

Exelon Generation Company, LLC
Dresden Nuclear Power Station
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10 CFR 50.46(a)(3)(ii)

October 30, 2009

SVPLTR: #09-0052

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

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Subject: Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report

References: (1) Letter from D. Wozniak (Exelon Generation Company, LLC) to U. S. NRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," dated October 31, 2008

In accordance with 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," paragraph (a)(3)(ii), Exelon Generation Company LLC, is submitting this letter and its attachment to meet the annual reporting requirements.

Dresden Nuclear Power Station (DNPS) has maintained the same emergency core cooling (ECCS) model as reported in Reference 1 for Unit 2 and Unit 3.

No vendor 10 CFR 50.46 LOCA model change/error notifications were received since the last annual report. The attachment provides the PCT value for each unit and the "rack-up" sheets for the LOCA analyses, along with assessment note summaries. An update to the value for vessel leakage between the shroud and downcomer results in a PCT impact of 0°F for GE14 fuel and 2°F for Optima2 fuel. This is discussed in the attachment and is expected to be implemented with revision 5 of the Westinghouse LOCA analysis following the Unit 2 core spray piping modification in November 2009.

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There are no regulatory commitments contained within this letter. If there are any questions concerning this letter, please contact Ms. Marri Marchionda, Regulatory Assurance Manager, at (815) 416-2800.

Respectfully,



Timothy K. Hanley
Site Vice President
Dresden Nuclear Power Station

Attachment: Dresden Nuclear Power Station Units 2 and 3 - 10 CFR 50.46 Report

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

DRESDEN NUCLEAR POWER STATION

UNITS 2 AND 3

10 CFR 50.46 REPORT

**Attachment
Dresden Nuclear Power Station Units 2 and 3
10CFR50.46 Report**

Unit 2 GE Fuel

PLANT NAME: Dresden Nuclear Power Station, Unit 2
 ECCS EVALUATION MODEL: SAFER/GESTR-LOCA
 REPORT REVISION DATE: 10/13/2009
 CURRENT OPERATING CYCLE: 21

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: 9x9-2, 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, 2001 (See Note 1)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 25, 2002 (See Note 2)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 25, 2003 (See Note 3)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 24, 2004 (See Note 4)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 16, 2005 (See Note 5)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 9, 2006 (See Note 6)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2007 (See Note 7)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2008 (See Note 9)	$\Delta PCT = 0^\circ F$
Net PCT	2110 °F

B. CURRENT LOCA MODEL ASSESSMENTS

Vessel Leakage Update (See Note 10)	$\Delta PCT = 0^\circ F$
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
Dresden Nuclear Power Station Units 2 and 3
10CFR50.46 Report**

Unit 2 Westinghouse Fuel

PLANT NAME: Dresden Nuclear Power Station, Unit 2
 ECCS EVALUATION MODEL: USA5
 REPORT REVISION DATE: 10/13/2009
 CURRENT OPERATING CYCLE: 21

ANALYSIS OF RECORD

Evaluation Model: "Westinghouse BWR ECCS Evaluation Model: Supplement 3 to Code Description, Qualification and Application to SVEA-96 Optima2 Fuel," WCAP-16078-P-A, November 2004.

Calculations:

"Dresden 2 & 3 LOCA Analysis for SVEA-96 Optima2 Fuel," OPTIMA2-TR021DR-LOCA, Revision 3, Westinghouse Electric Company LLC, June 2008.

Fuel Analyzed in Calculation: SVEA-96 Optima2
 Limiting Fuel Type: SVEA-96 Optima2
 Limiting Single Failure: LPCI injection valve
 Limiting Break Size and Location: 1.0 double-ended guillotine break in the recirculation pump suction line

Reference Peak Cladding Temperature (PCT) PCT = 2150°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated May 23, 2008 (See Note 8)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2008 (See Note 9)	$\Delta PCT = 0^\circ F$
Net PCT	2150°F

B. CURRENT LOCA MODEL ASSESSMENTS

Vessel Leakage Update (See Note 10)	$\Delta PCT = 2^\circ F$
Total PCT change from current assessments	$\Sigma \Delta PCT = 2^\circ F$
Cumulative PCT change from current assessments	$\Sigma \Delta PCT = 2^\circ F$
Net PCT	2152°F

**Attachment
Dresden Nuclear Power Station Units 2 and 3
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Unit 3 GE Fuel

PLANT NAME: Dresden Nuclear Power Station, Unit 3
 ECCS EVALUATION MODEL: SAFER/GESTR-LOCA
 REPORT REVISION DATE: 10/13/2009
 CURRENT OPERATING CYCLE: 21

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: 9x9-2, 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 November 25, 2002 (See Note 2)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 25, 2003 (See Note 3)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 24, 2004 (See Note 4)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 16, 2005 (See Note 5)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated November 9, 2006 (See Note 6)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2007 (See Note 7)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2008 (See Note 9)	$\Delta PCT = 0^\circ F$
Net PCT	2110 °F

B. CURRENT LOCA MODEL ASSESSMENTS

Vessel Leakage Update (See Note 10)	$\Delta PCT = 0^\circ F$
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
Dresden Nuclear Power Station Units 2 and 3
10CFR50.46 Report**

Unit 3 Westinghouse Fuel

PLANT NAME: Dresden Nuclear Power Station, Unit 3
 ECCS EVALUATION MODEL: USA5
 REPORT REVISION DATE: 10/13/2009
 CURRENT OPERATING CYCLE: 21

ANALYSIS OF RECORD

Evaluation Model: "Westinghouse BWR ECCS Evaluation Model: Supplement 3 to Code Description, Qualification and Application to SVEA-96 Optima2 Fuel," WCAP-16078-P-A, November 2004.

Calculations:

"Dresden 2 & 3 LOCA Analysis for SVEA-96 Optima2 Fuel," OPTIMA2-TR021DR-LOCA, Revision 3, Westinghouse Electric Company LLC, June 2008.

Fuel Analyzed in Calculation: SVEA-96 Optima2
 Limiting Fuel Type: SVEA-96 Optima2
 Limiting Single Failure: LPCI injection valve
 Limiting Break Size and Location: 1.0 double-ended guillotine break in the recirculation pump suction line

Reference Peak Cladding Temperature (PCT) PCT = 2150°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated October 31, 2007 (See Note 7)	$\Delta PCT = 0^\circ F$
10 CFR 50.46 report dated October 31, 2008 (See Note 9)	$\Delta PCT = 0^\circ F$
Net PCT	2150°F

B. CURRENT LOCA MODEL ASSESSMENTS

Vessel Leakage Update (See Note 10)	$\Delta PCT = 2^\circ F$
Total PCT change from current assessments	$\Sigma \Delta PCT = 2^\circ F$
Cumulative PCT change from current assessments	$\Sigma \Delta PCT = 2^\circ F$
Net PCT	2152°F

**Attachment
Dresden Nuclear Power Station Units 2 and 3
10CFR50.46 Report**

Report Assessment Notes

1. Prior LOCA Model Assessment

The 50.46 letter dated December 6, 2001 reported a new LOCA analysis to support extended power uprate (EPU) and transition to GE14 fuel for Dresden Unit 2 Cycle 18. The same report assessed impact of errors in Framatome ANP LOCA analysis model for Dresden Unit 3 Cycle 17 at pre-EPU power level.

[Reference: Letter from Preston Swafford (PSLTR: #01-0122) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," December 6, 2001.]

2. Prior LOCA Model Assessment

Unit 3 implemented GE LOCA analysis and GE14 fuel with Dresden Unit 3 Cycle 18 startup on October 25, 2002. Therefore, both Dresden Units 2 and 3 are being maintained under the same LOCA analysis. In the referenced letter, the impact of GE LOCA error in the WEVOL code was reported for Dresden Units 2 and 3 and determined to be negligible.

[Reference: Letter from Robert J. Hovey (RHLTR: #02-0083) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," November 25, 2002.]

3. Prior LOCA Model Assessment

The annual 50.46 report provided information on the LOCA model assessments for SAFER Level/Volume table error and Steam Separator pressure drop error. In the referenced letter, the impact of these two GE LOCA errors were reported to be negligible.

[Reference: Letter from Robert J. Hovey (RHLTR: #03-0077) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," November 25, 2003.]

4. Prior LOCA Model Assessment

The referenced annual 50.46 report provided information on reload of GE14 fuel for Dresden Unit 2 Cycle 19 and impact of postulated hydrogen-oxygen recombination on PCT. GE determined that there is no PCT impact because of the change due to the new reload of GE14 fuel and the postulated hydrogen –oxygen recombination.

[Reference: Letter from Danny Bost (SVPLTR: #04-0075) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," November 24, 2004.]

5. Prior LOCA Model Assessment

The referenced letter provided the annual 50.46 report for Units 2 and 3. The letter reported the PCT impact of reload of GE14 fuel for D3C19 starting on December 8, 2004. Also, the letter reported the GE LOCA evaluation for Unit 3, which implemented the lower sectional replacement and T-box clamp repairs. GE determined that there is

**Attachment
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Report Assessment Notes

no PCT impact because of the change due to the new reload of GE14 fuel and the lower sectional replacement and T-box clamp repairs.

[Reference: Letter from Danny Bost (SVPLTR: #05-0044) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," November 16, 2005.]

6. Prior LOCA Model Assessment

The referenced letter provided the annual 50.46 report for Units 2 and 3. The letter reported the PCT impact of the reload of GE14 fuel for D2C20. The letter also reported an evaluation of increased leakage of less than 5 gpm at runout condition in core spray line flow due to crack growth identified during D2R19 outage. Additionally, a GE evaluation of the small break for impact due to top-peak axial power shape was reported in this letter. The impact due to these changes on the licensing basis PCT was reported as zero.

[Reference: Letter from Danny Bost (SVPLTR: #06-0054) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," November 9, 2006.]

7. Prior LOCA Model Assessment

The referenced letter provided the annual 10 CFR 50.46 report for Units 2 and 3. The letter reported D3C20 startup with the first reload of Westinghouse Optima2 fuel and implementation of the Westinghouse LOCA analysis. No error was reported for GE LOCA applicable to operation of GE14 fuel in the Unit 2 core and unit 3 core.

[Reference: Letter from Danny Bost (SVPLTR: #07-0049) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," October 31, 2007.]

8. Prior LOCA Model Assessment

The referenced letter provided the 30-day 10 CFR 50.46 report for Dresden unit 2. The 30-day 10 CFR 50.46 report was submitted for Dresden unit 2 due to the non-conservative modeling of Low Pressure Core Spray (LPCS) performance for unit 2. Dresden unit 3 was not affected. Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limit reduction was implemented at Dresden unit 2 in order to meet all 10 CFR 50.46 criteria while maintaining a PCT at or below the licensing basis value of 2150 °F for the entire Cycle 21 operation.

[Reference: Letter from Jeffrey Hansen (RS-08-073) (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 30-Day Report for Fuel Type SVEA-96 Optima2," May 23, 2008.]

9. Prior LOCA Model Assessment

The referenced letter provided the annual 10 CFR 50.46 report for Units 2 and 3. The letter reported implementation of Westinghouse revised LOCA report to document evaluation of the non-conservative modeling of Low Pressure Core Spray (LPCS) performance for Unit 2. Dresden Unit 3 was not affected by this error.

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Dresden Nuclear Power Station Units 2 and 3
10CFR50.46 Report

Report Assessment Notes

[Reference: Letter from David Wozniak (SVPLTR: #08-0059 (Exelon) to USNRC, "Plant Specific ECCS Evaluation Changes – 10 CFR 50.46 Report," October 31, 2008.]

10. Current LOCA Model Assessment – Westinghouse has explicitly evaluated an update to the vessel leakage between the lower shroud and the downcomer and demonstrated that all 10 CFR 50.46 criteria are satisfied. This evaluation substantiates that maximum PCT impact due to the change in vessel leakage would be 2 °F for Optima2 fuel. Therefore, with a PCT impact of 2°F the licensing basis PCT for Optima2 fuel would remain at 2152 °F. The vessel leakage has been identified by GE for Dresden reactor internals evaluation to have an insignificant impact on the PCT transient portion of the LOCA event. Therefore, a PCT impact of 0°F is reported for GE14 fuel with the licensing basis PCT remaining at 2110 °F.

Note the referenced Westinghouse LOCA analysis is the latest revision containing the update to vessel leakage as well as evaluation of the Unit 2 core spray piping modification that is to be implemented during D2R21 outage in November 2009. This revision will be reported as the LOCA analysis of record for Dresden Optima2 fuel after implementation of the core spray piping with the 2010 annual letter. Revision 4 was not approved for use by Exelon as an error was identified during Exelon review, which resulted in issuance of Revision 5 by Westinghouse.

[References: OPTIMA2-TR021DR-LOCA, Revision 5, "Dresden 2 & 3 LOCA Analysis for SVEA-96 Optima2 Fuel," Westinghouse Electric Company, LLC. October 2009.

GE-NE-0000-0021-3568-01, "Reactor internals Leakage Evaluation Dresden Units 2 & 3 and Quad Cities 1 & 2," March 2009.]