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10 CFR 50.46

RS-04-066

May 5, 2004

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

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

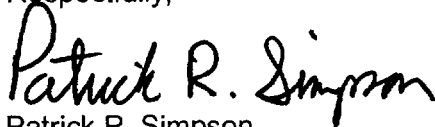
Subject: Transmittal of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," Annual Report for Quad Cities Nuclear Power Station, Units 1 and 2

Reference: Letter from T. J. Tulon (Exelon Generation Company, LLC) to U. S. NRC, "Transmittal of 10 CFR 50.46, 'Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors,' Annual Report for Quad Cities Nuclear Power Station, Units 1 and 2," SVP-03-063, dated May 8, 2003

The purpose of this letter is to provide the annual report required by 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," for Quad Cities Nuclear Power Station, Units 1 and 2. The attachments describe the changes in accumulated Peak Cladding Temperature (PCT) since the previous annual submittal (Reference).

Should you have any questions concerning this letter, please contact Mr. Thomas G. Roddey at (630) 657-2811.

Respectfully,



Patrick R. Simpson
Manager – Licensing

Attachments: Attachment A: Quad Cities Nuclear Power Station Unit 1, 10 CFR 50.46 Report
Attachment B: Quad Cities Nuclear Power Station Unit 2, 10 CFR 50.46 Report
Attachment C: Quad Cities Nuclear Power Station Units 1 and 2, 10 CFR 50.46 Report Assessment Notes

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

A001

Attachment A
Quad Cities Nuclear Power Station Unit 1
10 CFR 50.46 Report

PLANT NAME: Quad Cities Unit 1
 ECCS EVALUATION MODEL: SAFER/GESTR-LOCA
 REPORT REVISION DATE: 05/05/04
 CURRENT OPERATING CYCLE: 18A

ANALYSIS OF RECORD

Evaluation Model:

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

Calculations:

"SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis for Dresden Nuclear Station 2 and 3 and Quad Cities Nuclear Station Units 1 and 2," NEDC-32990P, Revision 2, GE Nuclear Energy, September 2003.

Fuel Analyzed in Calculation: GE9/10, ATRIUM-9B and GE14

Limiting Fuel Type: GE14

Limiting Single Failure: Diesel Generator

Limiting Break Size and Location: 1.0 Double-Ended Guillotine in a Recirculation Suction Pipe

Reference Peak Cladding Temperature (PCT)

PCT = 2110°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated December 6, 2002 (See Note 2)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 Report dated May 8, 2003 (See Note 4)	$\Delta PCT = 0^\circ F$
Net PCT	2110 °F

B. CURRENT LOCA MODEL ASSESSMENTS

SAFER Level/Volume Table Error (See Note 5)	$\Delta PCT = 0^\circ F$
Steam Separator Pressure Drop Error (See Note 6)	$\Delta PCT = 0^\circ F$
Mid-Cycle Reload of GE14 Fuel (See Note 7)	$\Delta PCT = 0^\circ F$
Total PCT change from current assessments	$\sum \Delta PCT = 0^\circ F$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0^\circ F$
Net PCT	2110 °F

Attachment B
Quad Cities Nuclear Power Station Unit 2
10 CFR 50.46 Report

PLANT NAME: Quad Cities Unit 2
 ECCS EVALUATION MODEL: SAFER/GESTR-LOCA
 REPORT REVISION DATE: 05/05/04
 CURRENT OPERATING CYCLE: 18

ANALYSIS OF RECORD

Evaluation Model:

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

Calculations:

"SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis for Dresden Nuclear Station 2 and 3 and Quad Cities Nuclear Station Units 1 and 2," NEDC-32990P, Revision 2, GE Nuclear Energy, September 2003.

Fuel Analyzed in Calculation: GE9/10, ATRIUM-9B and GE14

Limiting Fuel Type: GE14

Limiting Single Failure: Diesel Generator

Limiting Break Size and Location: 1.0 Double-Ended Guillotine in a Recirculation Suction Pipe

Reference Peak Cladding Temperature (PCT) PCT = 2110°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated March 28, 2002 (See Note 1)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 Report dated May 9, 2002 (See Note 3)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 Report dated May 8, 2003 (See Note 4)	$\Delta PCT = 0^\circ F$
Net PCT	2110°F

B. CURRENT LOCA MODEL ASSESSMENTS

SAFER Level/Volume Table Error (See Note 5)	$\Delta PCT = 0^\circ F$
Steam Separator Pressure Drop Error (See Note 6)	$\Delta PCT = 0^\circ F$
Second Reload of GE14 in Cycle 18 Core (See Note 8)	$\Delta PCT = 0^\circ F$
Total PCT change from current assessments	$\Sigma \Delta PCT = 0^\circ F$
Cumulative PCT change from current assessments	$\Sigma \Delta PCT = 0^\circ F$
Net PCT	2110°F

Attachment C
Quad Cities Nuclear Power Station Units 1 and 2
10 CFR 50.46 Report Assessment Notes

1. Prior LOCA Model Assessment

The 50.46 letter dated March 28, 2002 reported a new LOCA analysis to support extended power uprate (EPU) and transition to GE14 fuel for Quad Cities Unit 2.

[Reference: Letter from Timothy J. Tulon (Exelon) to U.S. NRC, "10 CFR 50.46, 30-Day Report for Quad Cities Unit 2," SVP-02-025, dated March 28, 2002.]

2. Prior LOCA Assessment

A new LOCA analysis was performed to support EPU and transition to GE14 fuel for Quad Cities Unit 1. In the referenced letter, the impact of CS and LPCI leakage, GE LOCA error in the WEVOL code and change in DG start time requirement were reported. There is no assessment penalty.

[Reference: Letter from Timothy J. Tulon (Exelon) to U.S. NRC, "10 CFR 50.46, 30-Day Report for Quad Cities Nuclear Power Station, Unit 1," SVP-02-104, dated December 6, 2002.]

3. Prior LOCA Assessment

In the referenced letter, no LOCA model assessment was reported for Unit 2 PCT.

[Reference: Letter from Timothy J. Tulon (Exelon) to U.S. NRC, "Transmittal of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light water nuclear power reactors," Annual Report for Quad Cities Units 1 and 2," SVP-02-039, dated May 9, 2002.]

4. Prior LOCA Assessment

The referenced letter provided the annual 50.46 report for Units 1 and 2. This letter reported no LOCA model assessment for Unit 1 whereas it reported the impact of GE LOCA error in the WEVOL code and change in DG start time requirement for Unit 2. The PCT impact for these errors was determined to be 0°F.

[Reference: Letter from Timothy J. Tulon (Exelon) to U.S. NRC, "Transmittal of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light water nuclear power reactors," Annual Report for Quad Cities Nuclear Power Station, Units 1 and 2," SVP-03-063, dated May 8, 2003.]

5. Current LOCA Assessment

GE reported that an error was found in the initial level/volume table for SAFER. The level/volume tables were generated with incorrect initial water levels. This resulted in an incorrect volume split in the nodes above and below the water surface, and incorrect initial liquid mass. GE determined that the PCT impact of this error on all fuel types to be negligible.

[Reference: GE Letter, "10 CFR 50.46 Notification Letter, " 2003-01, May 6, 2003.]

Attachment C
Quad Cities Nuclear Power Station Units 1 and 2
10 CFR 50.46 Report Assessment Notes

6. Current LOCA Assessment

GE reported that an error was found in the initial steam pressure drop input to the SAFER model. The calculation of this value for some plant/fuel types applied the wrong loss coefficient or erroneously included a term to account for the hydrostatic pressure. These errors resulted in a higher initial steam separator pressure drop and overly restricted the flow through the separator during the LOCA event. GE determined that the PCT impact of this error on all fuel types to be negligible.

[Reference: GE Letter, "10 CFR 50.46 Notification Letter," 2003-03, May 6, 2003.]

7. Current LOCA Assessment

Additional 233 new GE14 fuel bundles were introduced into the Quad Cities Unit 1 Cycle 18A core to replace the same number of ATRIUM-9B fuel bundles. GE evaluated this change and determined that the impact on the licensing basis PCT to be 0⁰F.

[Reference: Supplemental Reload Licensing Report for Quad Cities 1 Q1M16 Cycle 18A, 0000-0014-8357-SRLR, Revision 0, May 2003.]

8. Current LOCA Assessment

A second reload of GE14 fuel was introduced into the Quad Cities Unit 2 Cycle 18 core. GE evaluated this change and determined that the impact on the licensing basis PCT to be 0⁰F.

[Reference: Supplemental Reload Licensing Report for Quad Cities Unit 2 Reload 17 Cycle 18, 0000-0024-0751-SRLR, Revision 0, January 2004.]