

Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

RS-10-075
April 8, 2010

10 CFR 50.46

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

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Annual 10 CFR 50.46 Report of the Emergency Core Cooling System Evaluation Model Changes and Errors

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, (EGC) is submitting the attached information to fulfill the annual reporting requirements for Braidwood Station, Units 1 and 2 and Byron Station, Units 1 and 2.

Attachment 1 provides peak cladding temperature (PCT) information for the limiting loss-of-coolant accident (LOCA) evaluations for the Braidwood and Byron Stations. Attachment 2 contains the assessment notes, which provides a detailed description for each change reported. The Attachments indicate that there has been no net change in PCT for the Braidwood and Byron Stations with the exception of a 1°F increase in PCT for Byron Station, Unit 2.

There are no regulatory commitments contained in this letter. If you have any questions concerning this letter, please contact Ms. Lisa A. Schofield at (630) 657-2815.

Respectfully,



Patrick R. Simpson
Manager – Licensing
Exelon Generation Company, LLC

April 8, 2010
U. S. Nuclear Regulatory Commission
Page 2

Attachments:

- 1: Braidwood and Byron Stations, Units 1 and 2 – 10 CFR 50.46 Report
- 2: Braidwood and Byron Stations, Units 1 and 2 – 10 CFR 50.46 Report Assessment Notes

cc:

NRC Regional Administrator, Region III
NRC Senior Resident Inspector, Braidwood Station
NRC Senior Resident Inspector, Byron Station
NRR Project Manager, Braidwood and Byron Stations
Illinois Emergency Management Agency – Division of Nuclear Safety

**ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report**

PLANT NAME: Braidwood Station, Unit 1
 ECCS EVALUATION MODEL: Small Break Loss-of-Coolant Accident (SBLOCA)
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: A1C15

ANALYSIS OF RECORD

Evaluation Model: NOTRUMP
 Calculation: Westinghouse CN-LIS-00-208, December 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: 2" break in the bottom of the Cold Leg

**Reference Peak Cladding
 Temperature (PCT): 1624.0°F**

MARGIN ALLOCATION

A. PRIOR LOSS-OF-COOLANT ACCIDENT (LOCA) MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 35 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated November 19, 2007 (see note 10)	$\Delta PCT = 90 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT PCT = 1749.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

No 2009 model changes, corrections, or enhancements	$\Delta PCT = 0 \text{ }^\circ\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT PCT = 1749.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Braidwood Station, Unit 1
 ECCS EVALUATION MODEL: Large Break Loss-of-Coolant Accident (LBLOCA)
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: A1C15

ANALYSIS OF RECORD

Evaluation Model: CQD (1996)
 Calculation: Westinghouse CN-LIS-00-7, September 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: Guillotine break in the Cold Leg

Reference PCT: 2044.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 12\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 5\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 20\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated November 19, 2007 (see note 10)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 80\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in Metal Masses used from Drawings (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Gap Heat Transfer Logic (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Statistical Output Logic (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Braidwood Station, Unit 2
 ECCS EVALUATION MODEL: SBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: A2C15

ANALYSIS OF RECORD

Evaluation Model: NOTRUMP
 Calculation: Westinghouse CN-LIS-00-208, December 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: 2" break in the bottom of the Cold Leg

Reference PCT: 1627.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 3\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 35\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 90\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 1755.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

No 2009 model changes, corrections, or enhancements	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 1755.0°F

**ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report**

PLANT NAME: Braidwood Station, Unit 2
 ECCS EVALUATION MODEL: LBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: A2C15

ANALYSIS OF RECORD

Evaluation Model: CQD (1996)
 Calculation: Westinghouse CN-LIS-00-7, September 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: Guillotine break in the Cold Leg

Reference PCT: 2088.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 12\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 5\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 55\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 8\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2168.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in Metal Masses used from Drawings (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Gap Heat Transfer Logic (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Statistical Output Logic (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Braidwood 2 Cycle 15 PBOT/PMID violation (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2168.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 1
 ECCS EVALUATION MODEL: SBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: B1C17

ANALYSIS OF RECORD

Evaluation Model: NOTRUMP
 Calculation: Westinghouse CN-LIS-00-208, December 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: 2" break in the bottom of the Cold Leg

Reference PCT: 1624.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 35 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 90 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT

PCT = 1749.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

No 2009 model changes, corrections, or enhancements	$\Delta PCT = 0 \text{ }^\circ\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT

PCT = 1749.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 1
 ECCS EVALUATION MODEL: LBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: B1C17

ANALYSIS OF RECORD

Evaluation Model: CQD (1996)
 Calculation: Westinghouse CN-LIS-00-7, September 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: Guillotine break in the Cold Leg

Reference PCT: 2044.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 12\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 5\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 20\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 80\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in Metal Masses used from Drawings (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Gap Heat Transfer Logic (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Statistical Output Logic (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Byron 1 Cycle 17 PBOT/PMID violation (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 2
 ECCS EVALUATION MODEL: SBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: B2C16*
 *Cycle 16 to start May 2010

ANALYSIS OF RECORD

Evaluation Model: NOTRUMP
 Calculation: Westinghouse CN-LIS-00-208, December 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: 2" break in the bottom of the Cold Leg
 Reference PCT: **1627.0°F**

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 3 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 35 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated May 10, 2007 (see note 8)	$\Delta PCT = 90 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT

PCT = 1755.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

Maximum number of non-Uranium filler rods (see note 18)	$\Delta PCT = 0 \text{ }^\circ\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 0 \text{ }^\circ\text{F}$

Net PCT

PCT = 1755.0°F

ATTACHMENT 1
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 2
 ECCS EVALUATION MODEL: LBLOCA
 REPORT REVISION DATE: March 11, 2010
 CURRENT OPERATING CYCLE: B2C16*
 *Cycle 16 to start May 2010

ANALYSIS OF RECORD

Evaluation Model: CQD (1996)
 Calculation: Westinghouse CN-LIS-00-7, September 2000
 Fuel: VANTAGE+ 17 x 17
 Limiting Fuel Type: VANTAGE+ 17 x 17
 Limiting Single Failure: Loss of one train of ECCS flow
 Limiting Break Size and Location: Guillotine break in the Cold Leg

Reference PCT: 2088.0°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 report dated June 11, 2001 (see note 1)	$\Delta PCT = 12\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 18, 2002 (see note 2)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2003 (see note 3)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2004 (see note 4)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2005 (see note 5)	$\Delta PCT = 5\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 14, 2006 (see note 6)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 13, 2007 (see note 7)	$\Delta PCT = 8\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated May 10, 2007 (see note 8)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated June 22, 2007 (see note 9)	$\Delta PCT = 55\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 11, 2008 (see note 11)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
10 CFR 50.46 report dated April 9, 2009 (see note 12)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2168.0°F

B. CURRENT LOCA MODEL ASSESSMENTS

Maximum number of non-Uranium filler rods (see note 18)	$\Delta PCT = 1\text{ }^{\circ}\text{F}$
General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in Metal Masses used from Drawings (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Gap Heat Transfer Logic (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
HOTSPOT Statistical Output Logic (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Byron 2 Cycle 16 PBOT/PMID violation (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 1\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 1\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2169.0°F

ATTACHMENT 2
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

1. Prior Loss-of-Coolant Accident (LOCA) Model Assessment

The 10 CFR 50.46 report dated June 11, 2001, reported new large break loss-of-coolant accident (LBLOCA) and small break loss-of-coolant accident (SBLOCA) analyses to support operations at uprated power conditions. The same report assessed the impact from decay heat uncertainty error in Monte Carlo calculations on LBLOCA analysis, which resulted in a 12°F penalty, as applicable, and the impact from annular axial blankets on SBLOCA analysis, which resulted in a 3°F penalty, as applicable. Evaluations for plant conditions and LBLOCA and SBLOCA model changes that resulted in 0°F PCT change were reported. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

2. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 18, 2002, reported evaluations for LBLOCA and SBLOCA model changes, which resulted in 0°F PCT change. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

3. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 14, 2003, reported evaluations for LBLOCA and SBLOCA model changes which resulted in 0°F PCT change. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

4. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 14, 2004, reported evaluations for LBLOCA model changes, which resulted in 0°F PCT change. A SBLOCA assessment related to NOTRUMP bubble rise/drift flux model inconsistency corrections, which resulted in 35°F PCT assessment, was reported. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

5. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 14, 2005, reported evaluations for LBLOCA model changes, which resulted in a 5°F PCT change due to the Revised Blowdown Heatup Uncertainty Calculation. Assembly N10S was reconstituted with two stainless steel filler rods during Braidwood Unit 1 Refueling Outage 11. This assembly was reloaded into the core and used during Braidwood Unit 1 Cycle 12 operation. The introduction of up to five stainless steel filler rods was evaluated and shown to have no impact on LBLOCA and SBLOCA analyses. The estimated PCT effect was 0°F. This assembly was discharged during Reload 12. Cycle-specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

ATTACHMENT 2
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

6. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 14, 2006, reported evaluations for LBLOCA model changes, which resulted in a 0°F PCT change due to the Revised Iteration Algorithm for Calculating the Average Fuel Temperature, Pellet Radial Profile, Improved Automation of End of Blowdown Time, Thermodynamic Properties from THERMO, Vessel Unheated Conductor Noding and Containment Relative Humidity Assumption. NOTRUMP General Code Maintenance resulted in 0°F change for SBLOCA. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles.

7. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 13, 2007, reported evaluations for LOCA model changes and errors. The report documented general code maintenance for NOTRUMP, containment heat sink addition evaluation, AXIOM lead test assembly evaluation and NOTRUMP refined break spectrum, which resulted in 0°F PCT impact. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles, which resulted in an 8°F PCT for LBLOCA for Byron Unit 2.

8. Prior LOCA Model Assessment

The 30-day 10 CFR 50.46 report dated May 10, 2007, applicable to Byron Unit 2 reported an assessment of the Emergency Core Cooling System (ECCS), which evaluated changes in ECCS flow during the recirculation phase due to Generic Safety Issue (GSI) 191 related safety injection (SI) throttle valve replacements. The evaluation of recirculation phase ECCS flow changes relative to impact on the current Analysis of Record was performed for the SBLOCA and LBLOCA. The LBLOCA analysis was unaffected and a 0°F penalty was assessed. Based on the NOTRUMP and SBLOCA calculations performed for Byron Unit 2, a conservative, bounding PCT assessment of +90°F was applied to the current Byron Unit 2 SBLOCA PCT.

9. Prior LOCA Model Assessment

A 30-day report was submitted to the NRC dated June 22, 2007, to report an error in the HOTSPOT code, which resulted in an increase of 55°F in the LBLOCA PCT for Braidwood Unit 2 and Byron Unit 2 and a 20°F LBLOCA PCT increase for Braidwood Unit 1 and Byron Unit 1. In addition, the report also reported minor errors with the reactor vessel data collections that potentially affected the vessel inlet and outlet fluid volume, metal mass, and surface area. The corrected values were evaluated for impact, and a 0°F penalty was assessed for Byron Units 1 and 2, and Braidwood Units 1 and 2, SBLOCA analysis. The LBLOCA analyses were not affected by these minor errors.

ATTACHMENT 2
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

10. Prior LOCA Model Assessment

The 30-day 10 CFR 50.46 report dated November 19, 2007, applicable to Braidwood Unit 1 reported an assessment of the Emergency Core Cooling System (ECCS), which evaluated changes in ECCS flow during the recirculation phase due to GSI-191 related SI throttle valve replacements. The evaluation of recirculation phase ECCS flow changes relative to impact on the current Analysis of Record was performed for the SBLOCA and LBLOCA. The LBLOCA analysis was unaffected and a 0°F penalty was assessed. Based on the NOTRUMP and SBLOCA calculations performed for Braidwood Unit 1, a conservative, bounding PCT assessment of +90°F was applied to the current Braidwood Unit 1 SBLOCA PCT.

11. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 11, 2008, reported evaluations for LOCA model changes and errors. Applicable to Braidwood Unit 2 and Byron Unit 1, the ECCS assessment evaluated changes in ECCS flow during the recirculation phase due to GSI-191 related safety injection SI throttle valve replacements. A conservative, bounding PCT assessment of +90°F was applied to the Braidwood Unit 2 and Byron Unit 1 SBLOCA PCTs. The report also documented general code maintenance for SBLOCA and evaluation for pump weir resistance modeling for SBLOCA analyses, which resulted in 0 °F PCT impact. Cycle specific evaluations related to axial power shape distribution envelope violation were reported for the applicable operating cycles, which resulted in 8°F PCT for LBLOCA for Braidwood Unit 2 and 80°F PCT for LBLOCA for Byron Unit 1.

12. Prior LOCA Model Assessment

The 10 CFR 50.46 report dated April 9, 2009, reported evaluations for LOCA model changes and errors. The report documents general code maintenance for SBLOCA and LBLOCA, changes made to the HOTSPOT burst temperature logic errors (LBLOCA), errors in reactor vessel lower plenum surface area calculations (SBLOCA), discrepancies in metal mass from drawings (SBLOCA), a CCFL global volume error (LBLOCA), and an evaluation of Areva Lead Use Assemblies (LUA) (SBLOCA, LBLOCA). All have a 0°F PCT penalty associated with them.

Additionally, cycle specific evaluations related to axial power shape distribution envelope violation were performed for the applicable operating cycles, and an associated PCT penalty of 80°F was reported for the LBLOCA analysis for Braidwood 1 Cycle 15.

13. Axial Power Shape Distribution Envelope Violation (PMID, PBOT)

The LBLOCA analysis was performed based on assuming an axial power shape distribution envelope (PMID, PBOT), where PMID is the power in the middle one-third of the core; and PBOT is the power in the lower one-third of the core. The envelope is pertinent to the BELOCA analysis and is presented as Figure 11-1 of WCAP-15585, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Byron /Braidwood Units 1 and 2 Nuclear Plant," November 2000. For every reload cycle, the envelope is verified to remain limiting. If there is a violation, then a PCT penalty is calculated.

ATTACHMENT 2
Braidwood and Byron Stations, Units 1 and 2
10 CFR 50.46 Report Assessment Notes

For Byron Unit 1 Cycle 17, Byron Unit 2 Cycle 16, and Braidwood Unit 2 Cycle 15, there was a PBOT/PMID violation, and a PCT penalty of 0°F was calculated, which was previously reported to the NRC. The latest assessments for Byron Unit 1 Cycle 17, Byron Unit 2 Cycle 16, and Braidwood Unit 2 Cycle 15 do not affect the net PCT.

14. HOTSPOT Gap Heat Transfer Logic (LBLOCA)

The HOTSPOT code has been updated to incorporate the following changes to the gap heat transfer logic: (1) change the gap temperature from the pellet average temperature to the average of the pellet outer surface and cladding inner surface temperatures; (2) correct the calculation of the pellet surface emissivity to use a temperature in °R instead of °F; and (3) revise the calculation of the gap radiation heat transfer coefficient. The PCT impact due to these changes is 0°F.

15. HOTSPOT Statistical Output Logic (LBLOCA)

The HOTSPOT code has been updated to incorporate the following changes to the statistical output logic for calculations using the Code Qualification Document methodology: (1) revise one of the three methods for calculating the standard deviation of cladding temperature to correctly identify the bin containing the 97.5th percentile value; and (2) change the 50th, 95th and 97.5th percentile bin values from the lower end of the range to the upper end. The PCT impact due to these changes is 0°F.

16. Discrepancy in Metal Masses Used from Drawings (SBLOCA)

Discrepancies were discovered in the use of lower support plate (LSP) metal masses from drawings. The updated LSP metal masses have been evaluated, and the PCT impact due to this change on the SBLOCA has been determined to be 0°F.

17. General Code Maintenance (LBLOCA)

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. The nature of these changes leads to an estimated PCT impact of 0°F.

18. Maximum Number of Non-Uranium Filler Rods (SBLOCA and LBLOCA)

The Byron Unit 2 Cycle 16 design has a 1°F PCT penalty for LBLOCA and a 0°F penalty for SBLOCA with the use of sixteen (16) Non-Uranium Filler Rods. The 16 filler rods were evaluated as a contingency for the 16 AXIOM™ high burnup fuel rods. The PCT penalty is 0°F if eight or less filler rods are used in Byron Unit 2 Cycle 16.