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A SCANA COMPANY

November 24, 2014
RC-14-0188

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

Dear Sir/Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
SOUTH CAROLINA ELECTRIC & GAS (SCE&G) CLARIFICATION TO RECOMMENDATION 2.1, FLOODING REEVALUATION SUBMITTAL

References:

1. NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012 [ML12053A340]
2. SCE&G to NRC, Flooding Reevaluation Results for Virgil C. Summer Unit 1 dated March 12, 2013 [ML13073A117]
3. Letter from Shawn Williams to Thomas D. Gatlin dated January 30, 2014, Virgil C. Summer Nuclear Station, Unit 1 (VCSNS) - Request for Additional Information (TAC NO. MF1112) [ML14023A740]
4. SCE&G to NRC, Response to NRC Request for Additional Information Associated With Near-Term Task Force Recommendation 2.1, Flooding Reevaluation, dated March 26, 2014 [ML14093A320]

On March 12, 2012, the NRC issued Reference 1 to all power reactor licensees and holders of construction permits which are either active or deferred status. Enclosure 2 of Reference 1 contains specific Requested Actions, Requested Information, and Required Responses associated with Recommendation 2.1: Flooding Reevaluation. In response to this request, South Carolina Electric & Gas (SCE&G) provided a Flood Hazard Analysis Reevaluation Report (Reference 2). The NRC Staff reviewed SCE&G's response in Reference 2 and determined that additional information was necessary (Reference 3). SCE&G provided a response (Reference 4) to Reference 3 and the NRC Staff has requested additional clarification. SCE&G, acting for itself and as agent for South Carolina Public Service Authority submits Enclosure I to provide clarification to Reference 4.

A010
NRR

This letter contains no new regulatory commitments.

Should you have any questions concerning the content of this letter, please contact Bruce L. Thompson at (803) 931-5042.

I declare under penalty of perjury that the foregoing is true and correct.

11/24/14
Executed on

Wayne D. Gatlin for
Thomas D. Gatlin

BJD/TDG/wt

Enclosure:
I. SCE&G Clarification to Recommendation 2.1 Flooding Reevaluation Submittal

c: Without enclosure unless noted
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PRSF (RC-14-0188)

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1

ENCLOSURE I

SCE&G Clarification to Recommendation 2.1 Flooding Reevaluation Submittal

As documented in Reference 4, VCSNS's original interpretation of the Trigger Letter (Reference 3) screened the site into Scenario 2. Since the original Flooding Hazard Reevaluation Report (FHRR) submittal, VCSNS has concluded that the site also screens in under Scenario 3 for river and stream flooding.

When the site submitted the FHRR, the original conclusion was the site screened in for the Local Intense Precipitation (LIP) event only, or Scenario 2. For the LIP event, the site relies on flood protection features (i.e. sandbags, door bulkheads) which are not permanently installed to cope with the LIP event. The calculated Probable Maximum Flood (PMF) elevation in the adjacent Monticello reservoir in the FHRR was slightly higher than the Current Licensing Basis (CLB)/Current Design Basis (CDB)* PMF level in the reservoir.

The initial VCSNS interpretation was that the site did not screen into the integrated assessment for rivers and stream flooding. This interpretation was based on the earthen berm (which protects the site) continuing to provide necessary protection, with available physical margin, for both the CLB/CDB PMF as well as the PMF calculated in the FHRR. The earthern berm provides permanently installed and passive flood protection against the PMF flood levels in the adjacent reservoir, therefore the site also screens in for Scenario 3.

The integrated assessment the site will be performing is based on Section 6 of the integrated assessment ISG and will include appropriate considerations described in Appendix A to the integrated assessment ISG and present-day codes and standards (Reference 2).

The below responses to RAI 3 and RAI 5 supersede the responses previously provided in Reference 13.

RAI No.3 - Streams and Rivers Flooding

Background: Given the significant role that Frees Creek/Monticello Reservoir plays in the licensee's analysis of the PMF from rivers and streams and the need to review the formulation of the model's complex spatially and temporally distributed input, the staff requests that the licensee provide a detailed description of the analysis it completed to support its conclusions.

Request: Provide detailed information and model inputs, if applicable, to support the conclusion in the FHRR related to the estimation of flooding due to the PMF event on Frees Creek/Monticello Reservoir (including wind and wave effects).

* The information referred to in this submittal as the CLB is synonymous to the CDB as this information is contained in the UFSAR as well as the original Safety Evaluation Report

SCE&G Response RAI-3
Calculation DC-02060-007, Revision 0 and Calculation DC02060-008, Revision 0 are provided in their entirety on the VCSNS Fukushima E-Portal. Below is a summary of information contained within Calculation DC-02060-007, Revision 0 and Calculation DC02060-008, Revision 0.

Calculation DC-02060-007, Revision 0, determined the Probable Maximum Precipitation (PMP) depth from the guidelines outlined in Section 4.4.3.3 of HMR 52 (Reference 2 of Calculation DC-02060-007, Revision 0) and Figures 18 through 27 of HMR 51 (Reference 3 of Calculation DC-02060-007, Revision 0). The tributary area (Figure 1 on page 6 of 16) to Frees Creek/Monticello Reservoir consists of a 16.5016-mi^2 drainage area. The PMP to be used in PMF calculation was determined to be the 72-hour PMP for the Monticello Reservoir watershed and equal to 47.7 inches (page 4 of 16).

Calculation DC02060-008, Revision 0, determined the PMF water levels in Monticello Reservoir. Model input and starting conditions used were:

- Starting water level was assumed to be 425.0 feet (maximum operating level controlled by Fairfield Pumped Storage Facility) (page 6 of 27).
- No discharge from reservoir during model run duration therefore no reservoir routing required (page 6 of 27).
- 72-hour PMP applied to tributary area. Upland tributary area runoff factored by NRCS TR-55 Curve Numbers conservatively selected. Total PMP = 47.7 inches. Factored runoff = 46.73 inches (page 6 of 27).
- Resulting still water surface elevation determined to be 431.07 feet (page 7 of 27).
- Wind effective fetch length determined to be 15,579 feet (2.95 miles) (page 8 of 27).
- Alternative I, Section 9.2.1.1 of ANSI/ANS-2.8-1992, Figure 3, the annual, extreme-mile, 2-year wind speed at Monticello Reservoir is 50 mph with average duration of 72 seconds (pages 9-10 of 27).
- Wave heights, spectral periods, runup, and setup determined by using methodology in EM 1110-2-1100 (pages 11-19 of 27). For the North Berm, the wave runup and wind setup values were determined to be 5.79 feet and 0.14 feet, respectively. For the Service Water Pond North Dam, the wave runup and wind setup values were determined to be 3.56 feet and 0.14 feet, respectively.
- The PMF elevation for Monticello Reservoir at the North Berm was determined to be 437.00 feet (page 18 of 27).
- The PMF elevation for Monticello Reservoir at the North Dam (SWP) was determined to be 434.77 feet (page 19 of 27).

RAI No. 5 - Streams and Rivers Flooding

Background: Given the significant role that the SWP has in the licensee's analysis of the PMF from rivers and streams and the need to review the formulation of the model's complex spatially and temporally distributed input, the staff requests that the licensee provide a detailed description of the analysis it completed to support its conclusions.

* The information referred to in this submittal as the CLB is synonymous to the CDB as this information is contained in the UFSAR as well as the original Safety Evaluation Report

Request: Provide detailed information and model inputs, if applicable, to support the conclusion in the FHRR related to the estimation of flooding due to the PMP (including wind effects) event on the SWP.

SCE&G Response RAI-5

Calculation DC02060-005, Revision 0 and Calculation DC02060-008, Revision 0 are provided in their entirety on the VCSNS Fukushima E-Portal. Below is a summary of information contained within Calculation DC02060-005, Revision 0 and Calculation DC02060-008, Revision 0.

Calculation DC02060-005, Revision 0, determined the water levels in the SWP resulting from the PMP on the site plus the SWP area. Model input and starting conditions used were:

- Starting water level was assumed to be 422.0 feet per Figure 15 (page 19 of 34).
- No discharge from SWP during model run duration therefore no reservoir routing required (Calculation DC02060-008, page 6 of 27).
- One-hour PMP and 6-hour PMP from the current licensing basis (CLB)* were applied to tributary area in separate Simulation runs. Upland tributary areas runoff factored by rational coefficients conservatively selected.
  Total 1 hr PMP = 19.0 inches, 6-hour PMP = 29.83 inches (page 13 of 34)
- Resulting still water surface elevations determined to be (page 17 of 34).

Table 1 - FLO-2D Maximum Water Surface Elevation Results

Simulation	Flood Routing Type	Max WSE @ Power Block		SWP WSE
1	Base case, 1 Hour PMP	437.5 ft. West side	436.6 ft. East side	426.3 ft
2	6 Hour CLB* PMP	437.4 ft. West side	436.5 ft. East side	430.2 ft

Calculation DC02060-008, Revision 0, determined the water levels in the SWP resulting from the PMP on the site plus the SWP area including wind generated waves, setup, and runup. Model input and starting conditions used were:

- The FLO-2D simulation results show the SWP maximum water surface elevation will be 426.3 feet (NGVD 29) from the 1 hour PMP (page 19 of 27).
- Wind effective fetch length determined to be 1,288 feet (0.24 miles) (page 19 of 27).
- Alternative I, Section 9.2.1.1 of ANSI/ANS-2.8-1992, Figure 3, the annual, extreme-mile, 2-year wind speed at Monticello Reservoir is 80 mph with average duration of 30 minutes (1800 seconds) (pages 20-24 of 27).
- Wave heights, spectral periods, runup, and setup determined by using methodology in EM 1110-2-1100 (pages 21-27 of 27). The wave runup and wind setup values were determined to be 1.71 feet and 0.09 feet, respectively.
- The PMF elevation for SWP at the West Embankment was determined to be 428.30 feet (page 27 of 27).

* The information referred to in this submittal as the CLB is synonymous to the CDB as this information is contained in the UFSAR as well as the original Safety Evaluation Report

References:

1. NRC Letter, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," March 12, 2012 [ML12053A340]

2. NRC Japan Lessons-Learned Project Directorate, JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding," Revision 0, November 30, 2012 [ML12311A214]

3. NRC Letter, D.L. Skeen (NRC) to J.E. Pollock (NEI), "Trigger Conditions for Performing an Integrated Assessment and Due Date for Response," December 3, 2012 [ML12326A912]

4. SCE&G to NRC, Flooding Reevaluation Results for Virgil C. Summer Unit 1 dated March 12, 2013 [ML13073A117]

5. Calculation DC02060-005, Revision 0, Stormwater Runoff from Fukushima NTTF Recommendation 2.1 PMP Event on Plant Site and Service Water Pond for Unit 1 dated April 29, 2013

6. Calculation DC02060-007, Revision 0, Estimation of Fukushima NTTF Recommendation 2.1 Probable Maximum Precipitation (PMP) for Monticello Reservoir for Unit 1 dated April 29, 2013

7. Calculation DC02060-008, Revision 0, Estimation of Fukushima NTTF Recommendation 2.1 Probable Max Flood (PMF) Elev for Monticello Reservoir & the SWP for Unit 1 dated April 29, 2013

8. GMP-101.002 " Identification, Restoration or Modification Control of Security Barriers" Revision 6 Change A

9. Operations Administrative Procedure OAP -100.4 "Communication" Revision 2

10. Operations Administrative Procedure OAP-109.1 "Guideline for Severe Weather" Revision 3, Attachment I

11. System Operating Procedure SOP-207 "Circulating Water" Revision 22 Section IV.H.

12. Letter from Shawn Williams to Thomas D. Gatlin dated January 30, 2014, Virgil C. Summer Nuclear Station, Unit 1 (VCSNS) - Request for Additional Information (TAC NO. MF1112) [ML14023A740]

13. SCE&G to NRC, Response to NRC Request for Additional Information Associated With Near-Term Task Force Recommendation 2.1, Flooding Reevaluation, dated March 26, 2014 [ML14093A320]