



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 15, 2009

Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT – SUPPLEMENTAL INFORMATION NEEDED
FOR ACCEPTANCE OF REQUESTED LICENSING ACTION
(TAC NO ME2162)

Dear Sir:

By letter dated September 1, 2009, (Agencywide Documents Access and Management System ML092450683), Entergy Nuclear Operations submitted a license amendment request for Palisades Nuclear Plant. The proposed amendment request would maintain the effective neutron multiplication factor (Keff) limits for Region I storage racks based on analyses to maintain Keff less than 1.0 when flooded with unborated water, and less than, or equal to, 0.95 when flooded with water having a minimum boron concentration of 850 ppm during normal operations. The proposed change was evaluated by the licensee for both normal operation and accident conditions. The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this amendment request. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the technical specifications), must fully describe the changes requested, and following as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment request in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that the licensee supplement the application to address the information requested in the enclosure by November 3, 2009. This will enable the NRC staff to begin its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC will cease its review activities associated with the application. If the application is subsequently accepted for review, you will

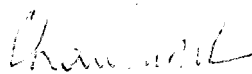
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be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter was discussed with Edward Weinkam of your staff on October 8, 2009.

If you have any questions, please contact the Palisades Project Manager, Mahesh Chawla, at (301) 415-8371.

Sincerely,



Mahesh Chawla, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
As stated

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SUPPLEMENTAL INFORMATION NEEDED

AMENDMENT REQUEST – SPENT FUEL POOL REGION I CRITICALITY

ENTERGY NUCLEAR OPERATIONS, INC.

PALISADES NUCLEAR PLANT

DOCKET NO. 50-255

1. The swelling model is not supported. Provide the following information about the swelling model.
 - a. The licensee has not justified the assumption of back filling the swollen volume with spent fuel pool (SFP) water. The licensee has indicated that the cause of the swelling is unknown yet has assumed that the volume created by the swelling is backfilled with SFP water. In the application, the licensee states that there are paths for the gas to escape. The staff considers the most probable causes of swelling to be either gas accumulation or swelling of the carborundum itself. If accumulated gases are causing the swelling, then the racks cannot be considered to be vented and presumably the gas would remain in the swollen area. If the carborundum itself is swelling, then it is displacing the water. In either case, filling the swollen volume with SFP water would be non-conservative. Therefore, the staff requests the licensee to provide additional information regarding the cause of the swelling and what is filling the swollen volume before it can begin its review.
 - b. The licensee has applied its swelling model to only two cells in an 8x8 array. As mentioned above, there is no indication that the licensee knows what is causing the swelling or how wide spread it is or isn't. Therefore, before the staff can begin its review, the staff requests the licensee to provide additional information regarding the current extent of the swelling and include its future propagation throughout the SFP.
 - c. In its swelling model, the licensee used conservation of mass when evaluating the swelling of the outside wall of a storage cell into the area between storage cells, but did not use conservation of mass when evaluating the swelling of the inside wall of a storage cell into the open area of a storage cell. The staff believes that the swelling would cause material thinning in both instances. Therefore, the staff needs the licensee to provide additional information regarding the modeling of the cell walls when swollen before it can begin its review.
2. The validation of the KENO-V.a computer code is insufficient. Provide the following information about the swelling model.

The licensee benchmarked the KENO-V.a computer code, a part of the SCALE 4.4a package that was used to calculate against 100 critical systems (criticality benchmark

Enclosure

experiments) using the 44 group cross sections, yet none of those experiments included a full set of the Actinides or Fission Products important to a spent nuclear fuel criticality analysis. Critical experiments containing Actinides have been available to NRC licensees since November 2008, with the publishing of NUREG/CR-6979, Evaluation of the French Haut Taux de Combustion (HTC) Critical Experiment Data. Since criticality experiments the licensee used in the benchmark do not include Actinides and Fission Products, the benchmarks do not fully satisfy the area of applicability for the analysis. Therefore, the staff needs the licensee to provide additional information concerning the effect of using the benchmark experiments with Actinides and the effect of not having fission product benchmark experiments on the code bias and bias uncertainty determined in its validation before it can begin its review.

3. In the discussion about its burnup credit methodology the licensee states, "The process is complicated by the fact that KENO-V.a cross section data bases do not have the ability to accept all of the isotopes for a burned assembly (i.e., actinides plus all fission products) and CASMO-3 uses a "lumped" fission product cross section set. Therefore, an intermediate step is needed in which CASMO-3 is used to perform a reactivity equivalencing calculation with the rack geometry for the given burnup state point in which B-10 is used to represent the lumped fission products." Yet SCALE 4.4a and KENO V.a are capable of accepting virtually every isotope in the ENDF/B-V library used by the licensee. Additionally, it is not clear what actinides and fission products are in the "lumped" B10 equivalent. It is not clear how the use of a "lumped" B-10 equivalent affects the validity of the validation or the subsequent criticality analysis when evaluating the biases, uncertainties, and soluble boron requirements. Therefore the staff needs the licensee to provide additional information concerning the effect of using a "lumped" B-10 equivalent, especially beyond the "lumped" fission product created by CASMO-3 before it can begin its review.

be advised of any further information needed to support the staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter was discussed with Edward Weinkam of your staff on October 8, 2009.

If you have any questions, please contact the Palisades Project Manager, Mahesh Chawla, at (301) 415-8371.

Sincerely,

/RA/

Mahesh Chawla, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
As stated

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