



March 1, 2012

ULNRC-05840

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

10 CFR 50.46

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
FACILITY OPERATING LICENSE NPF-30  
10 CFR 50.46 ANNUAL REPORT  
ECCS EVALUATION MODEL REVISIONS**

- References: 1) ULNRC-05260 dated 3-9-06  
2) ULNRC-05378 dated 3-7-07  
3) ULNRC-05475 dated 3-4-08  
4) ULNRC-05600 dated 3-4-09  
5) ULNRC-05683 dated 3-1-10  
6) ULNRC-05769 dated 3-1-11

Ameren Missouri hereby submits the annual report required per 10 CFR 50.46(a)(3) for Callaway Plant. Attachment 1 to this letter describes changes to the Westinghouse ECCS Large Break and Small Break Loss of Coolant Accident (LOCA) Evaluation Models which have been implemented for Callaway during the time period from March 2011 to March 2012. Attachment 2 provides an ECCS Evaluation Model Margin Assessment which accounts for all peak cladding temperature (PCT) changes resulting from the resolution of prior issues as they apply to Callaway. No new PCT penalties are included in these attachments. References 1 through 6 provided annual 10 CFR 50.46 reports that were issued after the LOCA analyses were revised to reflect the installation of the replacement steam generators in 2005.

The PCT values determined in the Large Break and Small Break LOCA analyses of record, when combined with all PCT margin allocations, remain below the 2200°F regulatory limit. As such, no reanalysis is planned by Ameren Missouri.

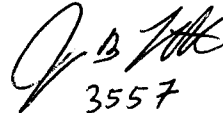
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This letter does not contain any new commitments. If you have any questions on this report, please contact Mr. Tom Elwood at (314) 225-1905.

Sincerely,



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For Scott A. Maglio  
Regulatory Affairs Manager

GGY/nls

Attachments: 1) Changes to the Westinghouse ECCS Evaluation Model and PCT Penalty Assessments  
2) ECCS Evaluation Model Margin Assessment for Callaway

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Attachment 1  
to ULNRC-05840

**ATTACHMENT ONE**

**CHANGES TO THE WESTINGHOUSE**

**ECCS EVALUATION MODEL**

**AND PCT PENALTY ASSESSMENTS**

**TABLE OF CONTENTS**

1. RADIATION HEAT TRANSFER LOGIC
2. MAXIMUM FUEL ROD TIME STEP LOGIC
3. GENERAL CODE MAINTENANCE

## **1. RADIATION HEAT TRANSFER LOGIC**

Two errors were discovered in the calculation of the radiation heat transfer coefficient in the SBLOCTA computer code. First, existing diagnostics did not preclude non-physical negative or large (negative or positive) radiation heat transfer coefficients from being calculated. These calculations occurred when the vapor temperature exceeded the cladding surface temperature or when the predicted temperature difference was less than 1 degree. Second, a temperature term incorrectly used degrees Fahrenheit instead of Rankine. These errors have been corrected in the SBLOCTA code and represent a closely related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

A combination of SBLOCTA sensitivity calculations performed by Westinghouse and their engineering judgment have resulted in an estimated PCT impact of 0°F for existing Small Break LOCA analysis results.

## **2. MAXIMUM FUEL ROD TIME STEP LOGIC**

An error was discovered in the SBLOCTA code that allowed the fuel rod time step to exceed the specified maximum allowable time step. The time step logic has been corrected in the SBLOCTA code. This error represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

A combination of SBLOCTA sensitivity calculations performed by Westinghouse and their engineering judgment have resulted in an estimated PCT impact of 0°F for existing Small Break LOCA analysis results.

## **3. GENERAL CODE MAINTENANCE**

Various changes have been made to enhance the usability of the codes and to help preclude errors in analyses. This includes items such as modifying input variable definitions, units, and defaults; improving the input diagnostic checks; enhancing the code output; optimizing active coding; and eliminating inactive coding. These changes have been evaluated for impact on existing Large Break and Small Break LOCA analysis results and they represent Discretionary Changes that will be implemented on a forward-fit basis in accordance with Section 4.1.1 of WCAP-13451.

Westinghouse has judged this issue to have an estimated PCT impact of 0°F on existing Large Break and Small Break LOCA analysis results.

Attachment 2  
to ULNRC-05840

**ATTACHMENT TWO**

**ECCS EVALUATION MODEL**

**MARGIN ASSESSMENT FOR CALLAWAY**



LARGE BREAK LOCA

A.	ANALYSIS OF RECORD (AOR)	PCT = 1939°F
B.	PRIOR ECCS MODEL ASSESSMENTS	+ 17°F
C.	CURRENT LOCA MODEL ASSESSMENTS - March 2012	+ 0°F

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LICENSING BASIS PCT + MARGIN ALLOCATIONS 1956°F

ABSOLUTE MAGNITUDE OF MARGIN ALLOCATIONS 17°F  
SINCE LAST LBLOCA 30-DAY REPORT

SMALL BREAK LOCA

A.	ANALYSIS OF RECORD (AOR)	PCT = 1043°F
B.	PRIOR ECCS MODEL ASSESSMENTS	+ 0°F
C.	CURRENT ECCS MODEL ASSESSMENTS - March 2012	+ 0°F

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LICENSING BASIS PCT + MARGIN ALLOCATIONS 1043°F

ABSOLUTE MAGNITUDE OF MARGIN ALLOCATIONS 0°F  
SINCE LAST SBLOCA 30-DAY REPORT