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Serial: RA-19-0195  
April 10, 2019

10 CFR 52, Appendix D, X.B  
10 CFR 50.46

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

SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 2 AND 3  
DOCKET NOS. 52-022 AND 52-023

SUBJECT: AP1000 Combined License Application Departure Report Update and 10 CFR  
50.46 Annual Update

Duke Energy Progress, Inc. (DEP) submitted an application, dated February 18, 2008, for a combined license for two AP1000 advanced pressurized water reactors to be located at the Shearon Harris Nuclear Power Plant Site. Part 7 of the application is entitled "Departures and Exemption Requests." This letter provides an update to the report describing plant-specific departures from the AP1000 Design Control Document (i.e. Departures Report) as required by 10 CFR 52, Appendix D, paragraphs X.B.1 and X.B.3.b.

There have been no new departures or changes to the departures described in the Shearon Harris Nuclear Power Plant (HAR), Units 2 and 3, COLA Part 7, "Departures and Exemption Requests" for the period of November 1, 2018 to March 31, 2019.

In addition, this letter provides a required report in accordance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," for HAR.

A design certification holder is required to report to the NRC in accordance with 10 CFR 50.46(a)(3). This same regulation required a similar report from any combined license (COL) holder and COL applicant. The DEP COL application for HAR, Units 2 and 3, incorporates by reference the AP1000 design certification document and thus, also utilize the peak cladding temperature calculations performed by Westinghouse Electric Company (WEC). As such, the WEC report, provided in the Enclosure, is applicable to HAR Units 2 and 3.

This submittal contains no regulatory commitments.

U.S. Nuclear Regulatory Commission  
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Please address any comments or questions regarding this matter to Art Zaremba, Manager – Fleet Licensing at (980) 373-2062.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Nolan", written in a cursive style.

M. Christopher Nolan  
*Vice President, Nuclear Regulatory Affairs*

Enclosure:

Letter from Zachary S. Harper, Westinghouse Electric Company (WEC), to the U.S. Nuclear Regulatory Commission, 10 CFR 50.46 Annual Report for the AP1000 Plant Design, Letter No. DPC\_NRC\_000146, dated March 26, 2019.

cc: C. Haney, U.S. NRC Region II Administrator  
B. Hughes, U.S. NRC Project Manager

U.S. Nuclear Regulatory Commission  
RA-19-0195

**Enclosure**

Letter from Zachary S. Harper, Westinghouse Electric Company  
to the U.S. Nuclear Regulatory Commission  
10 CFR 50.46 Annual Report for the AP1000 Plant Design  
Letter No. DCP\_NRC\_000146, dated March 26, 2019



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Your Ref: Docket No. 52-006  
Our Ref: DCP\_NRC\_000146

March 26, 2019

**Subject: 10 CFR 50.46 Annual Report for the AP1000® Plant Design**

Pursuant to 10 CFR 50.46, “Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors”, Westinghouse Electric Company, LLC is submitting this report to document emergency core cooling system (ECCS) evaluation model changes or errors for the 2018 Model Year (i.e., 01/01/2018 – 12/31/2018) that affect the peak cladding temperature (PCT) calculations for the AP1000 plant design.

As described below, three AP1000 analyses of record (AORs) are reported:

AP1000 Design Certification AOR:

On December 30<sup>th</sup>, 2011, the U.S. Nuclear Regulatory Commission certified an amendment to the Design Certification Rule for the AP1000 plant. As such, AP1000 Design Control Document (DCD) Revision 19 documents the AOR for the AP1000 Design Certification. The limiting transient for the AP1000 Design Certification is the Best Estimate Large Break Loss-of-Coolant Accident (LBLOCA). Westinghouse last provided an annual reporting letter to the NRC in March, 2018 (DCP\_NRC\_003328) which presented an estimated PCT of 2010°F for the LBLOCA evaluation. There are no new ECCS model changes that impact PCT for the 2018 model year. The estimated PCT for LBLOCA remains at 2010°F and does not exceed the 10 CFR 50.46 (b)(1) acceptance criterion of 2200°F.

The summary of the PCT margin allocations and their bases for the AP1000 Design Certification AOR are provided in the Attachment 1.

AP1000 V.C. Summer Units 2 & 3 AOR:

In addition to the AOR for the AP1000 Design Certification, the NRC has approved the AP1000 Core Reference Report (WCAP-17524-P-A), a generic topical which includes an ECCS “reanalysis” in the context of 10 CFR 50.46. The AOR contained in the Core Reference Report (CRR) has also been approved for incorporation into the V.C. Summer Units 2 & 3 licenses via license amendment request (LAR). There are no new ECCS model changes that impact PCT for the 2018 model year. The estimated PCT for LBLOCA remains at 1970°F and does not exceed the 10 CFR 50.46 (b)(1) acceptance criterion of 2200°F.

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The summary of the PCT margin allocations and their bases for the AP1000 V.C. Summer Units 2 & 3 AOR are provided in the Attachment 2.

AP1000 Vogtle Units 3 & 4 AOR:

In addition to the AOR for the AP1000 Design Certification, the NRC has approved the AP1000 Core Reference Report (WCAP-17524-P-A), a generic topical which includes an ECCS “reanalysis” in the context of 10 CFR 50.46. The AOR contained in the Core Reference Report (CRR) has also been approved for incorporation into the Vogtle Units 3 & 4 licenses via NRC License Amendment 52. Additionally, changes as part of the containment pressure analysis included in LAR-17-043 have been approved for incorporation into the Vogtle Units 3&4 licenses via NRC License Amendments 147 (Unit 3) and 146 (Unit 4). As such, the estimated PCT for LBLOCA is 2024°F and does not exceed the 10 CFR 50.46 (b)(1) acceptance criterion of 2200°F.

The summary of the PCT margin allocations and their bases for the AP1000 Vogtle Units 3 & 4 AOR are provided in the Attachment 3.

By copy of this letter, COL Holders and COL Applicants are hereby notified of any changes or errors in the AP1000 standard plant design PCT calculations as required by 10 CFR 50.46(a)(3)(iii). This letter contains site-specific evaluations for V.C. Summer Units 2 & 3 and Vogtle Units 3 & 4.

Questions or requests for additional information related to content and preparation of this information should be directed to Westinghouse. Please send copies of such questions or requests to the respective COL Holders and COL Applicants referencing the amended AP1000 Design Certification Rule for the AP1000 nuclear power plant. A representative for each COL Holder and COL Applicant is included on the cc: list of this letter.

Very truly yours,



Zachary S. Harper  
Manager, AP1000 Licensing

/Attachments

1. 10 CFR 50.46 Annual Report for the AP1000 Design Certification AOR, 2018 Model Year
2. 10 CFR 50.46 Annual Report for the AP1000 V.C. Summer Units 2 & 3 AOR, 2018 Model Year
3. 10 CFR 50.46 Annual Report for the AP1000 Vogtle Units 3 & 4 AOR, 2018 Model Year

Cc:

J. Dixon-Herrity - U.S. NRC	A. Zaremba - Duke/Progress	A. Schoedel - Westinghouse
A. Bradford - U.S. NRC	S. Franzone - FP&L	M. Yuan - Westinghouse
D. Habib - U.S. NRC	R. Orthen - FP&L	D. McDevitt - Westinghouse
J. Bouknight - SCANA	L. Oriani - Westinghouse	M. Sheaffer - Westinghouse
A. Aughtman - SNC	D. Weaver - Westinghouse	M. Barca - Westinghouse
A. Chamberlain - SNC	J. Boyle - Westinghouse	M. Patterson - Westinghouse
E. Grant - SNC	J. Eisenhauer - Westinghouse	
Y. Arafeh - SNC	M. Corletti - Westinghouse	

Attachment 1

10 CFR 50.46 Annual Report for the AP1000 Design Certification AOR, 2018 Model Year

## UO<sub>2</sub> FUEL PELLETT HEAT CAPACITY

### Background

A typographical error was discovered in the implementation of the UO<sub>2</sub> fuel pellet heat capacity as described by Equation C-4 of WCAP-8301 [1] for fuel rod heat-up calculations within the Appendix K Large Break and Small Break LOCA evaluation models. The erroneous formulation results in an over-prediction of heat capacity that increases with fuel temperature. The corrected formulation results in a maximum decrease in heat capacity on the order of approximately 1.2% for existing analyses of record. This represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451 [2].

### Affected Evaluation Model(s)

1985 Westinghouse Advanced Plant Small Break LOCA Evaluation Model with NOTRUMP.

### Estimated Effect

The small over-prediction in UO<sub>2</sub> fuel pellet heat capacity has been evaluated to have a negligible effect on existing large and small break LOCA analysis results due to the small magnitude of the change, leading to an estimated PCT impact of 0°F.

### References

1. WCAP-8301, "LOCTA-IV Program: Loss-of-Coolant Transient Analysis," June 1974.
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.

## LOCA Peak Cladding Temperature (PCT) Summary

**Plant Name:** AP1000  
**Utility Name:** Westinghouse Nuclear Power Plants  
**EM:** ASTRUM (2004)  
**AOR Description:** Best Estimate Large Break  
**Summary Sheet Status:** DCD

	PCT (°F)	Reference #	Note #
<b>ANALYSIS-OF-RECORD</b>	1837	1	
	<b>Delta PCT</b>		<b>Reporting</b>
<b>ASSESSMENTS*</b>	<b>(°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>
1. Evaluation of Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	139	2	2012
2. Revised Heat Transfer Multiplier Distributions	11	3	2013
3. Error in Burst Strain Application	23	4	2013

**AOR + ASSESSMENTS** PCT = 2010.0 °F

\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

### REFERENCES

- 1 APP-GW-GL-700, Revision 19, "AP1000 Design Control Document," June 2011.
- 2 LTR-LIS-12-288, "Information Regarding the Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown Including Analysis Input Changes for AP1000 Large Break LOCA Analysis," June 2012.
- 3 LTR-LIS-13-357, "AP1000 Plant 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
- 4 LTR-LIS-14-41, "AP1000 Plant 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

### NOTES:

- (a) None



### LOCA Peak Cladding Temperature (PCT) Summary

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**Plant Name:** AP1000  
**Utility Name:** Westinghouse Nuclear Power Plants  
**EM:** NOTRUMP-AP  
**AOR Description:** Appendix K Small Break  
**Summary Sheet Status:** DCD

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	PCT (°F)	Reference #	Note #	
<b>ANALYSIS-OF-RECORD</b>	1370	1	(a)	
	<b>Delta PCT</b>			<b>Reporting</b>
<b>ASSESSMENTS*</b>	<b>(°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>	<b>Year**</b>
1. Adiabatic Heat-up Calculation	264	2	(a)	2010

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**AOR + ASSESSMENTS**                      **PCT = 1634.0 °F**

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\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

#### REFERENCES

- 1 APP-GW-GL-700, Revision 19, "AP1000 Design Control Document," June 2011.
- 2 LTR-LIS-10-373, "10 CFR 50.46 Report for the Evaluation of AP1000 SBLOCA 10-inch Transient Adiabatic Heat-up Calculation," June 2010.

#### NOTES:

- (a) This is an adiabatic heat-up calculated PCT.

Attachment 2

10 CFR 50.46 Annual Report for the AP1000 V.C. Summer Units 2 & 3 AOR, 2018 Model Year

## UO<sub>2</sub> FUEL PELLETT HEAT CAPACITY

### Background

A typographical error was discovered in the implementation of the UO<sub>2</sub> fuel pellet heat capacity as described by Equation C-4 of WCAP-8301 [1] for fuel rod heat-up calculations within the Appendix K Large Break and Small Break LOCA evaluation models. The erroneous formulation results in an over-prediction of heat capacity that increases with fuel temperature. The corrected formulation results in a maximum decrease in heat capacity on the order of approximately 1.2% for existing analyses of record. This represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451 [2].

### Affected Evaluation Model(s)

1985 Westinghouse Advanced Plant Small Break LOCA Evaluation Model with NOTRUMP.

### Estimated Effect

The small over-prediction in UO<sub>2</sub> fuel pellet heat capacity has been evaluated to have a negligible effect on existing large and small break LOCA analysis results due to the small magnitude of the change, leading to an estimated PCT impact of 0°F.

### References

1. WCAP-8301, "LOCTA-IV Program: Loss-of-Coolant Transient Analysis," June 1974.
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.

### LOCA Peak Cladding Temperature (PCT) Summary

**Plant Name:** V. C. Summer Unit 2 and Unit 3  
**Utility Name:** South Carolina Electric & Gas  
**EM:** ASTRUM (2004)  
**AOR Description:** Best Estimate Large Break  
**Summary Sheet Status:** Current

	PCT (°F)	Reference #	Note #	
<b>ANALYSIS-OF-RECORD</b>	1936	1	(a)	
	<b>Delta PCT</b>			<b>Reporting</b>
<b>ASSESSMENTS*</b>	<b>(°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>	<b>Year**</b>
1. Revised Heat Transfer Multiplier Distributions	11	2		2013
2. Error in Burst Strain Application	23	3		2013
<b>AOR + ASSESSMENTS</b>		<b>PCT = 1970.0 °F</b>		

\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

#### REFERENCES

- 1 WCAP-17524-P-A, Revision 1, "AP1000 Core Reference Report," May 2015.
- 2 LTR-LIS-13-357, "AP1000 Plant 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
- 3 LTR-LIS-14-41, "AP1000 Plant 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

#### NOTES:

- (a) Value contains 2°F bias for PCT sensitivity to PRHR isolation, per Reference 1 response to CRR-008, Table 2 and Table 15.6.5-8.

## LOCA Peak Cladding Temperature (PCT) Summary

**Plant Name:** V. C. Summer Unit 2 and Unit 3  
**Utility Name:** South Carolina Electric & Gas  
**EM:** NOTRUMP-AP  
**AOR Description:** Appendix K Small Break  
**Summary Sheet Status:** Current

	PCT (°F)	Reference #	Note #	
<b>ANALYSIS-OF-RECORD</b>	663.5	1		
	<b>Delta PCT</b>			<b>Reporting</b>
<b>ASSESSMENTS*</b>	<b>(°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>	<b>Year**</b>
1. NOTRUMP Bubble Rise/Drift Flux Model Inconsistencies	32	2		2014
2. LAR-114 Evaluation	13	3,4,5	(a)	2017
<b>AOR + ASSESSMENTS</b>	<b>PCT =</b>	<b>708.5 °F</b>		

\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

### REFERENCES

- 1 WCAP-17524-P-A, Revision 1, "AP1000 Core Reference Report," May 2015.
- 2 LTR-LIS-15-5, "Updates to the AP1000 Plant SBLOCA 10 CFR 50.46 PCT Rackups," January 2015.
- 3 LTR-LIS-16-144, "Update to the AP1000 Plant SBLOCA 10 CFR 50.46 PCT Rackups for LAR-114," January 2017.
- 4 LTR-LIS-18-53, "AP1000 Plant 10 CFR 50.46 Annual Notification and Reporting for 2017," March 2018.
- 5 NND-16-0336 (ML16246A214), "Automatic Depressurization System (ADS) Stage 2, 3 & 4 Valve Flow Area Changes and Clarifications," September 2016. Approved by NRC March 17, 2017 as Amendment 64 (ML17039B008/ML17039B058).

### NOTES:

- (a) The LAR-114 evaluation assesses the impact of reduced automatic depressurization system (ADS) Stage 2, 3, and 4 flow areas described in design change proposals (DCPs) 5051 and 5054.

Attachment 3

10 CFR 50.46 Annual Report for the AP1000 Vogtle Units 3 & 4 AOR, 2018 Model Year

## LARGE BREAK LOCA DESIGN CHANGE REBASELINE EVALUATION

### Background

Numerous AP1000<sup>®</sup> plant design changes have occurred since the AP1000 Core Reference Report large break loss-of-coolant accident (LBLOCA) analysis was performed [1]. The design changes impacting the LBLOCA analysis included numerous passive core cooling system (PXS), vessel model, containment pressure, reactor coolant system (RCS), and secondary system changes.

These items represent changes in plant configuration or associated set points, distinguished from an evaluation model change in Section 4 of WCAP-13451 [2].

### Affected Evaluation Model(s)

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

### Estimated Effect

An LBLOCA rebaseline evaluation was performed using the latest code versions with model corrections to determine an updated limiting peak cladding temperature (PCT) considering the AP1000 plant design changes up to May 5, 2014. The updated evaluation resulted in a PCT penalty of 54°F against the AP1000 plant Core Reference Report analysis [1].

### References

1. WCAP-17524-P-A, Revision 1, “AP1000 Core Reference Report,” May 2015.
2. WCAP-13451, “Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting,” October 1992.

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## SMALL BREAK LOCA DESIGN CHANGE REBASELINE ANALYSIS

### Background

Numerous AP1000<sup>®</sup> plant design changes have occurred since the AP1000 Core Reference Report small break loss-of-coolant accident (SBLOCA) analysis was performed [1]. The design changes impacting the SBLOCA analysis included numerous passive core cooling system (PXS), automatic depressurization system (ADS), reactor coolant system (RCS), containment pressure, and secondary system changes.

These items represent changes in plant configuration or associated set points, distinguished from an evaluation model change in Section 4 of WCAP-13451 [2].

### Affected Evaluation Model(s)

1985 Westinghouse Advanced Plant Small Break LOCA Evaluation Model with NOTRUMP.

### Estimated Effect

An SBLOCA rebaseline analysis was performed using the latest code versions with model corrections to determine an updated limiting peak cladding temperature (PCT) considering the AP1000 plant design changes up to August 4, 2014. The updated analysis resulted in a PCT penalty of 243.5°F against the AP1000 plant Core Reference Report analysis [1].

### References

1. WCAP-17524-P-A, Revision 1, "AP1000 Core Reference Report," May 2015.
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.

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## AP1000 PLANT LAR-133 EVALUATION

### Background

The design changes associated with License Amendment Request (LAR) 133 are changes to automatic depressurization system (ADS) Stages 1, 2, 3, and 4 line resistances and in-containment refueling water storage tank (IRWST) line resistances. These changes impact the AP1000® plant small break loss-of-coolant accident (SBLOCA) analysis. These items represent changes in plant configuration or associated set points, distinguished from an evaluation model change in Section 4 of WCAP-13451 [1].

### Affected Evaluation Model(s)

1985 Westinghouse Advanced Plant Small Break LOCA Evaluation Model with NOTRUMP.

### Estimated Effect

Updated SBLOCA calculations using the latest limiting SBLOCA transient have been performed to assess the impact of the changes to the ADS Stages 1 – 4 and IRWST injection line resistances associated with LAR-133. The updated calculations resulted in a 144°F PCT penalty, which is assessed against the AP1000 Core Reference Report analysis [2].

### References

1. WCAP-13451, “Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting,” October 1992.
2. WCAP-17524-P-A, Revision 1, “AP1000 Core Reference Report,” May 2015.

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## UO<sub>2</sub> FUEL PELLETT HEAT CAPACITY

### Background

A typographical error was discovered in the implementation of the UO<sub>2</sub> fuel pellet heat capacity as described by Equation C-4 of WCAP-8301 [1] for fuel rod heat-up calculations within the Appendix K Large Break and Small Break LOCA evaluation models. The erroneous formulation results in an over-prediction of heat capacity that increases with fuel temperature. The corrected formulation results in a maximum decrease in heat capacity on the order of approximately 1.2% for existing analyses of record. This represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451 [2].

### Affected Evaluation Model(s)

1985 Westinghouse Advanced Plant Small Break LOCA Evaluation Model with NOTRUMP.

### Estimated Effect

The small over-prediction in UO<sub>2</sub> fuel pellet heat capacity has been evaluated to have a negligible effect on existing large and small break LOCA analysis results due to the small magnitude of the change, leading to an estimated PCT impact of 0°F.

### References

1. WCAP-8301, "LOCTA-IV Program: Loss-of-Coolant Transient Analysis," June 1974.
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.

## LOCA Peak Cladding Temperature (PCT) Summary

**Plant Name:** Vogtle Unit 3 and Unit 4  
**Utility Name:** Southern Nuclear Operating Company  
**EM:** ASTRUM (2004)  
**AOR Description:** Best Estimate Large Break  
**Summary Sheet Status:** Current

	PCT (°F)	Reference #	Note #	
<b>ANALYSIS-OF-RECORD</b>	1936	1	(a)	
<b>ASSESSMENTS*</b>	<b>Delta PCT (°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>	<b>Reporting Year**</b>
1. Revised Heat Transfer Multiplier Distributions	11	2		2013
2. Error in Burst Strain Application	23	3		2013
3. Design Change Rebaseline Evaluation	54	4,5	(b)	2018

**AOR + ASSESSMENTS** PCT = 2024.0 °F

\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

### REFERENCES

- WCAP-17524-P-A, Revision 1, "AP1000 Core Reference Report," May 2015.
- LTR-LIS-13-357, "AP1000 Plant 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
- LTR-LIS-14-41, "AP1000 Plant 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.
- LTR-LIS-18-393, "Update to the Vogtle Units 3 & 4 LBLOCA and SBLOCA 10 CFR 50.46 PCT Summary Sheets for LAR-79," November 2018.
- ND-17-2074 (ML18029A243), "Containment Pressure Analysis (LAR-17-043)," December 2017. Approved by NRC November 7, 2018 as Amendments 147 (VEGP Unit 3) and 146 (VEGP Unit 4) (ML18289A742).

### NOTES:

- Value contains 2°F bias for PCT sensitivity to PRHR isolation, per Reference 1 response to CRR-008, Table 2 and Table 15.6.5-8.
- The design change rebaseline evaluation used current code versions and accounts for design changes up to May 5, 2014 and plant model error corrections.

## LOCA Peak Cladding Temperature (PCT) Summary

**Plant Name:** Vogtle Unit 3 and Unit 4  
**Utility Name:** Southern Nuclear Operating Company  
**EM:** NOTRUMP-AP  
**AOR Description:** Appendix K Small Break  
**Summary Sheet Status:** Current

	PCT (°F)	Reference #	Note #	
<b>ANALYSIS-OF-RECORD</b>	663.5	1		
	<b>Delta PCT</b>			<b>Reporting</b>
<b>ASSESSMENTS*</b>	<b>(°ΔF)</b>	<b>Reference #</b>	<b>Note #</b>	<b>Year**</b>
1. NOTRUMP Bubble Rise/Drift Flux Model Inconsistencies	32	2		2014
2. LAR-114 Evaluation	13	3,4,5	(a)	2016
3. LAR-133 Evaluation	144	6,7	(b)	2018
4. Design Change Rebaseline Analysis	243.5	8,9	(c)	2018
<b>AOR + ASSESSMENTS</b>		<b>PCT = 1096.0 °F</b>		

\* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

\*\* The "Reporting Year" refers to the annual reporting year in which this assessment was included.

## REFERENCES

- 1 WCAP-17524-P-A, Revision 1, "AP1000 Core Reference Report," May 2015.
- 2 LTR-LIS-15-5, "Updates to the AP1000 Plant SBLOCA 10 CFR 50.46 PCT Rackups," January 2015.
- 3 LTR-LIS-16-144, "Update to the AP1000 Plant SBLOCA 10 CFR 50.46 PCT Rackups for LAR-114," January 2017.
- 4 LTR-LIS-17-59, "AP1000 Plant 10 CFR 50.46 Annual Notification and Reporting for 2016," March 2017.
- 5 ND-16-0984 (ML16207A340), "Automatic Depressurization System (ADS) Stage 2, 3 & 4 Valve Flow Area Changes and Clarifications (LAR-16-012)," July 2016. Approved by NRC December 29, 2016 as Amendment 62 (ML16357A640).
- 6 LTR-LIS-16-429, "Update of the AP1000 Plant SBLOCA 10 CFR 50.46 PCT Rackups for LAR-133," January 2017.
- 7 ND-17-0443 (ML17090A209), "PXS/ADS Line Resistance Changes (LAR-17-009)," March 2017. Approved by NRC February 28, 2018 as Amendments 111 (VEGP Unit 3) and 110 (VEGP Unit 4) (ML18026A566/ML18026A571).
- 8 LTR-LIS-18-393, "Update to the Vogtle Units 3 & 4 LBLOCA and SBLOCA 10 CFR 50.46 PCT

Summary Sheets for LAR-79,” November 2018.

- 9 ND-17-2074 (ML18029A243), “Containment Pressure Analysis (LAR-17-043),” December 2017.  
Approved by NRC November 7, 2018 as Amendments 147 (VEGP Unit 3) and 146 (VEGP Unit 4)  
(ML18289A742).

**NOTES:**

- (a) The LAR-114 evaluation assesses the impact of reduced automatic depressurization system (ADS) Stage 2, 3, and 4 flow areas described in design change proposals (DCPs) 5051 and 5054.
- (b) The LAR-133 evaluation assesses the impact of updated ADS Stages 1 – 4 and In-Containment Refueling Water Storage Tank (IRWST) line resistances described in DCPs 4903 and 5138.
- (c) The design change rebaseline analysis used current code versions and accounts for design changes up to August 4, 2014 and plant model error corrections.