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SOUTHERN COMPANY
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2006

Ladies and Gentlemen:

Pursuant to the reporting requirements of 10 CFR 50.46 (a)(3)(ii), Southern Nuclear Operating Company (SNC) is submitting the emergency core cooling system (ECCS) evaluation model annual reports for Hatch Nuclear Plant Units 1 and 2, Farley Nuclear Plant Units 1 and 2, and Vogtle Electric Generating Plant Units 1 and 2.

These annual reports summarize the nature of and estimated effect of any changes or errors in the ECCS models for the period from January 1, 2006 through December 31, 2006.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

B. J. George
Manager, Nuclear Licensing

BJG/WAS/daj

Enclosures:
1. Edwin I. Hatch Nuclear Plant 10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006
2. Joseph M. Farley Nuclear Plant 10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006
3. Vogtle Electric Generating Plant 10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006

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**Enclosure 1**

**Edwin I. Hatch Nuclear Plant**
**10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006**

**Enclosure 1**
**Edwin I. Hatch Nuclear Plant**
**10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006**

## BACKGROUND

In accordance with 10 CFR 50.46(a)(3)(ii), this annual report summarizes the nature of and estimated effect of any changes or errors in the emergency core cooling system (ECCS) model for the period from January 1, 2006 through December 31, 2006 for Hatch Nuclear Plant Units 1 and 2.

## DISCUSSION

Updated limiting licensing basis peak clad temperatures (PCTs) applicable to Hatch are provided in the following table.

In 2006 Hatch Units 1 and 2 operated with both GE13 and GE14 fuel in their cores for at least part of the year. Therefore, the updated licensing basis PCTs are provided for both GE13 and GE14 fuel. The following table begins by listing the baseline ECCS-LOCA evaluations for GE13 fuel (Reference 1) and GE14 fuel (Reference 2).

The next section of the table lists the applicable changes or errors and their estimated effect on PCT that have previously been reported to the NRC (References 3, 4, 5, 6, 7, and 8).

The final section of the table lists those applicable changes or errors and their estimated effect on PCT during the period from January 1, 2006 through December 31, 2006. There have been no SNC changes to the ECCS model to report for 2006. There has been one GE 10 CFR 50.46 notification of changes or errors in 2006 for which additional information follows.

### Impact of Top Peaked Power Shape for Small Break LOCA Analysis on the PCT

In GE 10 CFR 50.46 Notification Letter 2006-01 (Reference 9), GE reported that for small break LOCA analyses a top-peaked axial power shape can result in higher calculated PCTs than the previously assumed mid-peaked axial power shape. The large break LOCA analyses are not significantly affected by the axial power shape assumption. The licensing basis PCTs for Hatch are based on the large break LOCA. Since the revised small break LOCA PCT remains below the large break LOCA PCT, GE reported the effect on PCT for Hatch to be 0 °F for GE13 and 0 °F for GE14.

## CONCLUSION

As documented in the following table, the updated Hatch limiting licensing basis PCTs for GE13 and GE14 remain in compliance with 10 CFR 50.46(b)(1), specifically requiring that the limiting licensing basis PCT shall not exceed 2200 °F. As such, there is no need for reanalysis or taking any other actions in accordance with 10 CFR 50.46(a)(3)(ii) because compliance with 10 CFR 50.46(b)(1) has been maintained.

## TABLE 1

### EDWIN I. HATCH NUCLEAR PLANT
### TOTAL RESULTANT PCT (°F)

| Report Period | Description of Change or Error in ECCS Evaluation | Estimated PCT Change ( °F) | | | | Updated PCT | |
|---|---|---|---|---|---|---|---|
| | | GE13 Fuel | | GE14 Fuel | | GE13 Fuel | GE14 Fuel |
| | | PCT Change | Absolute Value | PCT Change | Absolute Value | | |
| Baseline Evaluations | SAFER/ GESTR-LOCA Analysis dated March, 1997 (Ref. 1) | N/A | N/A | N/A | N/A | 1688 | N/A |
| | SAFER/ GESTR-LOCA Analysis dated March, 2002 (Ref. 2) | N/A | N/A | N/A | N/A | N/A | 1820 |
| Previously Reported Changes or Errors | Hatch 50.46 Annual Report for 2000 (Ref. 3) | 10 | 20 | N/A | N/A | 1698 | N/A |
| | Hatch 50.46 30 Day Report dated 5/21/01 (Ref. 4) | 100 | 100 | N/A | N/A | 1798 | N/A |
| | Hatch 50.46 Annual Report for 2002 (Ref. 5) | 15 | 15 | 0 | 0 | 1813 | 1820 |
| | Hatch 50.46 Annual Report for 2003 (Ref. 6) | 10 | 10 | -5 | 5 | 1823 | 1815 |
| | Hatch 50.46 Annual Report for 2004 (Ref. 7) | 0 | 0 | 0 | 0 | 1823 | 1815 |
| | Hatch 50.46 Annual Report for 2005 (Ref. 8) | N/A | N/A | N/A | N/A | 1823 | 1815 |
| 2006 Changes or Errors | GE 50.46 Notification Letter 2006-01 dated 7/28/06 (Ref. 9) | 0 | 0 | 0 | 0 | 1823 | 1815 |

## REFERENCES

1. NEDC-32720P, "Hatch Units 1 and 2 SAFER/GESTR Loss-of-Coolant Accident Analysis," dated March 1997.
2. GE-NE-0000-0000-9200-02P, "Hatch Units 1 and 2 ECCS-LOCA Evaluation for GE14," dated March 2002.
3. SNC Letter HL-6028, H. L. Sumner, Jr. to NRC, "Reporting of Changes and Errors in ECCS Evaluation Models," dated January 31, 2001.
4. SNC Letter HL-6090, H. L. Sumner, Jr. to NRC, "Reporting of Changes and Errors in ECCS Evaluation Models," dated May 21, 2001.
5. SNC Letter NL-03-0999, J. B. Beasley, Jr. to NRC, "10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2002," dated June 2, 2003.
6. SNC Letter NL-04-1042, L. M. Stinson to NRC, "10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2003," dated June 29, 2004.
7. SNC Letter NL-05-1050, H. L. Sumner, Jr. to NRC, "10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2004," dated June 25, 2005.
8. SNC Letter NL-06-2513, H. L. Sumner, Jr. to NRC, "10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2005," dated December 14, 2006.
9. Email from Andy Lingenfelter (GNF) to Ken S. Folk (SNC), "10 CFR 50.46 Notification – 2006-01 – Hatch," dated July 28, 2006.

# Enclosure 2

# Joseph M. Farley Nuclear Plant
# 10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006

**Enclosure 2**
**Joseph M. Farley Nuclear Plant**
**10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006**

## BACKGROUND

In accordance with 10 CFR 50.46(a)(3)(ii), this annual report summarizes the nature of and estimated effect of any changes or errors in the emergency core cooling system (ECCS) model for the period from January 1, 2006 through December 31, 2006 for Farley Nuclear Plant (FNP) Units 1 and 2.

## DISCUSSION

The following presents an assessment of the effects of errors and changes to the Westinghouse ECCS Evaluation Models on the FNP Units 1 and 2 loss of coolant accident (LOCA) analysis results since the 2005 annual report (Reference 1) for the calendar year 2006. This annual report has been prepared in accordance with the Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting (WCAP-13451, Reference 2), with the exception of plant changes. Starting in 2001, a change in the Westinghouse reporting methodology was made to include the 50.59 Plant Change PCT values as a part of the 50 °F error reporting section. The 2006 annual report (contained herein) is consistent with the change implemented in the 2001 annual report.

Unit 2 implemented the Reactor Internals Upflow Conversion Program (Reference 3) in 2002, and as such a new PCT rack-up reflecting the new upflow configuration analysis is presented here for Unit 2.

### Large-Break LOCA

Table 1A shows the LBLOCA PCT rack-ups for Unit 1 (Reference 4). Table 1B shows the LBLOCA PCT rack-ups for Unit 2 (Reference 4).

LBLOCA ECCS MODEL ANALYSIS-OF-RECORD

SNC has performed a reanalysis of the large-break LOCA PCT using the ASTRUM methodology. This new analysis was approved by the NRC for Farley in Amendments 174 for Unit 1 and 167 for Unit 2 issued on July 11, 2006. The large-break LOCA analyses for Farley Units 1 and 2 were examined to assess the effects of the changes and errors in the Westinghouse large-break LOCA ECCS Evaluation Model on PCT results.

The large-break LOCA analysis-of-record results for Farley Units 1 and 2 were calculated using Westinghouse's Best Estimate Evaluation Model (EM) (Reference 4). The Unit 1 and Unit 2 analyses assumed the following information important to the large-break LOCA in the Best Estimate Evaluation Model (EM) analysis (Reference 4). One analysis was used to bound both Farley Unit 1 and Unit 2.

- o 17x17 VANTAGE 5 Fuel Assembly
- o Core Power = 1.02 * 2775 MWT
- o Steam Generator Plugging Level = 10%
- o $F_Q = 2.50$
- o $F\Delta H = 1.70$

For Farley Units 1 and 2, the limiting size break analysis-of-record is a double-ended guillotine break at the pump discharge.

PRIOR LBLOCA ECCS MODEL ASSESSMENTS

Prior 10 CFR 50.46 Assessments Reported as Significant

None

Prior 10 CFR 50.59 Assessments

None

CURRENT LBLOCA ECCS MODEL ASSESSMENTS

The following changes and errors in the Westinghouse ECCS Evaluation Model would affect the Best Estimate Evaluation Model (EM).

Prior 10 CFR 50.46 Reported Assessments

None

2006 10 CFR 50.46 PCT Assessments

Quarterly Residual Heat Removal (RHR) Test Configuration Evaluation

RHR pump test procedures are performed quarterly for the Farley units. This test configuration results in a 25 °F PCT penalty during the time that the test is being performed due to the test line-up.

CURRENT PLANNED PLANT CHANGE EVALUATIONS

Starting with the 2001 annual report, the 10 CFR 50.59 Plant Change PCT values have been considered to be a part of the 50 °F error reporting section. The 2006 annual report (contained herein) is consistent with the changes implemented in the 2001 annual report.

Prior 10 CFR 50.59 Model Assessments

None

2006 Planned Plant Changes

None

TOTAL RESULTANT LBLOCA PCT

As discussed above, the changes and errors to the Westinghouse large-break LOCA ECCS Evaluation Model could affect the large-break LOCA analysis results by altering the PCT. As shown in Tables 1A and 1B, the large-break LOCA analysis PCT results for both units are below the 10 CFR 50.46 limit of 2200 °F.

## Small-Break LOCA

Table 2A shows the small-break LOCA PCT rack-ups for Unit 1. Table 2B shows the small-break LOCA PCT rack-ups for Unit 2.

SBLOCA ECCS MODEL ANALYSIS-OF-RECORD

The small-break LOCA analyses for Farley Units 1 and 2 were also examined to assess the effects of the changes and errors to the Westinghouse small-break LOCA ECCS Evaluation Models on PCT results. The small-break LOCA ECCS analysis results were calculated using the NOTRUMP small-break LOCA ECCS Evaluation Model (Reference 5). As noted earlier, the Unit 2 re-analysis reflects the Reactor Internals Upflow Conversion implemented in 2002 (Reference 3).

The Unit 1 and Unit 2 analyses assumed the following information important to the small-break LOCA analyses:

- o 17x17 VANTAGE+ Fuel Assembly
- o Core Power = 1.02 * 2775 MWT
- o Upflow Configuration
- o $F_Q$ = 2.50
- o $F\Delta H$ = 1.70

For Farley Units 1 and 2, the limiting size break analysis-of-record for the VANTAGE+ fuel analysis is a 3-inch diameter break in the cold leg. The limiting PCT values determined for the Unit 1 and Unit 2 17x17 VANTAGE+ small-break are shown in Table 2.

PRIOR SLBLOCA ECCS MODEL ASSESSMENTS

Prior 10 CFR 50.46 Assessments Reported as Significant

The following SBLOCA 10 CFR 50.46 assessment was reported in March 2000 as significant.

An overall PCT benefit of 62 °F for Unit 1 for the “Burst and Blockage/Time in Life” penalty resulted from the SPIKE computer code correlation revision (Reference 11).

Prior 10 CFR 50.59 Assessments

The following three plant change assessments were reported in the last submittal (Reference 1) and occurred prior to 2001.

The addition of permanent storage boxes in containment was evaluated and found not to cause a change to PCT (Reference 6).

The finalization of Replacement Steam Generator Data resulted in a 62 °F benefit for Unit 1 (Reference 10).

Annular pellets were determined to have a 10 °F penalty for SBLOCA results for Unit 1 (Reference 8).

Note that the Unit 2 result (in Table 2B) is unaffected by these prior 50.59 plant changes. The reason is that the Unit 2 Upflow Conversion implemented in 2002 required a small-break LOCA re-analysis that included the above changes explicitly.

## CURRENT SBLOCA ECCS MODEL ASSESSMENTS

The following changes and errors were identified:

### Prior 10 CFR 50.46 Reported Assessments

The following assessments were reported in the last PCT submittal (Reference 1).

NOTRUMP Mixture Level Tracking/Region Depletion Errors

Several closely related errors have been discovered in how NOTRUMP deals with the stack mixture level transition across a node boundary in a stack of fluid nodes. As previously reported, the impact of this revision on the SBLOCA results has been determined to be a 13 °F penalty for Unit 1. In addition, the associated change in Burst and Blockage/Time in Life Components was an additional 12 °F for Unit 1. Thus, the total change was 25 °F for Unit 1. This error does not impact Unit 2's re-analysis result (see previously discussed Reactor Internals Upflow Conversion), since the re-analysis was performed with the corrected version of NOTRUMP.

### 2006 10 CFR 50.46 PCT Assessments

None

## CURRENT PLANNED PLANT CHANGE EVALUATIONS

Starting with the 2001 annual report, the 10 CFR 50.59 Plant Change PCT values have been considered to be a part of the 50 °F error reporting section. The 2006 annual report (contained herein) is consistent with the change implemented in the 2001 annual report.

Prior 10 CFR 50.59 Model Assessments

None

2006 Planned Plant Changes

None

TOTAL RESULTANT SBLOCA PCT

As discussed above, the changes and errors in the Westinghouse small-break LOCA ECCS Evaluation Model could affect the small-break LOCA analysis results by altering the PCT. As shown in Tables 2A and 2B, the small-break LOCA analysis PCT results for both units are below the 10 CFR 50.46 limit of 2200 °F.

## CONCLUSION

As documented in the following tables, the updated Farley large-break and small-break LOCA analyses PCTs remain in compliance with 10 CFR 50.46(b)(1), specifically requiring that the PCT shall not exceed 2200 °F. As such, there is no need for reanalysis or taking any other actions in accordance with 10 CFR 50.46(a)(3)(ii) because compliance with 10 CFR 50.46(b)(1) has been maintained.

**TABLE 1A**
**JOSEPH M. FARLEY NUCLEAR PLANT – Unit 1**
**TOTAL RESULTANT LARGE-BREAK LOCA PCT (°F)**

| | |
|---|---|
| **A. LBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | **UNIT 1** |
| 1. ECCS Analysis | 1836* |
| Total Analysis-of-Record | 1836* |
| **B. PRIOR LBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. Prior 10 CFR 50.46 Assessments Reported as Significant | |
| A. None | 0 |
| 2. Prior 10 CFR 50.59 Assessments | |
| A. None | 0 |
| Sum of Prior Assessments | 0 |
| **C. CURRENT LBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. None | 0 |
| **D. CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| 1. Quarterly RHR Test Configuration Evaluation (Note 1) | 25** |
| **E. TOTAL RESULTANT LBLOCA PCT** | |
| **Total** | **1861** |

The PCT values are rounded up to the next highest integer number to avoid reporting in decimal points.

* See Reference 4
** See Reference 12

Note 1 – Assessment applies during quarterly RHR Pump Testing Configuration only.

**TABLE 1B**
**JOSEPH M. FARLEY NUCLEAR PLANT – Unit 2**
**TOTAL RESULTANT LARGE-BREAK LOCA PCT (°F)**

| | |
|---|---|
| **A. LBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | **UNIT 2** |
| 1. ECCS Analysis | 1836* |
| Total Analysis-of-Record | 1836* |
| **B. PRIOR LBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. Prior 10 CFR 50.46 Assessments Reported as Significant | |
| A. None | 0 |
| 2. Prior 10 CFR 50.59 Assessments | |
| A. None | 0 |
| Sum of Prior Assessments | 0 |
| **C. CURRENT LBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. None | 0 |
| **D. CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| 1. Quarterly RHR Test Configuration Evaluation (Note 1) | 25** |
| **E. TOTAL RESULTANT LBLOCA PCT** | |
| **Total** | **1861** |

The PCT values are rounded up to the next highest integer number to avoid reporting in decimal points.

* See Reference 4
** See Reference 12

Note 1 – Assessment applies during quarterly RHR Pump Testing Configuration only.

## TABLE 2A
## JOSEPH M. FARLEY NUCLEAR PLANT – Unit 1
## TOTAL RESULTANT SMALL-BREAK LOCA PCT (°F)

| | |
|---|---|
| **A. SBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | **UNIT 1** |
| 1. ECCS Analysis | 1883* |
| 2. Burst and Blockage / Time in Life | 137* |
| Total Analysis-of-Record | 2020* |
| **B. PRIOR SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. Prior 10 CFR 50.46 Assessments Reported as Significant | -62* |
| 2. Prior 10 CFR 50.59 Assessments | |
| A. Addition of Permanent Storage Boxes in Containment | 0* |
| B. Finalization of Replacement Steam Generator Data | -62# |
| C. Annular Pellet Blanket | 10* |
| Sum of Prior Assessments | -114* |
| **C. CURRENT SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. NOTRUMP Mixture Level Tracking / Region Depl Errors | 13* |
| 2. Associated change in Burst and Blockage | 12* |
| **D. CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| 1. None | 0 |
| **E. TOTAL RESULTANT SBLOCA PCT** | |
| **Total** | **1931*** |

The PCT values are rounded up to the next highest integer number to avoid reporting in decimal points.

* See References 1 and 4

# See Reference 10

**TABLE 2B**
**JOSEPH M. FARLEY NUCLEAR PLANT – Unit 2**
**TOTAL RESULTANT SMALL-BREAK LOCA PCT (°F)**

| | |
|---|---|
| **A. SBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | **UNIT 2** |
| 1. ECCS Analysis | 1868** |
| 2. Burst and Blockage / Time in Life | 120** |
| Total Analysis-of-Record | 1988* |
| **B. PRIOR SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. Prior 10 CFR 50.46 Assessments Reported as Significant | |
| A. None | 0 |
| 2. Prior 10 CFR 50.59 Assessments | |
| A. None | 0 |
| Sum of Prior Assessments | 0 |
| **C. CURRENT SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. None | **0 |
| **D. CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| 1. None | 0 |
| **E. TOTAL RESULTANT SBLOCA PCT** | |
| **Total** | **1988**** |

The PCT values are rounded up to the next highest integer number to avoid reporting in decimal points.

* See References 1 and 4

** The revised analysis-of-record reflects the Unit 2's conversion of downflow to upflow configuration (see References 1 and 3).

## REFERENCES

1. Letter from H. L. Sumner, Jr. to USNRC (NL-06-2513), "Edwin I. Hatch Nuclear Plant, Joseph M. Farley Nuclear Plant, Vogtle Electric Generating Plant 10 CFR 50.46 ECCS Evaluation Model Annual Reports for 2005," December 14, 2006.

2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.

3. ALA-02-039, "Transmittal of Reactor Internals Upflow Conversion Program Engineering Report, J. M. Farley Nuclear Plant Unit 2," June 2002 (also see WCAP-15974, November 2002).

4. LTR-LIS-07-891, "J. M. Farley Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2006," December 14, 2007.

5. "Westinghouse Small-break ECCS Evaluation Model Using the NOTRUMP Code," WCAP-10054-P-A (Proprietary), WCAP-10081-A (Non-Proprietary), Lee, N., et. al, August 1985.

6. SECL-97-062. Rev. 1, "Effects on LOCA PCT of Adding Permanent Storage Boxes and Lead Blankets Inside Containment," October 17, 1997.

7. ALA-00-037, "Final 10 CFR 50.46 Annual Notification and Reporting," March 8, 2000.

8. WCAP-15098, "Joseph M. Farley Nuclear Plant Units 1 and 2 RSG Program NSSS Licensing Report," November 1998.

9. ALA-01-008, "10 CFR 50.46 Annual Notification and Reporting for 2000," March 6, 2001.

10. ALA-01-01, "Southern Nuclear Operating Company, Joseph M. Farley Nuclear Plant Units 1 and 2, LBLOCA and SBLOCA Impacts Due to Final RSG Data for SGRP," February 11, 2000.

11. Letter from D. N. Morey to USNRC (NEL-00-0080), "Joseph M. Farley Nuclear Plant 10 CFR 50.46 Annual ECCS Evaluation Model Changes Report for 1999 and Significant Error Reports," March 29, 2000.

12. ALA-05-55, "Southern Nuclear Operating Company, Joseph M. Farley Nuclear Plant Units 1 and 2, Transmittal of Quarterly RHR Pump Testing Evaluation Revision 1," July 11, 2005

**Enclosure 3**

**Vogtle Electric Generating Plant**
**10 CFR 50.46 ECCS Evaluation Model Annual Report for 2006**

## BACKGROUND

In accordance with 10 CFR 50.46(a)(3)(ii), this annual report summarizes the nature of and estimated effect of any changes or errors in the emergency core cooling system (ECCS) model for the period from January 1, 2006 through December 31, 2006 for Vogtle Electric Generating Plant Units 1 and 2.

## DISCUSSION

The following presents an assessment of the effects of errors and changes to the Westinghouse ECCS Evaluation Models on the Vogtle Electric Generating Plant (VEGP) Units 1 and 2 loss of coolant accident (LOCA) analysis results since the 2005 annual report (Reference 10) for the calendar year 2006. This annual report has been prepared in accordance with the Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting (WCAP-13451, Reference 1), with the exception of plant changes. Starting in 2001, a change in the Westinghouse reporting methodology was made to include the 50.59 Plant Change PCT values as a part of the 50 °F error reporting section. The 2006 annual report (contained herein) is consistent with the change implemented in the 2001 annual report.

### Large-Break LOCA

Table 1A shows the LBLOCA PCT rack-ups for Unit 1. Table 1B shows the LBLOCA PCT rack-ups for Unit 2.

#### LBLOCA ECCS MODEL ANALYSIS-OF-RECORD

The large-break LOCA analyses for Vogtle Units 1 and 2 were examined to assess the effects of the changes and errors in the Westinghouse large-break LOCA ECCS Evaluation Model on PCT results.

In the Annual Report submitted on December 14, 2006 (Reference 10), SNC reported a LBLOCA PCT of 2062.1 $^{o}$F for both Unit 1 and Unit 2.

The large-break LOCA analysis was performed with the 1981 Version of the Westinghouse ECCS Evaluation Model using BASH (Reference 3) including changes in the methodology for execution of the model described in References 4 and 5, and the latest acceptable LOCBART model. The VEGP Unit 1 and Unit 2 analyses assumed the following information important to the large-break LOCA analyses:

- o 17x17 VANTAGE+ Fuel Assembly
- o Core Power = 1.02 * 3565 MWt
- o Vessel Average Temperature = 570.7 $^{o}$F
- o Steam Generator Plugging Level = 10%
- o $F_Q$ = 2.50
- o $F\Delta H$ = 1.65

For VEGP Units 1 and 2, the limiting size break continues to be the double-ended guillotine rupture of the cold leg piping with a discharge coefficient of $C_D$ = 0.6. The LBLOCA LOCBART analysis-of-record calculated PCT value is 2062.1 $^{o}$F for both Unit 1 and Unit 2.

<u>PRIOR LBLOCA ECCS MODEL ASSESSMENTS</u>

<u>Prior 10 CFR 50.46 Assessments Reported as Significant</u>

None

<u>Prior 10 CFR 50.59 Assessments</u>

None

<u>CURRENT LBLOCA ECCS MODEL ASSESSMENTS</u>

<u>Prior 10 CFR 50.46 Reported Assessments</u>

None

<u>2006 10 CFR 50.46 PCT Assessments</u>

None

CURRENT PLANNED PLANT CHANGE EVALUATIONS

Prior 10 CFR 50.59 Model Assessments

None

2006 Planned Plant Changes

None

TOTAL RESULTANT LBLOCA PCT

For Unit 1, the absolute sum of the LBLOCA PCT assessments is 0 $^{o}$F.

For Unit 2, the absolute sum of the LBLOCA PCT assessments is 0 $^{o}$F.

**Small-Break LOCA**

Table 2A shows the small-break LOCA PCT rack-ups for Unit 1. Table 2B shows the small-break LOCA PCT rack-ups for Unit 2.

SBLOCA ECCS MODEL ANALYSIS-OF-RECORD

In the Annual Report submitted on December 14, 2006 (Reference 10), SNC reported a SBLOCA PCT of 1138.0 $^{o}$F for both Unit 1 and Unit 2.

The small-break LOCA analysis was performed with the Westinghouse ECCS Evaluation Model using NOTRUMP (References 6 and 7), including changes to the methodology described in References 8 and 9, and the latest acceptable SBLOCTA model. The VEGP Unit 1 and Unit 2 analyses assumed the following information important to the small-break LOCA analyses:

- o 17x17 VANTAGE+ Fuel Assembly
- o Core Power = 1.02 * 3565 MWt
- o Vessel Average Temperature = 570.7 $^{o}$F
- o Steam Generator Plugging Level = 10%
- o $F_Q$ = 2.58
- o $F\Delta H$ = 1.70

For VEGP Units 1 and 2, the limiting size small-break continues to be a three-inch equivalent diameter break in the cold leg. The SBLOCA SBLOCTA analysis-of-record calculated PCT value is 1138.0 $^{o}$F for both Unit 1 and Unit 2.

PRIOR SLBLOCA ECCS MODEL ASSESSMENTS

Prior 10 CFR 50.46 Assessments Reported as Significant

None

Prior 10 CFR 50.59 Assessments

None

CURRENT SBLOCA ECCS MODEL ASSESSMENTS

Prior 10 CFR 50.46 Reported Assessments

None

2006 10 CFR 50.46 PCT Assessments

None

CURRENT PLANNED PLANT CHANGE EVALUATIONS

Prior 10 CFR 50.59 Model Assessments

None

2006 Planned Plant Changes

None

TOTAL RESULTANT SBLOCA PCT

For Unit 1, the absolute sum of the SBLOCA PCT assessments is 0 °F.

For Unit 2, the absolute sum of the SBLOCA PCT assessments is 0 °F.

**CONCLUSION**

As documented in the following tables, the updated VEGP large-break and small-break LOCA analyses PCTs remain in compliance with 10 CFR 50.46(b)(1), specifically requiring that the PCT shall not exceed 2200 °F. As such, there is no need for reanalysis or taking any other actions in accordance with 10 CFR 50.46(a)(3)(ii) because compliance with 10 CFR 50.46(b)(1) has been maintained.

## TABLE 1A
## VOGTLE ELECTRIC GENERATING PLANT
## TOTAL RESULTANT LARGE-BREAK LOCA PCT (°F) FOR UNIT 1

Based on the preceding discussions concerning the VEGP-specific application of the Westinghouse BASH large-break ECCS Evaluation Model, the licensing basis LBLOCA PCT is as follows:

| | | |
|---|---|---|
| **A.** | **LBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | |
| | 1. LOCBART Analysis Result (156 IFBA) | 2062.1 °F |
| **B.** | **PRIOR LBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. Combined assessments previously reported as significant | +0 °F |
| | 2. Combined planned plant change evaluations | +0 °F |
| **C.** | **CURRENT LBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. None | +0 °F |
| **D.** | **CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| | 1. None | +0 °F |
| **E.** | **TOTAL RESULTANT LBLOCA PCT** | |
| | **Total** | **2062.1 °F** |

**TABLE 1B**
**VOGTLE ELECTRIC GENERATING PLANT**
**TOTAL RESULTANT LARGE-BREAK LOCA PCT (°F) FOR UNIT 2**

Based on the preceding discussions concerning the VEGP-specific application of the Westinghouse BASH large-break ECCS Evaluation Model, the licensing basis LBLOCA PCT is as follows:

| | | |
|---|---|---|
| **A.** | **LBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | |
| | 1. LOCBART Analysis Result (156 IFBA) | 2062.1 °F |
| **B.** | **PRIOR LBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. Combined assessments previously reported as significant | +0 °F |
| | 2. Combined planned plant change evaluations | +0 °F |
| **C.** | **CURRENT LBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. None | +0 °F |
| **D.** | **CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| | 1. None | +0 °F |
| **E.** | **TOTAL RESULTANT LBLOCA PCT** | |
| | **Total** | **2062.1 °F** |

## TABLE 2A
## VOGTLE ELECTRIC GENERATING PLANT
## TOTAL RESULTANT SMALL-BREAK LOCA PCT (°F) FOR UNIT 1

Based on the preceding discussions concerning the VEGP-specific application of the Westinghouse NOTRUMP small-break ECCS Evaluation Model, the licensing basis SBLOCA PCT is as follows:

| | |
|---|---|
| **A. SBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | |
| 1. SBLOCTA Analysis Result | 1138.0 °F |
| **B. PRIOR SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. Combined assessments previously reported as significant | +0 °F |
| 2. Combined planned plant change evaluations | +0 °F |
| **C. CURRENT SBLOCA ECCS MODEL ASSESSMENTS** | |
| 1. None | +0 °F |
| **D. CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| 1. None | +0 °F |
| **E. TOTAL RESULTANT SBLOCA PCT** | |
| **Total** | **1138.0 °F** |

## TABLE 2B
## VOGTLE ELECTRIC GENERATING PLANT
## TOTAL RESULTANT SMALL-BREAK LOCA PCT (°F) FOR UNIT 2

Based on the preceding discussions concerning the VEGP-specific application of the Westinghouse NOTRUMP small-break ECCS Evaluation Model, the licensing basis SBLOCA PCT is as follows:

| | | |
|---|---|---|
| **A.** | **SBLOCA ECCS MODEL ANALYSIS-OF-RECORD** | |
| | 1. SBLOCTA Analysis Result | 1138.0 °F |
| **B.** | **PRIOR SBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. Combined assessments previously reported as significant | +0 °F |
| | 2. Combined planned plant change evaluations | +0 °F |
| **C.** | **CURRENT SBLOCA ECCS MODEL ASSESSMENTS** | |
| | 1. None | +0 °F |
| **D.** | **CURRENT PLANNED PLANT CHANGE EVALUATIONS** | |
| | 1. None | +0 °F |
| **E.** | **TOTAL RESULTANT SBLOCA PCT** | |
| | **Total** | **1138.0 °F** |

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