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Refer to: RC-94-0126

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

Attention: Mr. George F. Wunder

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50/395  
OPERATING LICENSE NO. NPF-12  
SCOPE REDUCTION FOR GENERIC LETTER 88-20, SUPPLEMENT 4  
SEISMIC EVALUATION

In letters dated December 20, 1991, and October 30, 1992, South Carolina Electric & Gas Company (SCE&G) committed to conduct a Seismic Individual Plant Examination for External Events (IPEEE) in accordance with Generic Letter 88-20, Supplement 4. Generic Letter 88-20 categorized the SCE&G seismic evaluation as a focused scope evaluation. SCE&G agreed to perform a focused scope evaluation based on the lack of resolution of the large uncertainties in seismic hazard which existed at that time.

Draft NUREG-1488, "Revised Livermore Seismic Hazard Estimates for 69 Nuclear Power Plant Sites East of the Rocky Mountains," was recently issued by NRC. This NUREG provides significant new information relative to large reductions in seismic hazard at Eastern U. S. sites. Specifically, these revised Livermore results have confirmed that the mean seismic hazard at Virgil C. Summer Nuclear Station (VCSNS) is lower than originally estimated. In fact, the VCSNS mean seismic hazard is lower than the 1989 Livermore mean seismic hazard estimates for the group of plants which were originally designated as reduced scope for the Seismic IPEEE.

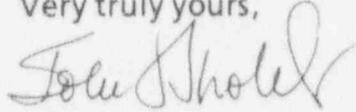
In light of this significant new information, SCE&G believes that the focused scope type evaluation for the Seismic IPEEE is no longer justified for VCSNS. Therefore, SCE&G intends to complete the evaluation at the reduced scope level of effort. This position is justified based on the significant reduction in seismic hazard documented in NUREG-1488 and by the experience obtained over the past fifteen years at many nuclear plants. This experience has demonstrated that the additional level of seismic review effort has not provided any cost-beneficial enhancements which have improved plant safety. The cost-beneficial aspects of the Seismic IPEEE are obtained through the detailed plant walkdowns. The walkdown requirements for a reduced scope program include the same rigorous requirements as the full or focused scope seismic review. SCE&G considers that the walkdown effort will satisfy the goals of IPEEE.

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A detailed discussion and further cost-benefit justifications supporting SCE&G's position are provided in the attachment to this letter. Should there be any questions, please contact Mr. Robert B. Whorton at (803) 345-4725 or Ms. April R. Rice at (803) 345-4232.

Very truly yours,



John L. Skolds

ARR:lcd  
Attachment

c: O. W. Dixon  
R. R. Mahan (w/o attachment)  
R. J. White  
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General Managers  
NRC Resident Inspector  
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File (815.14)

SCOPE REDUCTION FOR GENERIC LETTER 88-20, SUPPLEMENT 4  
SEISMIC EVALUATION

BACKGROUND

The NRC issued Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10CFR50.54(f)" on June 28, 1991, along with NUREG-1407 "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities." For the seismic portion of the IPEEE, these documents categorized or "binned" plants in the Eastern United States (EUS) as Reduced Scope, 0.3g Focused Scope, 0.3g Full Scope, and Seismic Probabilistic Risk Assessment (SPRA) type plants. The NRC binning process was done on a relative basis, mainly because of large differences in hazard estimates between the Lawrence Livermore National Laboratory (LLNL) and the Electric Power Research Institute (EPRI) seismic hazard studies which existed at that time. This process resulted in binning of plants with similar hazard levels, regardless of the absolute level of hazard (e.g., sites that fell into a group that had the lowest likelihood of exceeding the 0.3g, NUREG/CR-0008, 5% damped spectrum were assigned to the reduced scope bin).

Due to the large differences in seismic hazard between the LLNL and EPRI studies, SCE&G and other licensees accepted the relative binning concept and subsequently made commitments on the Seismic IPEEE which were appropriate at that time. VCSNS was designated as a focused scope plant and this level of effort was committed to in letters dated December 20, 1991, and October 30, 1992 to the NRC.

EVALUATION OF NUREG-1488

In 1993, the NRC issued draft NUREG-1488, "Revised Livermore Seismic Hazard Estimates for 69 Nuclear Power Plant Sites East of the Rocky Mountains." This document provides significant new information relative to large reductions in seismic hazard at EUS sites. The revised LLNL results now corroborate the earlier EPRI seismic hazard analyses and confirm that the seismic hazard at most EUS plants is low, lower in fact than the 1989 LLNL seismic hazard estimates for the grouping of plants which were originally designated as reduced scope.

The Nuclear Energy Institute (NEI, formerly NUMARC) has recently developed a white paper entitled "Justification for Reduction in IPEEE Program Based on Revised LLNL Seismic Hazard Results" which provides a detailed evaluation on the impact of the new LLNL results. This paper provides the technical basis for placement of all but a handful of plants into the reduced scope bin. SCE&G assisted in the development of the white paper and believes that it provides the necessary justification for reclassification of the VCSNS as a reduced scope plant.

## IMPACT OF REDUCED SCOPE LEVEL OF EFFORT

As discussed in the NRC white paper, the reduction in the level of effort for a reduced scope program is in no way associated with a reduction in the level of safety. There is a consensus among the seismic experts in the nuclear industry that the most important aspect of any seismic review is the plant walkdown performed by a competent review team consisting of seismic and systems engineers guided by plant operations personnel. This conclusion was supported at a recent ACRS Meeting by Mr. B. D. Liaw of the NRC Staff.

The walkdown requirements for a reduced scope program are the same rigorous requirements applied to full or focused scope reviews. A competent review team will identify the same potentially, seismically weak elements independent of the type of seismic review that is conducted. Industry experience over the past 15 years shows that seismic review teams have successfully identified all of the seismically weak elements at the time of the walkdowns. In no case were weak components identified as requiring modification based solely on the analyses which are mandated under the full and focused scope programs.

The white paper also discusses the inherent margins that exist beyond the Safe Shutdown Earthquake (SSE) level in the current vintage of nuclear plants. Typically, the median capacity for core damage from seismic events is in the range of 3 to 6 times the SSE level for plants in the EUS. Both SPRA and Seismic Margin Assessment (SMA) studies have shown that the vast majority of safety-related equipment and structures have high seismic capacity. This provides additional justification for reduction in the analysis effort required by a full or focused scope program.

## JUSTIFICATION FOR REDUCTION IN THE IPEEE PROGRAM

In light of the revised LLNL results, the white paper discusses the need for defining acceptable hazard levels to be used to judge the level of effort needed to address the Seismic IPEEE. As shown in the white paper, if the estimated Mean Core Damage Frequency (MCDF) is compared using the averages of the LLNL and EPRI results, then VCSNS has a lower MCDF (using 1993 LLNL results) than all of the original reduced scope plants (using the 1989 LLNL results). This indicates that the implicit level of acceptability in 1991 should also be an acceptable level in 1994.

The white paper provides additional detail on hazard comparisons which are summarized as follows:

1. All but a few plants have a median probability of exceeding an SSE that is less than  $1 \times 10^{-4}$ ,
2. The mean probability of exceeding the SSE at VCSNS using the 1993 LLNL results is less than the mean probability of exceeding the 0.3g Review Level Earthquake (RLE) spectrum using the 1989 LLNL results,
3. The hazard comparisons in general confirm that only a handful of existing plants should be classified in either full scope or SPRA bins. In addition, the

majority of the remaining EUS plants should be doing no more than the reduced scope level of effort.

#### COST/BENEFIT DISCUSSION

SCE&G has estimated that a cost savings of approximately \$250,000 can be achieved by changing the level of effort for the Seismic IPEEE from focused scope to reduced scope. Details of this cost estimate are provided in the NEI white paper. Based on previous SPRAs and SMAs, experience shows that there is little value gained from the additional analyses required by a focused scope program. The analyses have produced no findings which were not previously identified by the seismic walkdown/review teams.

SCE&G supports the white paper position that the additional studies required by the focused scope program are not cost justified and add no safety benefits/enhancements to the plant. This appears to meet the Cost Beneficial Licensing Action (CBLA) definitions and criteria for relief from a licensee commitment.

Lastly, in light of the revised LLNL hazard results, SCE&G now believes that the reduced scope program satisfies the Generic Letter 88-20 request for information under 10CFR50.54(f) and that the focused scope program imposes an unnecessary burden which is no longer cost justified. The prudent action for VCSNS is to conduct the level of effort which will produce the desired results, i.e., to conduct detailed plant walkdowns under a reduced scope program.

#### CONCLUSIONS

The revised LLNL seismic hazard results support SCE&G's position that the VCSNS should be conducting a reduced scope level of effort to address the Seismic IPEEE. It is necessary to modify the VCSNS program immediately in order to achieve the savings identified and to avert several near-term expenditures which are required under the focused scope review.

VCSNS was also designated by NUREG-1407 as requiring special attention to shallow soil conditions for structures on soil. Shallow soil conditions will be included in the evaluation; however, other soil failure analyses (instability, settlement, and liquefaction) will no longer be included under the reduced scope program.

Since plant walkdown requirements basically remain unchanged and continue to be critical path for completion of the Seismic IPEEE program, SCE&G foresees no significant improvement to the schedule previously submitted. However, if SCE&G is able to incorporate the containment performance evaluation during the upcoming refueling outage in the Fall of 1994 (with no impact on the steam generator replacement project), then the overall seismic IPEEE could be completed by the end of 1995. This would allow submittal of the final IPEEE report at an earlier date than previously identified.