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RS-09-051

10 CFR 50.46

April 9, 2009

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

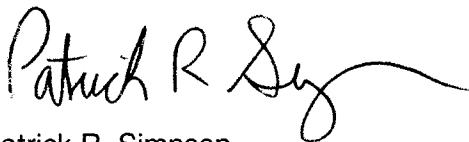
Subject: Annual 10 CFR 50.46 Report of the Emergency Core Cooling System Evaluation
Model Changes and Errors

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 updated information regarding the peak cladding temperature for the limiting small break and large break loss-of-coolant accident evaluations for the Braidwood and Byron Stations. Attachment 2 contains a detailed description and assessment for each change or error reported.

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

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

ATTACHMENT 1
Braidwood and Byron, 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 6, 2009
CURRENT OPERATING CYCLE: A1C15*
*Cycle 15 to start April 2009

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

Net PCT

PCT = 1749.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

Errors in reactor vessel lower plenum surface area calculations (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in metal masses used from drawings (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
AREVA Lead Use Assembly (see note 19)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
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, 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 6, 2009
CURRENT OPERATING CYCLE: A1C15*
*Cycle 15 to start April 2009

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)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2081.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

Axial power shape distribution envelope violation (see note 12)	$\Delta PCT = 80\text{ }^{\circ}\text{F}$
HOTSPOT burst temperature logic errors (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
CCFL global volume error (see note 18)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
AREVA Lead Use Assembly (see note 19)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Total PCT change from current assessments	$\sum \Delta PCT = 80\text{ }^{\circ}\text{F}$
Cumulative PCT change from current assessments	$\sum \Delta PCT = 80\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

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

PLANT NAME: Braidwood Station, Unit 2
ECCS EVALUATION MODEL: SBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: A2C14

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)	$\Delta PCT = 90\text{ }^{\circ}\text{F}$

Net PCT

PCT = 1755.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

Errors in reactor vessel lower plenum surface area calculations (see note 14)	$\Delta PCT = 0^{\circ}F$
Discrepancy in metal masses used from drawings (see note 15)	$\Delta PCT = 0^{\circ}F$
General code maintenance (see note 16)	$\Delta PCT = 0^{\circ}F$
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

PCT = 1755.0°F

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

PLANT NAME: Braidwood Station, Unit 2
ECCS EVALUATION MODEL: LBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: A2C14

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)	$\Delta PCT = 8\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2168.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

HOTSPOT burst temperature logic errors (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
CCFL global volume error (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 = 2168.0°F

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

PLANT NAME: Byron Station, Unit 1
ECCS EVALUATION MODEL: SBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: B1C16

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

Net PCT

PCT = 1749.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

Errors in reactor vessel lower plenum surface area calculations (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in metal masses used from drawings (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
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, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 1
ECCS EVALUATION MODEL: LBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: B1C16

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)	$\Delta PCT = 80\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2161.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

HOTSPOT burst temperature logic errors (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
CCFL global volume error (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 = 2161.0°F

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

PLANT NAME: Byron Station, Unit 2
ECCS EVALUATION MODEL: SBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: B2C15

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

Net PCT

PCT = 1755.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

Errors in reactor vessel lower plenum surface area calculations (see note 14)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
Discrepancy in metal masses used from drawings (see note 15)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 16)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
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, Units 1 and 2
10 CFR 50.46 Report

PLANT NAME: Byron Station, Unit 2
ECCS EVALUATION MODEL: LBLOCA
REPORT REVISION DATE: March 6, 2009
CURRENT OPERATING CYCLE: B2C15

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)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$

Net PCT

PCT = 2168.0°F

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

B. CURRENT LOCA MODEL ASSESSMENTS

HOTSPOT burst temperature logic errors (see note 13)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
General code maintenance (see note 17)	$\Delta PCT = 0\text{ }^{\circ}\text{F}$
CCFL global volume error (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 = 2168.0°F

ATTACHMENT 2
Braidwood and Byron, 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 and the impact from annular axial blankets on SBLOCA analysis. 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, 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.

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.

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

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

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 SBLOCTA 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.

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

The LBLOCA analysis is 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 Westinghouse verifies that the envelope remains limiting. If there is a violation then a PCT penalty is calculated.

For Braidwood Unit 1 Cycle 15, there was a violation and a PCT penalty of 80°F was calculated, which was first reported for Braidwood Unit 1 Cycle 11 in the 10 CFR 50.46 notification to the NRC, dated April 14, 2003. The assessment for the Braidwood Unit 1 Cycle 15 does not affect the net PCT.

13. HOTSPOT Burst Temperature Logic Errors (LBLOCA)

The HOTSPOT code has been updated to incorporate the following corrections to the burst temperature logic:

- (1) change the rod internal pressure used to calculate the cladding engineering hoop stress from the value in the previous time step to the value in the current time step;
- (2) revise the average cladding heatup rate calculation to reset selected variables to zero at the beginning of each trial and use the instantaneous heat-up rate when fewer than five values are available; and
- (3) reflect the assumed saturation of ramp rate effects above 28°C/s for Zircaloy-4 cladding. Sample calculations for each change showed no effect on PCT, leading to an estimated impact of 0°F.

ATTACHMENT 2
Braidwood and Byron, Units 1 and 2
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14. Errors in Reactor Vessel Lower Plenum Surface Area Calculations (SBLOCA)

Two errors were discovered in the calculations of reactor vessel lower plenum surface area. The differences are relatively minor and are expected to have a negligible effect on small break LOCA analysis results, leading to an estimated PCT impact of 0°F.

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

Discrepancies were discovered in the use of metal masses from drawings. The updated reactor vessel metal masses and fluid volumes have been evaluated. The differences in reactor vessel metal mass and fluid volume are relatively minor and would be expected to produce a negligible effect on small break LOCA analysis results, leading to an estimated PCT impact of 0°F.

16. General Code Maintenance (SBLOCA)

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.

17. General Code Maintenance (LBLOCA)

A number of coding changes were made as a part of normal code maintenance. Examples include additional information in code outputs, improved automation and diagnostics in the codes, increased code dimensions, and general code cleanup. The nature of these changes leads to an estimated PCT impact of 0°F.

18. CCFL Global Volume Error (LBLOCA)

An error was identified during the course of a recent Best Estimate LBLOCA analysis in which the volume between the core barrel and the baffle plates in the counter-current flow limiting (CCFL) region above the active fuel length was modeled incorrectly. The corrected values have been evaluated for impact on the current licensing-basis analysis results. The CCFL global volume modeling error has been evaluated to have a negligible impact on PCT for affected analyses and a penalty of 0°F is assigned.

19. AREVA Lead Use Assembly (LBLOCA and SBLOCA)

Eight AREVA Lead Use Assemblies (LUA) will be loaded into the Braidwood Unit 1 Cycle 15 core. AREVA has determined that an eight percent radial peaking penalty in the AREVA fuel assemblies relative to the co-resident Westinghouse fuel assures that the PCT of the LUAs will be less than that of the Westinghouse fuel. Westinghouse concluded that the LUAs have a negligible impact on the Westinghouse resident fuel and no Peak Cladding Temperature penalty is required. A penalty of 0°F is assigned.