

August 11, 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 REPRESENTATIVE TO DISCUSS APPLICANT'S RESPONSES TO VARIOUS STAFF REQUESTS FOR ADDITIONAL INFORMATION (RAI) - LICENSE RENEWAL APPLICATION (LRA) FOR THE V. C. SUMMER NUCLEAR STATION (VCSNS)

During the time from June 17, 2003 to July 31, 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). These discussions related to additional clarifications that the staff needed to complete their safety review of the VCSNS License Renewal Application (LRA). A list of telecon participants are enclosed (see Enclosure 1). The following is a summary of the discussions:

RAI 3.6-2:

This staff clarification relates to the RAI 3.6-2 on XI.E2 Program, "Electrical Cables not subject to 10 CFR 50.49 Environmental Qualifications Requirements Used in Instrumentation Circuits."

i. XI.E2 Program

The staff requests that the applicant provide operating experience for cables used in the subject aging management program.

ii Alternate XI.E2 Program

The staff requests that the applicant provide supplemental information for the following staff queries on the alternate XI.E2 program:

- i. Which radiation monitoring and/or nuclear instrumentation cables will be included in alternate XI.E2 program?
- ii. Describe types of cables used inside and outside containment. Are same cables types used inside and outside containment?
- iii. Are any of these cables covered under environmental qualification (EQ) program? If so, what is the qualified life of these cables.
- iv. Provide operating experience of these cables.

- v. How often these cables are inspected, tested, or replaced? Summarize the results of inspection, testing, or replacement.
- vi. What is I/V test? Is this a power factor or loss factor test? What is the test voltage for this test?
- vii. What is the basis for the ten year frequency of this test.

RAI 4.3.1-1, 4, and 5 :

This staff clarification relates to three RAIs on metal fatigue.

The applicant agreed to provide a revised attachment which includes a complete copy of the WESTEMS Thermal Cycle Counting Report in response to RAI 4.3.1-1.

The applicant agreed to provide additional response to RAI 4.3.1-4 items (a) and (b) that provides a direct response to the questions.

The applicant agreed to provide additional response to RAI 4.3.1-5 that provides the design CUFs for the NUREG/CR-6260 locations.

The applicant identified three components where the fatigue usage factor may exceed 1.0 during the period of extended operation. The applicant indicated, in response to RAI 4.3.1-1, that further actions would be taken prior to the period of extended operation to address these components. In addition, the applicant has committed to evaluate the locations identified in NUREG/CR-6260 for environmental fatigue effects prior to the period of extended operation. The applicant agreed to the following additional actions for those components where the CUF, including environmental fatigue effects, may exceed 1.0 during the period of extended operation:

- 1. Further refinement of the fatigue analysis to lower the CUF(s) to below 1.0, or
- 2. Repair of the affected locations, or
- 3. Replacement of the affected locations, or
- 4. Manage the effects of fatigue by an inspection program that has been reviewed and approved by the NRC (e.g., periodic non-destructive examination of the affected locations at inspection intervals to be determined by a method accepted by the NRC).

The applicant agreed that, if Option 4 is selected, the inspection details including scope, qualification, method, and frequency will be provided to the NRC for review prior to the period of extended operation. The staff finds the applicant's proposed actions acceptable. The staff requested that the applicant provide supplemental response confirming the staff discussions and the staff indicated that this commitment should be included in a FSAR supplement. The staff will identify this as a confirmatory item in the draft safety evaluation report (DSER).

RAI B.1.19-1:

In the telephone discussion, VCSNS pointed out that the crane and moving parts such as bearing are not in the licence renewal scope. However past operating experience at VCSNS with these components indicated that overstressed connections in trolley of polar crane resulted in failure of spent fuel bridge crane roller guide bearing in the past. The staff felt that similar age related

events could produce abnormal wear on the crane rails and the aging management program should consider such wear.

The staff's position, as described in GALL Vol. 2 item VII.B.2-a is that, loss of material due to wear on crane rails falls within the scope of license renewal, even though it is caused by active components. The crane rails are passive, long-lived components, and loss of material due to wear is an applicable aging effect. The staff requested that the applicant confirm that the program considers wear for the period of continued operation and provide the frequency of such inspections.

RAI B.1.25-1:

This RAI relates to the Preventive Maintenance activities on Terry Turbine.

The licensee stated that the activity that inspects the Terry Turbine (Turbine Driven Emergency Feedwater Pump) is performed every third refueling outage (4.5 years). The inspection was last performed in October of 1997 refueling outage (RFO-10) and the next inspection that was scheduled for May of 2002 (RFO-13) was delayed until October of 2003 (RFO-14). The staff wanted VCSNS provide rationale why this exception was made to the stipulated inspection interval. In the telephone discussion (July 14, 2003), VCSNS stated that the internal scheduling was based on vendor recommendations. The staff requested that this be confirmed.

RAI B.1.26-1 and 2:

The following two RAIs relate to the preventive maintenance activities on ventilation systems inspections under monitoring and trending.

The staff noted that the practice of preventive maintenance performed at intervals less than 5-yrs though makes VCSNS compliant with GL 89-13 requirements, but would need additional detail regarding the frequency of these periodic inspections and a rationale for the inspection frequency.

The staff also wanted VCSNS to provide supplemental details as to how the trended temperatures are subsequently used, the information from visual inspections are used and inaccessible areas tested. During the telephone discussion, VCSNS agreed to submit additional information about testing inaccessible areas and utilization of information from visual inspections.

RAI B.2.2-1:

This RAI relates to Diesel Generator systems inspection.

The staff queried if the absence of degradation for internal surfaces exposed to a moist air environment been determined by inspection. The staff wanted some clarification on why only air starting tanks were included in the inspection scope and other tanks with potential for exposure to a moist air environment, such as the fuel oil day tanks, were not. The staff also stated that based on the response to RAI 3.3.2.4.7-3, the scope of the program would be revised to include mufflers and exhaust piping. The staff requested a confirmation to the effect and these enhancements to the program be tracked as commitments.

RAI B.2.5-2:

This RAI relates to reactor building cooling unit (RBCU) inspection.

The staff requests that the applicant answer in more details the previous request to RAI B.2.5-2. During the telephone discussion, the applicant stated that the boric acid corrosion surveillance AMP is not integrated with the RBCU inspection. The staff wanted the applicant to clarify if the boric acid inspection does not include the ventilation systems and why a separate inspection was required. The staff believes that results of the RBCU and ventilation inspection should be considered and evaluated in the BAC program. The staff requested clarification to resolve this concern.

RAI B.2.11-1:

This RAI relates to Inspections of mechanical components. EPRI report 10003056 states that any wetted area should be considered MIC susceptible locations. The staff wanted the applicant to provide a justification for addressing only the groundwater-related MIC. The staff requested the response to include any operating experience on MIC.

RAI B.2.11-2:

This RAI relates to external surfaces of components fabricated of carbon steel, low-alloy steel, and other susceptible materials inspected for loss of material or cracking.

The staff requested the applicant to respond to the last sentence in the RAI - "In addition, provide the technical basis for determining how many and what additional component external surfaces are to be inspected if unacceptable degradation is observed in the representative components." In the telephone discussion, the applicant stated that, "there is a walkdown scheduled of all accessible components and if any degradation was noted, it will be addressed by the existing corrective action program under 10 CFR part 50 Appendix A." The staff requested the applicant to provide a confirmation to that effect.

RAI B.2.11-3:

This RAI relates to inspections for mechanical components which is a new plant specific program.

The staff wanted a description of the relevant training of site personnel performing these visual inspections. The staff wanted a confirmation if the inspection crew are trained to conduct VT-1 visual examinations in accordance with ASME Section XI, Table IWB 2500-1 or IWC 2500-1 and the recommendations of EPRI NP-5769. During the telephone discussion, the applicant indicated that walkdowns are routinely conducted by actual systems engineers who observe any degradation and report any abnormality noticed. The inspection findings are usually documented and followed up via a corrective action program. The staff requested the applicant to include this in the supplemental response.

RAI B.2-11-6:

This RAI relates to LRA table 3.3-1, item 5 which credits the inspections for mechanical components program for managing loss of material of the chilled water expansion tanks.

The staff wanted to know if VCSNS had a verification program such as thickness measurement of the tank bottom surfaces and if there were any assurance to support their response to RAI B.2.11-6. The applicant had asserted that any general corrosion on inaccessible tank bottoms would degrade no further than an initial oxide layer, which would provide protection from further general corrosion. The staff was particularly interested in the condition of the condensate storage tank (see RAI 3.4-13).

RAI B.2-11-7:

This RAI relates to mechanisms that can occur which may result in a loss of mechanical closure integrity for bolting materials.

The three potential mechanisms that can occur which may result in a loss of mechanical closure integrity for bolting materials, include (1) stress relaxation, (2) aggressive chemical attack from leaks of borated primary coolant (treated primary water), and (3) SCC of high strength bolting materials. The staff stated that the applicant does not discuss stress relaxation but identifies loss of bolt pre-load as not being a license renewal issue. Further the applicant does not consider SCC of bolting materials to be an aging effect requiring evaluation. The staff requests that the applicant supplement the RAI response and address issues of stress corrosion cracking and stress relaxation, high strength bolting, aggressive chemical attack by boric acid, visual inspection of external surfaces, high temperature systems less than 700°F. The staff suggested that applicant look at St. Lucie's example in this regard and supplement the response for VCSNS as appropriate.

RAI B.2.12-1 thru 5:

The following items relate to responses on Heat Exchanger Inspection.

RAI B.2.12-1:

In using this AMP to manage the galvanic corrosion, the staff requested that the applicant clarify whether the inspections are to be performed either in areas with the highest likelihood on galvanic corrosion or on an opportunistic basis. The staff requests clarification with suitable justifications for the choices. The staff also wanted to know if there are any other methods to control galvanic corrosion available in the program scope. The staff further requests wanted the applicant to clarify whether their inspections will detect galvanic corrosion.

In the telephone discussion, in response to the preceding questions, the applicant stated that, "the chemistry program could be credited with maintaining a high purity environment that has low electrolyte conductivity by maintaining chemistry within EPRI guidelines." The applicant indicated in the discussion that they will provide specifications for the conductivity measurements for water purity that controls galvanic corrosion. However the EPRI report 1003056, Appendix A identifies five methods of eliminating or significantly reducing galvanic corrosion in treated water systems,

but chemistry control is not among the five mentioned. The staff requested the applicant substantiate their claim in this regard.

RAI B.2.12-3:

The staff wanted to know how inaccessible areas are to be inspected. The staff also wanted to know what was included in the combination of proven volumetric and visual examination techniques? The staff queried if the volumetric examination technique includes eddy current testing. The staff requested the applicant provide more specific information regarding techniques and sampling of susceptible areas such as channel head components, motor cooler heat exchangers and tube sheets.

RAI B.2.12-4:

The staff wanted to know how the visual inspection would detect fouling and heat transfer problems before unacceptable degradation can occur. In the telephone discussion, the applicant stated that HEI did not find any corrosion of the tubes and noted that heat transfer may not be a safety function with these heat exchangers. The staff requested that the applicant confirm these oral statements.

RAI B.2.12-5:

The VCSNS Response to RAI B.2.12-5 claims that "At VCSNS there is no history of selective leaching, erosion-corrosion, or heat exchanger fouling occurring for the components managed by this program." The staff wanted the applicant clarify what components are managed by this program and the length of recorded history without problems with selective leaching, erosion-corrosion, or heat exchanger fouling. In the telephone discussion, applicant stated in response to the preceding questions that they had not looked at maintenance records; but had based their claims on doing a history literature search for occurrences of the aging mechanisms rather than degradation of the components. They pointed out that no unacceptable degradation was reported and that fouling was only a problem with open cycle cooling systems because the maintenance programs have prevented any problems with closed cycle cooling system (components cooled with very clean chilled water). The staff requested the applicant confirm this finding.

RAI 2.3.3.12-1:

This RAI relates to Instrument Air Supply System.

During these conference calls, the staff provided its basis for including the accumulators and the related components necessary for the operation of the feedwater isolation valves as being within the scope of license renewal and subject to an AMR. If the applicant wishes to treat this as a complex assembly, the staff requested the applicant to clearly establish the boundaries for review within the complex assembly. This could be done by identifying each structure or component that makes up the assembly and determine if it is subject to an AMR. The applicant stated that it will revise its response to this RAI and provide a listing of components which are to be included in the scope of license renewal.

#### RAI 2.3.3.8-1

This RAI relates to the Jockey Pump not being included in the license renewal scope.

In a follow-up telecom on July 10, 2003, the staff explained that the VCSNS licensing basis documentation, as reviewed within the context of 10 CFR 50.48 and GDC 3, show that the jockey pump and its associated piping and components are relied upon for compliance with 10 CFR 50.48. The applicant agreed to include the Fire Service Jockey pump and associated piping and components as components in aging management for license renewal. The Fire Protection Program will manage the aging of these components for the period of extended operation. The staff requested the applicant to supplement its response to this RAI for the staff review while including the pump and its component into scope.

#### Hose Connections

By the letter dated March 28, 2003, the staff asked, in RAI 2.3.3.8-1(3) and (4), the applicant to provide justification for excluding the hose connections from the LRA system flow diagram D-302-231, Sht. 3 and Sht. 4. Staff also presented the regulatory basis, consistent with the previous license renewal SERs, explaining how the hose connection were required to meet 10 CFR 50.48.

The staff further explained that the VCSNS licensing basis documentation, reviewed within the context of 10 CFR 50.48 and GDC 3, show that the hose connection for manual fire fighting are also relied upon for compliance with 10 CFR 50.48. The applicant agreed with the staff and stated that VCSNS will expand the scope for license renewal to include fire hose connections identified by the Staff on drawing D-302-231, Sheets 3 and 4. The piping and piping components added by this expansion of scope are passive, long-lived, and support a license renewal intended function as a pressure boundary for the Fire Service System. The Fire Protection Program will manage the aging of these components for the period of extended operation. The applicant will supplement its response to this RAI for staff review.

#### RAI 3.1.2.4.7-1 & 2:

This RAI relates to the inservice inspection(ISI) of the steam generator internals. The staff requested that the applicant confirm that the ISI program includes inspection of the feed water flow nozzle thermal sleeve attachment weld and flow limiter steam outlet nozzle. The staff requested that the applicant also confirm that the ISI plan includes inspection of feed water distribution pipe and fittings.

#### RAI 3.3.2.4.12-1:

This RAI relates to the instrument Air Supply System and the previous staff request on the issue. The response to this RAI declared that the VCNS responses to the NRC GL 88-14 resolved the concerns for quality of air supplied to safety related equipment. The staff recognizes that, except for small portions of the instrument air and service air systems, the applicant does not identify aging effects for the majority of the instrument air system carbon steel components on the basis that they are considered exposed to dry compressed air. The staff understands that an engineering change request was in process to improve moisture removal for the instrument air system. This suggests that the compressed air may actually contained moisture rather than dry

air. As required by the SRP-LR Appendix A, the operating experience of aging management programs including past corrective actions resulting in program enhancements or new programs should be considered. Since the LRA does not address the extent of compliance with GALL program XI.M24, additional operating experience is required to support the basis for concluding that there are no aging effects for carbon steel and cast iron components (other than the limited uncontrolled portions considered as moist air) exposed to the instrument air environment. Please submit objective evidence such as recent operating experience to support the conclusion that the majority of the instrument air is dry compressed air and that there are no aging effects on carbon steel components for this environment.

RAI 3.12.4.7-11 & 12:

The staff requested the applicant to confirm that the VCSNS in service Inspection (ISI) plan includes attachment welds for the feedwater nozzle thermal sleeves, the steam outlet nozzle flow limiter and feed distribution pipe and fittings.

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

Enclosures: As stated

cc w/encl: See next page



air. As required by the SRP-LR Appendix A, the operating experience of aging management programs including past corrective actions resulting in program enhancements or new programs should be considered. Since the LRA does not address the extent of compliance with GALL program XI.M24, additional operating experience is required to support the basis for concluding that there are no aging effects for carbon steel and cast iron components (other than the limited uncontrolled portions considered as moist air) exposed to the instrument air environment. Please submit objective evidence such as recent operating experience to support the conclusion that the majority of the instrument air is dry compressed air and that there are no aging effects on carbon steel components for this environment.

RAI 3.12.4.7-11 & 12:

The staff requested the applicant to confirm that the VCSNS in service Inspection (ISI) plan includes attachment welds for the feedwater nozzle thermal sleeves, the steam outlet nozzle flow limiter and feed distribution pipe and fittings.

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

Enclosures: As stated

cc w/encl: See next page

DISTRIBUTION:

See next page

**Accession no.: ML032250136**

C:\ORPCheckout\FileNET\ML032250136.wpd

OFFICE	PM:RLEP:DRIP	PM:RLEP:DRIP	PM:RLEP:DRIP	SC:RLEP:DRIP
NAME	RSubbaratnam	RAuluck	MJenkins	SLee
DATE	08/6/2003	08/11/2003	08/5/2003	08/11/2003

OFFICIAL RECORD COPY

DISTRIBUTION: Summary of June 17, 2003 and July 31, 2003 telecon between NRC and SCE&G  
August 11, 2003

**Accession no.: ML032250136**

**HARD COPY**

RLEP RF  
Project Manager  
S. Miranda  
M. Khanna  
Y.I. Li  
C. Lauron

**E-MAIL:**

PUBLIC  
W. Borchardt  
D. Matthews  
F. Gillespie  
C. Grimes  
RidsNrrDe  
E. Imbro  
G. Bagchi  
K. Manoly  
W. Bateman  
J. Calvo  
R. Jenkins  
P. Shemanski  
H. Nieh  
J. Fair  
S. Black  
B. Boger  
D. Thatcher  
R. Pettis  
G. Galletti  
C. Li  
J. Moore  
R. Weisman  
M. Mayfield  
A. Murphy  
W. McDowell  
S. Smith (srs3)  
S. Duraiswamy  
C. Munson  
RLEP Staff

-----  
K. Landis  
C. Julian  
K. Cotton  
L. Plisco, RII  
K. Clark  
M. Kotzalas

## LIST OF ATTENDEES

### V.C. SUMMER NUCLEAR STATION (VCSNS)

June 17, 2003 to July 31, 2003

#### Telecon Participants

#### **Attendees**

Duc Nuygen  
Raj Auluck  
Ram Subbaratnam  
John Fair  
John Tsao  
Jai Rajan  
Naem Iqbal  
Al Paglia  
Jamie LaBorde  
Michael Dantzler  
Richard McNally  
Amy Hull  
Vik Shah

#### **Affiliation**

NRC/NRR/DE  
NRC/NRR/DRIP  
NRC/NRR/DRIP  
NRC/NRR/DE  
NRC/NRR/DE  
NRC/NRR/DE  
NRC/NRR/DSSA  
SCE&G  
SCE&G  
SCE&G  
NRC/DE/EMEB  
ANL  
ANL

VIRGIL C. SUMMER NUCLEAR STATION  
South Carolina Electric & Gas Company

cc:

Ms. Kathryn M. Sutton, Esquire  
Winston & Strawn Law Firm  
1400 L Street, NW  
Washington, DC 20005-3502

Mr. R. J. White  
Nuclear Coordinator  
S.C. Public Service Authority  
c/o Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 802  
Jenkinsville, South Carolina 29065

Resident Inspector/Summer NPS  
c/o U.S. Nuclear Regulatory Commission  
576 Stairway Road  
Jenkinsville, South Carolina 29065

Chairman, Fairfield County Council  
Drawer 60  
Winnsboro, South Carolina 29180

Mr. Henry Porter, Assistant Director  
Division of Waste Management  
Bureau of Land & Waste Management  
Department of Health & Environmental  
Control  
2600 Bull Street  
Columbia, South Carolina 29201

Mr. Gregory H. Halnon, General Manager  
Nuclear Plant Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station, Mail  
Code 303  
Post Office Box 88  
Jenkinsville, South Carolina 29065

Mr. Melvin N. Browne, Manager  
Nuclear Licensing & Operating Experience  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station, Mail  
Code 830  
Post Office Box 88  
Jenkinsville, South Carolina 29065

Ronald B. Clary  
Manager, Plant Life Extension  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Post Office Box 88  
Jenkinsville, South Carolina 29065

Mr. Fred Emerson  
Nuclear Energy Institute  
1776 I St., N.W., Suite 400  
Washington, DC 20006-3708