

October 3, 2003

LICENSEE: South Carolina Electric and Gas Company

FACILITY: V. C. Summer Nuclear Station

SUBJECT: SUMMARY OF TELECOMMUNICATION (TELECON) WITH SOUTH CAROLINA ELECTRIC AND GAS (SCE&G) COMPANY REPRESENTATIVES TO DISCUSS STAFF QUESTIONS ON 10 CFR 54.4(A)(2) CRITERIA, AND RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE LICENSE RENEWAL APPLICATION (LRA) FOR THE V. C. SUMMER NUCLEAR STATION (VCSNS)

On September 2, 15, 16, 17, and 19, 2003, the NRC staff (the staff) and representatives from VCSNS (the applicant) held a number of telephone conversations (telecons) to discuss the applicant's responses to the request for additional information (RAI) on the subject matter above. These discussions related to additional staff questions on 10 CFR 54.4(a)(2) criteria, and responses to RAIs pertaining to the safety review of the VCSNS License Renewal Application (LRA). The staff also discussed several FSAR supplement summary descriptions provided in Chapter 18 of the LRA. A list of telecon participants is enclosed (see Attachment). The following is a summary of the discussions:

#### RAI S AMR-1

This staff clarification relates to Table 1 of the document "Criteria 2 Supplement to the Application for Renewed Operating License for VCSNS" submitted by VCSNS on September 12, 2002. The applicant maintained that for a number of component/material/environment combinations there is no applicable aging effect and therefore there is no applicable aging management program(s). The Staff has reviewed the related information and the basis provided by the applicant for this conclusion. The Staff has found that in order to complete the review of the aging management review (AMR) in "Criteria 2 Supplement to the Application for Renewed Operating License for VCSNS" additional information is needed from the applicant related to Item Nos. 6, 7, and 11 of Table 1 as described below.

- a. In Item No. 6 of Table 1 (p. 21) in "Criteria 2 Supplement to the Application for Renewed Operating License for VCSNS" under the 'Discussion' column the applicant stated that "this grouping (referring to component type listed in Item No. 6) also includes the internal surface of system components that contain non-dried air. These components may experience internal surface corrosion but they are not expected to have a loss of structural integrity." The staff requested the applicant to provide the basis for this conclusion, including any operating experience. The staff requested in particular to clarify whether any of the said components has any intended function that is other than structural integrity.

In addition, the staff notes that the piping and piping system components in Item No. 6 is a subset of those of Item No. 4. For this subset both items have consistent components, materials and environment (other than external versus internal). The corresponding AMR (for non-dried air in Item No. 6 or moist air in Item No. 4) leads to different conclusions for components in the two Item Nos. 4 and 6 regarding the need for aging management. The staff requested the applicant to provide the basis for the different AMR conclusions and verify the consistency with the applicant's response to the clarification on the intended function of the components.

- b. In Item No. 7 of Table 1 (p. 22) in "Criteria 2 Supplement to the Application for Renewed Operating License for VCSNS" under the 'Discussion' column, the applicant stated that raw water is part of uncontrolled water. Loss of material due to microbiologically induced corrosion (MIC) and erosion in the raw water environment are not considered as applicable aging effects/mechanisms for the components in Item No. 7. However, for a combination of components types/materials/environments in Item No. 11 (p. 24) that is consistent with that of Item No. 7, loss of material due MIC and erosion are considered to be applicable aging effects/mechanisms for a raw water environment. The staff requested the applicant to provide the basis for this difference in the AMR, including any operating experience if applicable.

For the aging management of the components considered in Item No. 11 the applicant proposed the aging management program (AMP) Service Water Reliability and In-Service Testing (B.1.9). For Item No. 7 the applicant proposed the AMP Area-Based Inspections for Refined 10 CFR 54.4(A)(2) Criteria (B. 2.13). The applicant stated in Appendix B of the VCSNS LRA that B.1.9 is consistent with GALL AMP Open-Cycle Cooling Water System (XI.M20). The GALL AMP XI.M20 involves periodic inspections. The applicant's AMP B. 2.13 uses a one-time inspection. For the part of the combination of piping and piping system/carbon, steel/raw water that is consistent for both Item Nos. 7 and 11, the staff requested that the applicant provide the basis, including any applicable operating experience that periodic inspections are necessary to manage the aging effects for Item No. 11, whereas one-time inspection is sufficient for the aging management for Item No. 7.

- c. In the discussion column of Item No. 16 of Table 1 (p. 26) in "Criteria 2 Supplement to the Application for Renewed Operating License for VCSNS", the applicant stated that the grouping included fiberglass piping insulation exposed to a moist air environment. The applicant further maintained that at VCSNS, the ambient environment did not contain contaminants of sufficient concentration to cause aging effects that require aging management. However, moisture infiltration into the fiberglass insulation materials may, over time, lead to compression or settling of the fiberglass material. This may in turn lead to a reduction of the insulating properties of the fiberglass. As a result, a different temperature distribution may arise across the layer of fiberglass insulation material with a possibly lower temperature at the piping/insulation interface. This may increase the likelihood of further moisture condensation and consequently surface corrosion of the piping materials. The staff requested that the applicant clarify whether this aging effect is applicable to the fiberglass piping insulation material for VCSNS and provide a basis, including operating experience for the clarification.

Fiberglass insulation material often has accompanying metal-foil based (such as aluminum) vapor retarder component. The staff requested that the applicant clarify whether this is the case for the insulation material used at VCSNS. If so, some parts of these metal-foil based vapor retarder components may be in contact with the metallic surface (such as carbon steel) of other, different uninsulated piping close by (not the original host piping which is insulated) due to close spatial interaction. In the presence of moisture this may give rise to galvanic corrosion. The staff requested the applicant to clarify whether loss of material due to galvanic corrosion is an applicable aging effect at VCSNS arising from the process described above and provide a basis, including operating experience for the clarification.

Area Based Inspections for Refined 10 CFR 54.4(a)(2) Criteria Questions:

RAI B.2.13-1

- a. In the element "Detection of Aging Effect(s)" the applicant stated that the AMP will use a combination of volumetric and visual examination techniques at sample locations in the drain lines determined by engineering evaluation to be most susceptible to the applicable aging effects. The applicant further maintained that, if no parameters are known that would distinguish the susceptible locations, sample locations will be selected based on accessibility and radiological concerns, and the results will be applied to the associated piping. In the case when no one single bounding location can be determined, the applicant needs to clarify whether more than one sample location (i.e., several of them, if necessary) for the same associated piping would be chosen. The staff requested the applicant to provide the basis for the clarification. From the description it appeared that only drain lines are subject to examination. The staff requested the applicant to clarify if sample locations include safety and relief valve discharge piping and verify that inspection is of internal surfaces and clarify how visual inspection will be performed on internal surfaces. Is safety and relief valve discharge piping susceptible to erosion and if so how is this managed? If not susceptible to erosion, the applicant needs to provide the basis. The staff requested the applicant to also clarify which systems are exposed to leaking ground water and how MIC is managed for these systems.
- b. The Staff noted that the applicant maintained that the acceptance criteria for the Area Based Inspections for Refined 10 CFR 54.4(a)(2) Criteria is no unacceptable loss of material of subject components that could result in a loss of the component intended function(s), as determined by engineering evaluation. In the attribute "Corrective Actions", the applicant stated that if the engineering evaluation determined that additional information was required to more fully characterize the aging effects, then additional inspections will be completed or other actions taken in order to obtain the additional information. If additional inspections were undertaken, the applicant needs to clarify whether evaluation of the inspection results will consider the present wall thickness, calculated corrosion rate, and projected wall thickness that will ensure that the minimum required wall thickness is preserved pursuant to the maintenance of the intended function of these components. The staff requested the applicant to provide the basis, including available industry operating experience for the clarification.

- c. The Operating Experience element stated that the Area Based Inspections for Refined 10 CFR 54.4(a)(2) Criteria is a new inspection activity for which there is no operating experience. The staff requested the applicant to identify any relevant operating experience, both site-specific and industry-wide, for the systems that will be managed by this program and confirm that operating experience review includes plant operating and maintenance history for the systems managed by this program, as required by Section 4.2.2.2 of NEI 95-10.

#### All Affected AMPs

- a. The staff enquired whether there were new boundary diagrams for the additional scope. If not, the staff requested the applicant to clarify how boundaries are conservatively determined.
- b. The staff noted that a supplement for AMP B.2.3 has not been included in the supplemental submittal. The staff requested applicant to clarify if that AMP was affected by the change in scope and if it was affected, submit a supplemental program description. Also, if UFSAR supplements were affected by the change in scope, the applicant needs to submit a revised UFSAR supplement for any AMP that was affected. If revised UFSAR supplements are not required, so indicate.

#### 18.2.22 Maintenance Rule Structures Program

In the FSAR supplement summary description, the staff requested the applicant to provide additional description concerning the scope of inspections to include penetrations and associated piping at structural interfaces which may be subject to degradation mechanism (including MIC).

#### 18.3.1.1 Upper-Shelf Energy

In the FSAR supplement summary description, the staff requested the applicant to provide additional description on the requirements on reactor vessel Charpy upper-shelf energy (USE). These additional details included analytical calculation details of Charpy USE for the end of the period of extended operation, the fluence values assumed, Topical Report references and a final value for the upper shelf energy for the limiting plate estimate. The staff requested that the licensee update the UFSAR descriptions as required.

#### 18.3.1.2 Pressurized Thermal Shock (PTS)

In the FSAR supplement summary description, the staff requested the applicant to provide additional information on the requirements on PTS such as the predicted value for the end of life  $RT_{PTS}$  for the shell and for the weld material. The staff requested that the licensee update the UFSAR descriptions as required.

18.3.2.1 ASME Boiler and Pressure Vessel Code, Section III, Class 1

In the FSAR supplement summary description, the staff requested the applicant to provide additional information on the ASME Boiler and Pressure Vessel Code, Section III, Class 1 which requires design analysis to address fatigue and to establish limits such that the initiation of fatigue cracks is precluded.

Based on experience the staff said that the transients used to analyze the ASME III requirements are often very conservative. Hence, the applicant needs to add margins for conservatism for the magnitude and frequency of the design transients during plant operation. The staff also requested the applicant to provide program and inspection to monitor these parameters. The staff requested that the licensee update the UFSAR descriptions as required.

18.3.2.1 ASME Boiler and Pressure Vessel Code, Section III, Class 2 and 3

In the FSAR supplement summary description, the staff requested the applicant to provide additional information on the ASME Boiler and Pressure Vessel Code, Section III, Class 2 and 3 requirement on allowable stress values based on a stress reduction factor to account for thermal cycles during normal operation. The staff requested the applicant to assure that adequate margin was available to account for 60 years of plant operation in the current analyses. The staff requested that the licensee update the UFSAR descriptions as required.

Additional staff question on Stress Corrosion Cracking of Incore Neutron Detector Conduits :

The staff requested that the licensee Incore Neutron Detector Conduits credit only the Chemistry Program for aging management of stress-corrosion cracking (SCC). The staff requested the applicant to provide justification that the chemistry alone will provide aging management of SCC for the stainless steel conduit in close proximity to the Reactor Vessel.

VCSNS has reviewed this telecon summary and did not provide any comments.

***/RA/***

Ram Subbaratnam, Project Manager  
License Renewal Section B  
License Renewal and Environmental Impacts Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No.: 50-395

Attachment: As stated

cc w/att. See next page

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**/RA/**

Ram Subbaratnam, Project Manager  
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License Renewal and Environmental Impacts Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

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Attachment: As stated

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September 2, 15,16, 17 and 19, 2003

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