



Constellation Energy

March 24, 2006

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

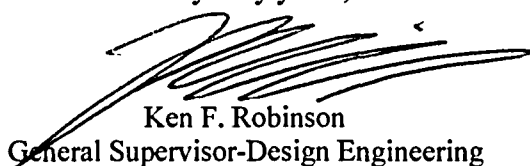
SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Independent Spent Fuel Storage Installation; Docket No. 72-8
Report of Changes, Tests, and Experiments – 10 CFR 50.59 and 10 CFR 72.48

In accordance with 10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2), Calvert Cliffs Nuclear Power Plant, Inc. hereby submits a report containing brief descriptions of changes, tests, and experiments approved under the provisions of 10 CFR 50.59 and 10 CFR 72.48.

Attachment (1) of this report includes 10 CFR 50.59 and 10 CFR 72.48 evaluations recorded and approved between January 1, 2005 and December 31, 2005.

Should you have questions regarding this matter, please contact Mr. L. S. Larragoite at (410) 495-4922.

Very truly yours,



Ken F. Robinson
General Supervisor-Design Engineering

KFR/PSF/bjd

Attachment: (1) Calvert Cliffs Nuclear Power Plant Report of Changes, Tests, and Experiments
[10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2)]

cc: P. D. Milano, NRC
S. J. Collins, NRC

Resident Inspector, NRC
R. I. McLean, DNR

NM5501

ATTACHMENT (1)

**CALVERT CLIFFS NUCLEAR POWER PLANT
REPORT OF CHANGES, TESTS, AND EXPERIMENTS
[10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2)]**

| Document Id | Doc Type | Rev Status | Revision | Date Issued |
|-------------|--|------------|----------|-------------|
| SE00495 | 50.59 | 64 | 0003 | 3/11/2005 |
| Subject | ES200300217-000, Revision 3 (UNIT 2 CYCLE 16 CORE RELOAD (2005 RFO)) | | | |
| Summary | <p>The proposed activity is the core reload and operation of Unit 2 Cycle 16 (2005-2007) in all plant modes.</p> <p>Scope:</p> <ul style="list-style-type: none"> • Implement Zirc diboride Intergral Fuel Burnable Absorber (replaces Erbium) • Implement Annular Fuel Pellets • Implement Low Enriched Axial Blankets (2.6 w/o fuel) • Implement Radial Enrichment Zoning • Increase fresh fuel batch enrichment to up to 4.60 w/o • Increase fuel cycle length (~4.2% longer than any previous cycle) • Implement more aggressive fuel assembly management called the "T" pattern. • Implement ABB-TV Heat Transfer DNB Correlation (already in use on Unit 1) • Implement the Westinghouse physics APA code set (ANC/PARAGON) • Implement Xenon Swing Analytical Methodology • Incorporate Thermal Power uprate of up to 1.4% to 2737 MWt (Appendix K) • Increase COLR peaking limits to $F_{xy}^T=1.70$ and $F_r^T = 1.65$ (before and after Appendix K uprate) • Core Loading Pattern/Cycle Length/Cycle Specific Parameters • CECOR Library Replacement Mid-Cycle (as required) • Potential for Grid to Rod Fretting • Core Operating Limits Report (COLR) Changes • Refueling Boron Concentration/Credited CEAs/Incore Shuffle • UFSAR & Technical Requirements Manual TNC 15.3.3 Change for Incore Instruments • UFSAR Changes for Batch 2V, cycle specific parameter updates, ICIs, Chapter 14 events • Replace all remaining old CEAs (64) • Insert both Framatome and Westinghouse test LFAs for a 2nd cycle of irradiation. <p>ES200300217-000 Revision 3 authorized the alternate core loading pattern for operation in all plant Modes.</p> <p>Since the NRC has already issued a change to Tech Spec 5.6.5 to add a reference to the Zirc Diboride Topical Report and references to the Westinghouse physics APA code set, no license amendment request is required to implement this alternate core loading pattern for U2C16 in all plant Modes.</p> <p>This proposed activity has been evaluated against the 8 criteria of 10CFR50.59 (c)(2), with the conclusion that the proposed activity does not require prior NRC approval.</p> | | | |

| Document Id | Doc Type | Rev Status | Revision | Date Issued |
|-------------|---|------------|----------|-------------|
| SE00495 | 50.59 | 64 | 0002 | 3/8/2005 |
| Subject | ES200300217-000, Revision 2 (ALTERNATE CORE LOADING PATTERN (MODES 5 AND 6 ONLY)) | | | |
| Summary | <p>The proposed activity is the core reload and operation of Unit 2 Cycle 16 (2005-2007) in all plant modes.</p> <p>Scope:</p> <ul style="list-style-type: none"> • Implement Zirc diboride Intergral Fuel Burnable Absorber (replaces Erbium) • Implement Annular Fuel Pellets • Implement Low Enriched Axial Blankets (2.6 w/o fuel) • Implement Radial Enrichment Zoning • Increase fresh fuel batch enrichment to up to 4.60 w/o • Increase fuel cycle length (~4.2% longer than any previous cycle) • Implement more aggressive fuel assembly management called the "T" pattern. • Implement ABB-TV Heat Transfer DNB Correlation (already in use on Unit 1) • Implement the Westinghouse physics APA code set (ANC/PARAGON) • Implement Xenon Swing Analytical Methodology • Incorporate Thermal Power uprate of up to 1.4% to 2737 MWt (Appendix K) • Increase COLR peaking limits to $F_{xy}^T = 1.70$ and $F_r^T = 1.65$ (before and after Appendix K uprate) • Core Loading Pattern/Cycle Length/Cycle Specific Parameters • CECOR Library Replacement Mid-Cycle (as required) • Potential for Grid to Rod Fretting • Core Operating Limits Report (COLR) Changes • Refueling Boron Concentration/Credited CEAs/Incore Shuffle • UFSAR & Technical Requirements Manual TNC 15.3.3 Change for Incore Instruments • UFSAR Changes for Batch 2V, cycle specific parameter updates, ICIs, Chapter 14 events • Replace all remaining old CEAs (64) • Insert both Framatome and Westinghouse test LFAs for a 2nd cycle of irradiation <p>ES200300217-000, Revision 2 authorized the alternate core loading pattern for operation in plant Modes 5 and 6. Additional engineering and a revision to this 50.59 will be required before the alternate core loading pattern may be used in plant Modes 1 through 4.</p> <p>Since the NRC has already issued a change to Tech Spec 5.6.5 to add a reference to the Zirc Diboride Topical Report and references to the Westinghouse physics ANC code set, no license amendment request is required to implement this alternate core loading pattern for U2C16 in plant Modes 5 and 6.</p> <p>This proposed activity has been evaluated against the 8 criteria of 10CFR50.59 (c)(2), with the conclusion that the proposed activity does not require prior NRC approval.</p> | | | |

| Document Id | Doc Type | Rev Status | Revision | Date Issued |
|-------------|---|------------|----------|-------------|
| SE00495 | 50.59 | 64 | 0001 | 3/4/2005 |
| Subject | ES200300217-000, Revision 1 (ALTERNATE CORE LOADING PATTERN FOR U2C16 (2005-2007)) | | | |
| Summary | <p>The proposed activity is the core reload and operation of Unit 2 Cycle 16 (2005-2007) in all plant modes.</p> <p>Scope:</p> <ul style="list-style-type: none"> • Implement Zirc diboride Intergral Fuel Burnable Absorber (replaces Erbium) • Implement Annular Fuel Pellets • Implement Low Enriched Axial Blankets (2.6 w/o fuel) • Implement Radial Enrichment Zoning • Increase fresh fuel batch enrichment to up to 4.60 w/o • Increase fuel cycle length (~4.2% longer than any previous cycle) • Implement more aggressive fuel assembly management called the "T" pattern. • Implement ABB-TV Heat Transfer DNB Correlation (already in use on Unit 1) • Implement the Westinghouse physics APA code set (ANC/PARAGON) • Implement Xenon Swing Analytical Methodology • Incorporate Thermal Power uprate of up to 1.4% to 2737 MWt (Appendix K) • Increase COLR peaking limits to $F_{xy}^T = 1.70$ and $F_r^T = 1.65$ (before and after Appendix K uprate) • Core Loading Pattern/Cycle Length/Cycle Specific Parameters • CECOR Library Replacement Mid-Cycle (as required) • Potential for Grid to Rod Fretting • Core Operating Limits Report (COLR) Changes • Refueling Boron Concentration/Credited CEAs/Incore Shuffle • UFSAR & Technical Requirements Manual TNC 15.3.3 Change for Incore Instruments • UFSAR Changes for Batch 2V, cycle specific parameter updates, ICIs, Chapter 14 events • Replace all remaining old CEAs (64) • Insert both Framatome and Westinghouse test LFAs for a 2nd cycle of irradiation <p>ES200300217-000, Revision 1 authorizes an alternate core loading pattern for Unit 2 Cycle 16 (U2C16). Fuel "sipping" during the 2005 refueling pattern identified that fuel assembly 2S118 (which was planned on being reinserted into the U2C16 core) contains at least one failed fuel rod. This fuel assembly may be reused provided that the leaking pin(s) are replaced with stainless steel rod(s) per previously approved limits. The alternate core loading pattern does not use 2S118. Either core loading pattern may be used. However, at this time, the alternate core loading pattern is only authorized for Mode 6 plant operation. Additional engineering and a revision to this 50.59 will be required before the alternate core loading pattern may be used in plant modes 1 through 5. Since the NRC has already issued a change to Tech Spec 5.6.5 to add a reference to the Zirc Diboride Topical Report and references to the Westinghouse physics ANC code set, no license amendment request is required to implement this alternate core loading pattern for U2C16.</p> <p>This proposed activity has been evaluated against the 8 criteria of 10CFR50.59 (c)(2), with the conclusion that the proposed activity does not require prior NRC approval.</p> | | | |

| Document Id | Doc Type | Rev Status | Revision | Date Issued |
|-------------|--|------------|----------|-------------|
| SE00495 | 50.59 | 64 | 0000 | 2/24/2005 |
| Subject | ES200300217-000, Revision 0 (UNIT 2 CYCLE 16 CORE RELOAD (2005 RFO)) | | | |
| Summary | <p>The proposed activity is the core reload and operation of Unit 2 Cycle 16 (2005-2007) in all plant modes.</p> <p>Scope:</p> <ul style="list-style-type: none"> • Implement Zirc diboride Intergral Fuel Burnable Absorber (replaces Erbium) • Implement Annular Fuel Pellets • Implement Low Enriched Axial Blankets (2.6 w/o fuel) • Implement Radial Enrichment Zoning • Increase fresh fuel batch enrichment to up to 4.60 w/o • Increase fuel cycle length (~4.2% longer than any previous cycle) • Implement more aggressive fuel assembly management called the "T" pattern. • Implement ABB-TV Heat Transfer DNB Correlation (already in use on Unit 1) • Implement the Westinghouse physics APA code set (ANC/PARAGON) • Implement Xenon Swing Analytical Methodology • Incorporate Thermal Power uprate of up to 1.4% to 2737 MWt (Appendix K) • Increase COLR peaking limits to $F_{xy}^T = 1.70$ and $F_r^T = 1.65$ (before and after Appendix K uprate) • Core Loading Pattern/Cycle Length/Cycle Specific Parameters • CECOR Library Replacement Mid-Cycle (as required) • Potential for Grid to Rod Fretting • Core Operating Limits Report (COLR) Changes • Refueling Boron Concentration/Credited CEAs/Incore Shuffle • UFSAR & Technical Requirements Manual TNC 15.3.3 Change for Incore Instruments • UFSAR Changes for Batch 2V, cycle specific parameter updates, ICIs, Chapter 14 events • Replace all remaining old CEAs (64) • Insert both Framatome and Westinghouse test LFAs for a 2nd cycle of irradiation <p>ES200300217-000, Revision 0 evaluated the operation of Unit 2 Cycle 16 (2005-2007) in all plant modes. New design features implemented for the first time at Calvert Cliffs include Zirc Diboride, axial blankets, annular fuel pellets, and radial enrichment zoning. Some fuel pellets will not be enriched to 4.60 w/o. The ABB-TV DNB correlation (previously implemented on Unit 1) will not be applicable to Unit 2 since the majority of fuel assemblies now contain mixing vanes. Four Lead Fuel Assemblies (LFAs) from Westinghouse and four LFAs from Framatome/AREVA previously inserted during the 2003 RFO will be reinserted during the 2005 RFO for their 2nd cycle of irradiation.</p> <p>Tech Specs 5.6.5 must be revised to add the following 5 new references for Zirc Diboride and the Westinghouse physics codes. AIT ES200300217 Milestone 099 has been opened to verify that the NRC issues this change prior to any Batch 2V fuel being put into the reactor core.</p> <ul style="list-style-type: none"> -WCAP-11596-P-A, "Qualification of the PHOENIX-P, ANC Nuclear Design System for Pressurized Water Reactor Cores". -WCAP-10965-P-A, "ANC: A Westinghouse Advanced Nodal Computer Code" -WCAP-10965-P-A Addendum 1, "ANC: A Westinghouse Advanced Nodal Computer Code; Enhancements to ANC Rod Power Recovery" -WCAP-16072-P-A, "Implementation of Zirconium Diboride Burnable Absorber Coatings in CE Nuclear Power Fuel Assembly Designs" | | | |

-WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON"

This proposed activity has been evaluated against the 8 criteria of 10CFR50.59 (c)(2), with the conclusion that the proposed activity does not require prior NRC approval.

| Document Id | Doc Type | Rev Status | Revision | Date Issued |
|-------------|--|------------|----------|-------------|
| SE00496 | 50.59 | 64 | 0000 | 11/23/2004 |
| Subject | TEMPORARY ALTERATION (T/A) 1-04-0060 (SILICA REMOVAL SKID INSTALLATION/OPERATION SUPPORTING 2005 UNIT 2 RFO) | | | |
| Summary | <p>A temporary filtration skid using reverse osmosis filtration technology will be installed on the 69' elevation of the Auxiliary Building south of the SFP. The skid will be used to filter silica from the SPF by recycling SFP water through flexible supply and return hoses. The skid will require electrical, demineralized water, and compressed air services. This evaluation addresses adverse affects on UFSAR described design functions identified in the 10 CFR 50.59 Screen associated with TA 1-03-042.</p> <p>This activity is for a one time performance of cleaning up silica from the Spent Fuel Pool (SFP). The maximum change in silica concentration that is allowed to be processed from Unit 1 and 2 Spent Fuel Pools shall not exceed 15 ppm.</p> <p>The purpose of this activity is to reduce silica levels in the Spent Fuel Pool (SFP). The source of silica has been determined to be a chemical byproduct of the gradual deterioration of the boraflex poison used in the Unit 2 SFP racks. At high concentrations, silica is a chemical contaminant in the reactor coolant system (RCS). Under operating conditions high concentrations of silica combine with other chemical impurities in the RCS and result in plate-out of insulating compounds on the fuel clad causing reduced heat transfer.</p> <p>This activity is supported by CA06346, Rev. 0. The criticality code, KENO (previously approved by the NRC), was used to calculate the delta k effective between the current design basis Unit 2 fuel rack criticality case and a Unit 2 fuel rack boraflex reduction case. The resulting k-effective was determined to be significantly less than the two-sigma uncertainty associated with the KENO code. As a result, the criteria for determining "not more than a minimal increase" of NEI 96-07, Rev. 1, was met.</p> <p>This proposed activity has been evaluated against the 8 criteria of 10CFR50.59 (c)(2), with the conclusion that the proposed activity does not require prior NRC approval.</p> | | | |