



October 4, 2010
NND-10-0078

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

ATTN: Document Control Desk

Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Supplemental Response to NRC Request for Additional Information (RAI) Letter No.071 Related to Probabilistic Risk Assessment and Severe Accident Evaluation

- Reference:**
1. Letter from Manny Comar (NRC) to Alfred M. Paglia (SCE&G), Request for Additional Information Letter No. 071 Related to SRP Section 19.0 for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application, dated November 3, 2009.
 2. Letter from Ronald B. Clary (SCE&G) to Document Control Desk (NRC), Response to NRC Request for Additional Information (RAI) Letter No. 71, dated December 2, 2009.

The enclosure to this letter provides an South Carolina Electric & Gas Company (SCE&G) additional response to RAI items 19-78 and 19-81 included in the above referenced letter (Reference 1). Reference 2 provided initial responses to the RAI items but these items are being supplemented based on additional discussions with the NRC staff. The enclosure also identifies any associated changes that will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA.

Should you have any questions, please contact Mr. Alfred M. Paglia by telephone at (803) 345-4191, or by email at apaglia@scana.com.

D083
NRC

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

Executed on this 4th day of October, 2010.

Sincerely,



Ronald B. Clary
Vice President
New Nuclear Deployment

AMM/RBC/am

Enclosure

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NRC RAI Letter No. 071 Dated November 3, 2009

SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation

**QUESTIONS from PRA Licensing, Operations Support and Maintenance Branch 1
(AP1000/EPR Projects) (SPLA)**

NRC RAI Number: 19-78

Follow-up to NRC RAI No. 19-1

The staff agrees that the events applicable to a site may be screened from further evaluation because they are bounded by the generic analysis documented in the referenced design certification. The remaining events applicable to a site may be screened from further evaluation because they are so infrequent that their contribution to risk is too small to affect the plant CDF or LRF, even if core damage is assumed to result. Other events that are considered to be less frequent than 1E-06 per year may also be screened if the conditional core damage probability is so low that the risk from all such sequences taken together is too small to affect CDF or LRF. Both the basis for screening events (data and logic used to screen the event) and an assessment of risk from events that cannot be screened (including appropriate references for numerical values) must be reported in the VCSNS Final Safety Analysis Report (FSAR) along with other PRA results and assumptions. Please document these PRA results in the FSAR per 10 CFR 52.79(c)(1). (Format and content expectations are documented in Appendix A to Section C.I.19 of RG 1.206, "Combined License Applications for Nuclear Power Plants.")

VCSNS RESPONSE:

The requested information will be added to the FSAR as shown below to address more completely the hazards associated with nearby facilities and external fires.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

1. In COLA Part 2, FSAR Chapter 19, Section 19.58, the following additional information will be added to the end of Table 19.58-201 as shown below.

| | | | | |
|---------------------|--|----------|--|------------|
| <u>Other Events</u> | <u>A number of external events beyond those evaluated in DCD Subsection 19.58 were evaluated for the VCSNS site. These events are discussed below.</u> | | <u>Based on the evaluations below, these events do not pose a credible threat to the safe operation of VCSNS Units 2 and 3. Thus, these events are not considered to be risk-important and it can be concluded that the VCSNS Units 2 and 3 site is within the bounds of the Floods and Other External Events analysis documented in DCD Tier 2 Section 19.58.</u> | |
| | <u>Additional events at nearby facilities</u> | <u>N</u> | <u>Based on the discussions in FSAR Subsections 2.2.3.1.1, 2.2.3.1.2 and 2.2.3.1.3, the effects of explosions, flammable vapor clouds and toxic chemicals at the Parr Combustion Turbines and VCSNS Unit 1 were evaluated and determined to meet the safe distance requirements and toxicity limits of Regulatory Guides 1.91 and 1.78. Therefore, because no risk significant consequences were identified for these events, the potential safety effect to the site is regarded as being insignificant. Thus, no further analysis is necessary.</u> | <u>N/A</u> |
| | <u>External fires</u> | <u>N</u> | <u>As stated in FSAR Subsection 2.2.3.1.4, for an assumed wildfire in the vegetation surrounding the site, given the low incident heat flux calculated, the long separation distances to safety-related structures, and the various conservatisms assumed in the analysis, a wildfire would not affect the safe operation or shutdown of Units 2 and 3. In addition, as described in Section 2.2.2, due to the lack of other facilities with hazardous materials that could create nonflammable gases or chemical bearing clouds as a result of a forest fire located within 5 miles of the site, these clouds are not considered to be a concern. Therefore, no further evaluation is necessary for these external fire events.</u> | <u>N/A</u> |

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 071 Dated November 3, 2009

SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation

QUESTIONS from PRA Licensing, Operations Support and Maintenance Branch 1 (AP1000/EPR Projects) (SPLA)

NRC RAI Number: 19-81

Follow-up to NRC RAI No. 19-1

Table 1 of the 7/14/2009 letter states that extratropical storms observed within a 25-mile radius of the proposed site were evaluated. Since many of these storms affect a very large area and storm tracks are difficult to predict, the basis for this choice is unclear. The data within this limited area are very sparse, making the uncertainty associated with the reported value relatively large. For these reasons, the staff does not consider that this class of event has been shown to be bounded by the generic assessment.

Provide the basis for concluding that a sufficient number of events have been observed over a large enough area to provide a representative sample and confirm that the generic assessment is representative. Alternatively, provide the basis for screening this event from further analysis. Otherwise, extratropical storms cannot be screened from further analysis and a more detailed discussion of the risk associated with extratropical storms must be provided in Section 19.58 of the FSAR.

VCSNS RESPONSE:

The "Extratropical Cyclone" subcategory of storms, used in APP-GW-GLR-101, was assigned an initiating event frequency of 3E-02 events per year.

From APP-GW-GLR-101, risk due to the event can be estimated using the following calculation:

$$CDF = IEF * CCDP$$

where CDF is the Core Damage Frequency, IEF is the Initiating Event Frequency, and CCDP is the Conditional Core Damage Probability. If this evaluation indicates a CDF less than 1.0E-08 events per year, then no detailed PRA is necessary.

According to data gathered from the National Oceanic Atmospheric Administration (NOAA) website (<http://csc-s-maps-q.csc.noaa.gov/hurricanes/viewer.html>, accessed March 18, 2010), there were 5 extratropical storms observed in the period of record for the 25 nautical mile radius around Columbia. Expanding the radius to 100 nautical miles increases the observed storms from 5 to 31. Utilizing the 31 events, the IEF increases from 3.22E-02 to

2.0E-01. The CCDP used in APP-GW-GLR-101 for the Loss of Offsite Power (LOOP) scenario is 9.81E-09. With this increased event frequency, the CDF remains less than 1E-08 at 1.9E-09. Therefore, no detailed PRA is necessary.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

1. In COLA Part 2, FSAR Chapter 19, Section 19.58, the information for extratropical cyclones in Table 19.58-201 will be revised as shown below.

| | | | |
|------------------------|---|---|-------------------------------------|
| Extratropical Cyclones | Y | <p>The 100 nautical mile area was considered to be excessively conservative for the evaluation of extratropical storms (which by nature of the event are storms expected to occur more inland than hurricanes) and therefore a 25 mile radius around the site was evaluated for these events. The event frequency is determined by dividing the number of occurrences of tropical weather by the measured duration (155 years), and while the event frequency slightly exceeded that given in Table 3.0-1 of APP-GW-GLR-101, this has been attributed to rounding, by Westinghouse, of the information that was provided by the NuStart member utilities.</p> <p><u>The "Extratropical Cyclone" subcategory of storms, used in APP-GW-GLR-101, was assigned an initiating event frequency of 3E-02 events per year. However, if an evaluation indicates a CDF less than 1.0E-08 events per year, then no detailed PRA is necessary.</u></p> <p><u>Initially, a 25 mile radius around the site was evaluated for extratropical storms. 5 storms were observed. When obtaining weather data for a radius of 100 nautical miles, the observed number of storms is 31. Utilizing the 31 events, the incident event frequency (IEF) increases from 3.22E-02 to 2.0E-01. The CCDP used in APP-GW-GLR-101 for the Case 1 Loss of Offsite Power (LOOP) scenario is 9.81E-09. Even with the increased event frequency, the core damage frequency (CDF) remains less than 1E-08 at 1.9E-09. Therefore, no detailed PRA is necessary.</u></p> | <p>3.22E-02 <u>2.0E-01</u></p> |
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ASSOCIATED ATTACHMENTS:

None