

May 12, 2004

Mr. Joseph E. Venable
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3) -
REQUEST FOR ADDITIONAL INFORMATION RELATED TO REQUEST FOR
EXEMPTION TO THE CLADDING MATERIAL SPECIFIED IN TITLE 10 OF THE
CODE OF FEDERAL REGULATIONS (10 CFR) 50.46 AND 10 CFR PART 50
APPENDIX K TO ALLOW USE OF OPTIMIZED ZIRLO™ LEAD TEST
ASSEMBLIES (LTAs) (TAC NO. MC2999)

Dear Mr. Venable:

By letter dated April 30, 2004, Entergy Operations, Inc. has requested for exemption to the cladding material specified in 10 CFR 50.46 and 10 CFR Part 50 Appendix K to allow use of Optimized ZIRLO™ LTAs.

After reviewing your request, the Nuclear Regulatory Commission staff has determined that additional information is required to complete the review. We discussed this information with your staff by telephone and they agreed to provide the additional information requested in the enclosure within 30 days of receipt of this letter.

If you have any questions, please call me at (301) 415-1480.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

EXEMPTION TO 10 CFR PART 50.46, AND 10 CFR PART 50 APPENDIX K

ENTERGY OPERATIONS, INC. (ENTERGY)

WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3)

DOCKET NO. 50-382

By letter dated April 30, 2004, Entergy requested an exemption from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.46, and 10 CFR Part 50 Appendix K. The purpose of this exemption would allow the use of up to four lead test assemblies fabricated with a "low tin" version of ZIRLO™, called Optimized ZIRLO™. The Nuclear Regulatory Commission (NRC) staff has reviewed the information provided and in order to complete the evaluation, the following additional information is requested:

1. Attachment 1, Page 1, of letter dated April 30, 2004, states, "Westinghouse Electric Company LLC (Westinghouse) has submitted Addendum 1 to WCAP-12610-P-A/CENPD-404-P-A that addresses Optimized ZIRLO™ and demonstrates that Optimized ZIRLO™ has essentially the same properties as currently licensed ZIRLO™ and fits the definition of ZIRLO™ that was used when the "Rule" change was made to 10 CFR 50.46." Review of Addendum 1 is currently underway and this conclusion has not been acknowledged by the staff. Review of this exemption request needs to remain independent of Addendum 1 to WCAP-12610-P-A/CENPD-404-P-A. Instead of referencing Addendum 1, provide all necessary supporting material.
2. Describe the fuel management guidelines and supporting safety analyses used to ensure that the Lead Test Assemblies (LTAs) are not placed in limiting locations.
3. The exemption request does not specify fuel duty targets for the four LTAs.
 - Please provide fuel duty targets for the four LTAs, including projected burnup for each reload cycle.
 - Is the projected burnup expected to exceed the current licensed limit for ZIRLO™?
 - Is projected fuel duty expected to exceed limits of less than 100 microns of predicted oxidation with no blistering or spallation?
4. The exemption request does not specify post-irradiation examinations for the four LTAs. Please provide the details of the examinations (e.g., visual, fuel assembly length, fuel assembly bow, fuel assembly drag, fuel rod length, fuel rod wear, fuel rod profilometry, cladding oxidation, etc.) planned for the LTAs.

Enclosure

5. How will Entergy/Westinghouse ensure that fuel performance models and fuel duty predictions remain conservative for this developmental cladding material, especially in subsequent cycles.

6. Page 4 of Attachment 1 of Entergy letter referenced above states:

“Application of the Baker-Just equation has been demonstrated to be appropriate for the Optimized ZIRLO™ alloy. Due to the similarities in the composition of the Optimized ZIRLO™ and standard ZIRLO™, the application of the Baker-Just equation will continue to conservatively bound all post-LOCA [loss-of-coolant accident] scenarios.”

- In the first sentence, did you mean to state that the Baker-Just equation has been demonstrated to be appropriate for standard ZIRLO™?
- If yes, please identify where the Baker-Just equation has been previously demonstrated to be appropriate for Optimized ZIRLO™?

7. In page 2 of Attachment 1 of the letter, it states: “The Waterford 3 LTAs may also contain the following changes relative to the current fuel design in the core ...” and there are seven changes listed as follows:

“1) a brazed top Inconel grid, 2) advanced Mid grids with “I” spring rod supports, 3) the addition of two Intermediate Flow Mixing (IFM) grids, 4) selected mid grids and IFM grids will have Side Supported mixing vanes, 5) the Mid and IFM grids will be constructed with Optimized ZIRLO™ material, 6) the guide tubes will be fabricated with standard ZIRLO™ material, and 7) the fuel rod design will be the standard Westinghouse 0.374 inch rod instead of the standard Combustion Engineering 0.382 inch rod.”

Additionally, on page 3 of Attachment 1, it states: “The features of the LTAs do not challenge the validity of the standard methodologies” and “Thermal-hydraulic LOCA and non-LOCA transient safety analysis evaluations will be performed for the LTAs.”

The review of this exemption will be solely for the change in material of the cladding specified in 10 CFR 50.46, namely, from standard ZIRLO™ to Optimized ZIRLO™, and not for the evaluation of the LTA features and/or the evaluations done for the LTAs. Given this, please explain the relevance of such details on 1) changes relative to the current fuel design in the core, 2) features that challenge the validity of the standard methodologies, and 3) evaluation of thermal-hydraulic LOCA and non-LOCA transient safety analysis for the LTAs.

8. On page 4 of Attachment 1, it states: “Therefore, it can be concluded that the ECCS [emergency core cooling system] performance of the Waterford 3 core will not be adversely affected by the insertion of eight Optimized ZIRLO™ LTAs.” Please clarify the discrepancy in the number of LTAs planned to be used.

Waterford Steam Electric Station, Unit 3

cc:

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