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RS-02-194

November 5, 2002

10 CFR 50.46

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

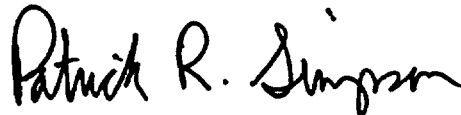
Clinton Power Station, Unit 1  
Facility Operating License No. NPF-62  
NRC Docket No. 50-461

**Subject:** Annual Report of Emergency Core Cooling System Evaluation Model Changes and Errors for Clinton Power Station

In accordance with 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," paragraph (a)(3)(ii), AmerGen Energy Company (AmerGen), LLC is submitting the annual report of the Emergency Core Cooling System (ECCS) Evaluation Model changes and errors for Clinton Power Station (CPS), Unit 1. This report covers the period from November 9, 2001 through November 5, 2002.

Should you have any questions concerning this letter, please contact Mr. Timothy A. Byam at (630) 657-2804.

Respectfully,



Patrick R. Simpson  
Manager – Licensing  
Mid-West Regional Operating Group

Attachment: Clinton Power Station, Unit 1, 10 CFR 50.46 Report

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Clinton Power Station

A001

**Attachment A**  
**Clinton Power Station, Unit 1**  
**10 CFR 50.46 Report**  
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PLANT NAME: Clinton Power Station, Unit 1  
 ECCS EVALUATION MODEL: SAFER/GESTR - LOCA  
 REPORT REVISION DATE: 11/05/02  
 CURRENT OPERATING CYCLE: 9

**ANALYSIS OF RECORD**

Evaluation Model Methodology: The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident; Volume III, SAFER/GESTR Application Methodology, NEDC-23785-1-PA, Revision 1, General Electric Company, October 1984.

Calculation: Clinton Power Station, SAFER/GESTR-LOCA Analysis Basis Documentation, NEDC-32974P, GE Nuclear Energy, October 2000.

Fuel: GE 10 and GE 14

Limiting Fuel: GE 14

Limiting Single Failure: High Pressure Core Spray (HPCS) Diesel Generator

Limiting Break Size and Location: 1.0 Double Ended Guillotine of Recirculation Pump Suction Piping

Reference Peak Cladding Temperature (PCT): 1550°F

**MARGIN ALLOCATION**

**A. PRIOR LOCA MODEL ASSESSMENTS**

10 CFR 50.46 report dated November 13, 2000 (See Note 1)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 08, 2001 (See Note 2)	$\Delta PCT = 5^\circ F$
<b>Net PCT</b>	<b>1555 °F</b>

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**B. CURRENT LOCA MODEL ASSESSMENTS**

Extended Power Uprate/Cycle 9 Reload (See Note 3)	$\Delta$ PCT = 20 °F
SAFER Core Spray Injection Elevation Error (See Note 4)	$\Delta$ PCT = 15 °F
GESTR Input File Interpolation Error (See Note 5)	$\Delta$ PCT = 0 °F
SAFER04 Computer Platform Change (See Note 6)	$\Delta$ PCT = 0 °F
WEVOL S1 Volume Error (See Note 7)	$\Delta$ PCT = 0 °F
LPCI/LPCS Minimum Flow Valve (See Note 8)	$\Delta$ PCT = 0 °F
<b>Net PCT</b>	<b>1590 °F</b>

Notes:

1. Prior LOCA Model Assessments

The referenced letter reported a new analysis of record for Clinton Power Station.

[Reference: Letter from M.A. Reandeau (AmerGen Energy Company) to U.S. NRC, "Report of a Change to the ECCS Evaluation Model Used for Clinton Power Station (CPS)," dated November 13, 2000.]

2. Prior LOCA Model Assessments

An inconsistent core exit steam flow was used in the pressure calculation in the SAFER code when there is a change in the two-phase level. The incorrect calculated pressure may result in premature termination of ECCS condensation and will impact the second PCT. GE evaluated the impact of this error and determined that the impact is an increase of 5 °F in the PCT. This error was reported to the NRC in the referenced letter.

[Reference: Letter from K.A. Ainger (Exelon Generation Company) to U.S. NRC, "Annual Report of Emergency Core Cooling System Evaluation Model Changes and Errors for Clinton Power Station," November 8, 2001.]

3. Current LOCA Model Assessments (Extended Power Uprate/Cycle 9 Reload)

The Extended Power Uprate (EPU) has resulted in an increase of 20 °F in the PCT. The EPU was implemented in Cycle 9 Reload.

[Reference: J11-03977SRLR-3473, Revision 0, "Supplemental Reload Licensing Report for Clinton Power Station Unit 1 Reload 8 Cycle 9 Power Uprate to 3473 MWth," February 2002]

4. Current LOCA Model Assessments (SAFER CS Injection Elevation Error)

GE reported an error in the automation code that prepares the input basedeck for the SAFER analysis. This error resulted in too low a value calculated for the lower Core Spray sparger injection elevation. GE evaluated the impact of this error and determined that the impact is an increase of 15 °F in the PCT.

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[Reference: 10 CFR 50.46 Notification Letter, 2002-01, Issued by Glen A. Watford.]

**5. Current LOCA Model Assessments (GESTR Input File Interpolation Error)**

GE reported an error in the initial gap conductance for cases at or beyond the knee in the Linear Heat Generation Rate (LHGR) curve. Due to this error, the initial gap conductance used in the SAFER calculations was slightly lower than it should have been. GE determined the PCT impact of this error to be 0 °F for GE 10 fuel. This error does not apply to the GE 14 fuel type.

[Reference: 10 CFR 50.46 Notification Letter, 2002-03, August 26, 2002.]

**6. Current LOCA Model Assessments (SAFER04 Computer Platform Change)**

GE reported that the LOCA evaluation code SAFER04 has been migrated from the VAX computer platform (SAFER04V) to the Alpha computer platform (SAFER04A). The change in computer platform may result in a change in the calculated PCT due to changes in the processor word size and FORTRAN compiler characteristics. GE determined that the PCT impact of this error to be 0 °F.

[Reference: 10 CFR 50.46 Notification Letter, 2002-04, August 26, 2002.]

**7. Current LOCA Model Assessments (WEVOL S1 Volume Error)**

GE reported that an error was found in the WEVOL code, which affects the calculated vessel volume in the downcomer region. The free volume in the region of the shroud head is calculated incorrectly. The code did not properly account for the volume of the standpipes inside the shroud head thickness. This resulted in the value for the free volume in the downcomer being too small. GE determined that the PCT impact of this error to be 0 °F.

[Reference: 10 CFR 50.46 Notification Letter, 2002-05, August 26, 2002.]

**8. Current LOCA Model Assessments (LPCI/LPCS Minimum Flow Valve)**

GE LOCA analysis for CPS does not explicitly account for the flow diverted by the Low Pressure Coolant Injection (LPCI) and Low Pressure Core Spray (LPCS) minimum flow valves (MFV) while they are open. An evaluation determined that the PCT impact due to the MFV flow diversion to be 0 °F for the limiting break.

[Reference: NFM-MW: 02-0291, "Operability Assessment of the LPCI/LPCS Minimum Flow Valve (MFV) Issue, OE # 14032 (CR # 116675)," July 31, 2002.]