environmental considerations contained in Reference 1 are not affected by, and remain applicable to, this supplement.

This letter contains no new regulatory commitments.

If you have any questions on this transmittal, please contact Mr. Philip Couture at 802-451-3193.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 6, 2014.

Sincerely,

Michael A. Romeo Sr

for CJW

CJW/plc

Attachment: 1. Response to Request for Additional Information

cc: Mr. William M. Dean
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U.S. Nuclear Regulatory Commission
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Mr. James S. Kim, Project Manager
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Attachment 1

Vermont Yankee Nuclear Power Station

Response to Request for Additional Information

REQUEST FOR ADDITIONAL INFORMATION
BY CONTAINMENT AND VENTILATION BRANCH
REVIEW OF TECHNICAL SPECIFICATIONS PROPOSED CHANGE NO. 306
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

By letter dated November 14, 2013 (Reference 1), Entergy Operations, Inc. (Entergy, or the licensee) submitted a license amendment request (LAR) for Vermont Yankee Nuclear Power Station (VY), which proposes to change the requirements associated with handling irradiated fuel and performing core alterations in its Renewed Facility Operating License and Technical Specifications (TS).

The Containment and Ventilation Branch (SCVB) staff has reviewed the LAR and is requesting responses to the following items to complete its review:

SCVB-RAI-1: TSTF-51

Section 2.2 of Reference 1, Attachment 1 describes that VY will commit the two guidelines as described in the "Reviewer's Note" of TSTF-51, "Revise Containment Requirements During Handling Irradiated Fuel and Core Alterations" if the term "recently" is to be added to the TS. Regarding the commitment, please address the following questions:

(a) For the first guideline, has VY assessed the ventilation system and radiation monitor availability with respect to filtration and monitoring of release from the fuel? Please provide the assessment.

(b) For the second guideline, justify that the proposed contingency plans will meet the "prompt" purpose with respect to enabling ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored.

Response

(a) As stated in the regulatory commitment made in Reference 1, an assessment of ventilation system and radiation monitor availability will be completed prior to use of the amendment. This means that an assessment would have to be performed prior to any fuel handling operations with openings in secondary containment following permanent defueling of the VY reactor. A formal assessment has not been completed because Entergy Nuclear Operations, Inc. (ENO) anticipates completion of permanent defueling of VY in January 2015. This will allow sufficient time to complete an assessment prior to movement of fuel following implementation of the approved amendment that is based on ventilation system and radiation monitoring availability and decay of the spent fuel, since as noted in the response to RAI 2 in Reference 2, ENO has changed the requested approval date of the proposed changes to be contingent upon the docketing of the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel in accordance with 10 CFR 50.82(a)(1)(i) and (ii) and following a minimum of 13 days after the permanent cessation of operations. ENO also notes that the assessment may need to be re-performed following extended periods between fuel handling operations. Items that may be considered during the assessment include:

i. Availability of the Standby Gas Treatment System

ii. Availability of the Reactor Building Ventilation System
iii. Availability of Refuel Floor and Reactor Building Exhaust Ventilation Monitors
iv. Availability of the Stack Gas Radiation Monitor
v. Potential modifications to change the filtration capability of the Reactor Building Ventilation System
vi. Analysis to determine when sufficient decay of the spent fuel has occurred such that the filtration of a main stack release would be inconsequential to the Total Effective Dose Equivalent at the Exclusion Area Boundary.

(b) Contingency methods to ensure prompt closure of openings in secondary containment have not been finalized. Similar to the response in part (a), the regulatory commitment provided in Reference 1 requires that the contingency methods be implemented prior to use of the amendment. Since ENO anticipates completion of permanent defueling of VY in January 2015, there will be sufficient time prior to movement of fuel following implementation of the approved amendment to develop and provide training on robust measures to ensure that the contingency methods will implemented promptly. ENO also notes that there will be inherent variability in each contingency plan that is implemented prior to a period of fuel handling operations due to the unique set of conditions likely to be present in terms of the number, and location, of open penetrations in secondary containment.

The contingency methods will include the specific measures that can used to minimize the response time to an event requiring implementation of the contingency plans and ensure that openings are promptly closed. These methods are described in the regulatory commitment provided in Reference 1 and are repeated here for convenience:

Contingency plans for prompt closure of openings will include the following:

- *Equipment and tools needed to facilitate closure will be staged,*
- *Personnel responsible for closure will be knowledgeable and trained in the procedures for establishing building integrity,*
- *The closure response team will be accompanied by a Radiation Protection (RP) technician for radiation protection monitoring,*
- *Hoses and cables routed through openings will employ a means to allow rapid, safe disconnect and removal, and*
- *One door in each airlock will be capable of expeditious closure*

SCVB-RAI-2: Water Level

In Table 3-1, VYNPP-Design Input for FHA, of Reference 1, Attachment 4, the data for required water depth above fuel (B3) is input as 23 ft to support the overall pool decontamination factor data as input (B2). Is there any plant procedure in place to assure such a minimum water level of spent fuel pool or reactor cavity pool to be maintained?

Response

Site procedure OP 1101, Management of Refueling Activities and Fuel Assembly Movement, contains a prerequisite to ensure that the reactor cavity is flooded, fuel pool gates removed and water level maintained greater than or equal to 36 feet 10 inches in the spent fuel pool (SFP) (measured from the bottom of the SFP) prior to fuel movement. It is noted that maintaining the SFP level of 36 feet 10 inches during fuel movement does not ensure that 23 feet of water is maintained above a postulated dropped and damaged fuel assembly within the SFP (36 feet 10 inches

corresponds to the SFP low level alarm). However, as discussed below, the radiological consequences of a FHA in the SFP are considered to be bounded by the design basis FHA over the reactor core. During normal plant operations, water level is maintained 23 feet above the top of the active fuel in the SFP storage racks.

Having the reactor cavity flooded during refueling operations ensures that 23 feet of water is maintained over the fuel in the reactor core, given that the existing VY design basis FHA (Calculation VYC-2299, Radiological AST Fuel Handling Accident) is based on the drop of a fuel assembly onto the core. The design basis FHA also considers a FHA 24 hours after shutdown. The analysis utilized damaged rods from drop heights of 34 feet utilizing the General Electric Standard Application for Reactor Fuel, GESTAR II method and 30 feet based on the maximum height allowed by VY refueling equipment. A fuel assembly drop height of 34 feet was used in conjunction with a decontamination factor of 200 (associated with 23 feet of water above damaged fuel). The FHA analysis of record is based on a fuel assembly drop of 34 feet onto the core, 24 hours after shutdown. This is considered to be bounding compared to a drop of significantly less height of a fuel assembly over the spent fuel pool. The license amendment request (Reference 1) and accompanying analysis to allow fuel moves with an open containment with a period of sufficient radioactive decay (fuel moves at 13 days) is considered to be bounded by the existing analysis of record (fuel moves at 24 hours).

SCVB-RAI-3: Release Path

In Table 3-3, Atmospheric Dispersion Factors for the Postulated FHA, of Reference 1, Attachment 4, it indicates that the only release path from reactor building is via the reactor building blowout panel. Is there any other leakage path to plant personnel, main control room, existing?

Response

The release point selected for the analysis was a RB blowout panel located near the main control room air intake as this creates the most limiting combination of release point and the receptor point. The use of this limiting combination in the analysis ensures that any other potential leakage paths to the main control room are bounded by the results.

SCVB-RAI-4: Fuel Assembly Drop or Fuel Cask Drop?

In Section 3.6, Fuel Cask Movement, of Reference 1, the statement starting from the third sentence in the first paragraph looks like described for the drop of fuel assembly not for fuel cask drop. Clarify the information presented in this paragraph is for fuel assembly drop or fuel cask drop.

Response

The information in the paragraph was intended to show that a drop of a fuel cask is not a credible event. The first paragraph of Section 3.6 of Reference 1 should read as follows (changes are shown in underline/strikethrough format):

> The operability requirements during movement of a fuel cask for ESF mitigation are deleted as part of this proposed license amendment. There is no ~~The only~~ accident postulated during handling of a fuel cask ~~is the FHA~~, as the crane is considered to be single failure proof as described below. The design basis accident FHA only assumes an irradiated fuel assembly is dropped onto the reactor core from the maximum height allowed by the fuel

handling equipment. The analysis assumes that the entire amount of potential energy is available for application to the fuel assemblies involved in the accident. Also, none of the energy associated with the dropped fuel assembly is absorbed by the fuel material.

SCVB-RAI-5: Audit

Other than RG 1.183, there are four major references providing the input data and information for the re-analysis of AST/FHA (Attachment 4 of Reference 1). To have a complete review and facilitate the review, provide the following references for audit via electronic reading room:

3.* **ENTERGY Calculation VYC-2299, "Radiological AST Fuel Handling Accident Analysis [PSAT 3019CF.QA.05, Rev. 0]" (Jun. 2003)**

4. **AREVA NP Document 32-9053350-001, "ELISA-2 -A Software Package for the RadiologicalEvaluation of Licensing and Severe Accidents at Light-Water Nuclear Power Plants Based on the Classical and Alternative-Source-Term Methodologies" (Aug. 2008) [See also AREVA NP Document 2A4.26-2A4-ELISA2-2.4_UsersManual-000, "ELISA-2 Version 2.4 User's Manual - Revision 2".]**

9.* **ENTERGY Calculation VYC-2260, "Bounding Core Inventories of Actinides and Fission Products for Design-Basis Applications at 1950 MWt" (Rev. 0, Feb. 2003)**

10.* **ENTERGY Calculation VYC-2275, "Control Room Air Intake X/Q Due to Release from Reactor Building Blowout Panel Using Arcon96 Methodology" (Rev. 0, April 2003)**

Response

The listed documents will be made available to the NRC staff via electronic reading room or other appropriate means.

REFERENCES

1. Letter, Entergy Nuclear Operations, Inc. to NRC, "Technical Specifications Proposed Change No. 306, Eliminate Certain ESF Requirements during Movement of Irradiated Fuel, Vermont Yankee Nuclear Power Station, Docket No. 50-271 License No. DPR-28", BVY 13-097, dated November 14, 2013 (ML13323A516) (TAC No. MF3068)
2. Letter, Entergy Nuclear Operations, Inc. to NRC, "Technical Specifications Proposed Change No. 306 Eliminate Certain ESF Requirements during Movement of Irradiated Fuel - Supplement 1 (TAC No. MF 3068)," BVY 14-036, dated June 9, 2014