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SCE&G®
A SCANA COMPANY

June 17, 2002

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

Attention: Ms. K. R. Cotton

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
TECHNICAL SPECIFICATION AMENDMENT REQUEST - TSP 99-0090
SPENT FUEL POOL STORAGE EXPANSION - SUPPLEMENTAL LETTER - RESPONSE TO RAI DATED MAY 8, 2002

Reference: S. A. Byrne Letter to Document Control Desk, RC-01-0135, Dated July 24, 2000

South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby submits a response to your verbal questions, dated April 1, 2002, concerning the above referenced license amendment request (LAR). This request for additional information asked specific questions related to control of radiation and dose received during implementation of this project. The questions and responses are provided in Attachment I.

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

Should you have questions, please call Mr. Philip A. Rose at (803) 345-4052.

Very truly yours,

Stephen A. Byrne

PAR/SAB/dr
Attachment

c: N. O. Lorick
N. S. Carns
T. G. Eppink (without attachment)
R. J. White
L. A. Reyes
NRC Resident Inspector
Paulett Ledbetter
K. M. Sutton
T. P. O'Kelley
W. R. Higgins
RTS (0-L-99-0090)
File (813.20)
DMS (RC-02-0106)

A001

STATE OF SOUTH CAROLINA :
: **TO WIT** :
COUNTY OF FAIRFIELD :

I hereby certify that on the 17th day of June 2002, before me, the subscriber, a Notary Public of the State of South Carolina personally appeared Stephen A. Byrne, being duly sworn, and states that he is Senior Vice President, Nuclear Operations of the South Carolina Electric & Gas Company, a corporation of the State of South Carolina, that he provides the foregoing response for the purposes therein set forth, that the statements made are true and correct to the best of his knowledge, information, and belief, and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal

Notary Public

My Commission Expires

July 13, 2005
Date

Attachment I
Responses to Request for Additional Information

In your submittal, Section 9 of the Holtec report HI-2012624, page 9-11, Table 9.4, in footnote 1, the statement "... and *possible* (emphasis added) diving operations, which assume 20 to 40 mrem/hr..." appears to be inconsistent with the statement on page 10-2, "Underwater diving operations *are required* (emphasis added) to remove underwater obstructions and the existing racks, to aid in rack installation...". Assuming that divers will be used, the NRC staff finds the information, methods and guidance (pertinent to diving) in Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants," June 1993, acceptable for controlling diving operations.

1. a. *Provide a description of any sources of high radiation (greater than 0.1 rem @ 30cm) that may be in the SFP (other than fuel) during diving operations at any time during the reracking process. Describe the controls in place to ensure diver exposures are maintained ALARA.*

Response:

Aside from the fuel assemblies and other miscellaneous items maintained by Reactor Engineering inventory in debris, trash or nozzle containers, the only other potential source of high dose is spent vacuum filters. However, the filters will be temporarily stored in the transfer canal or other underwater location away from any dive locations. Disposal of the filters will occur after the completion of the project.

Regarding the controls in place to ensure ALARA for the diver, extensive surveys will be done of the dive area. The diver shall be made aware of these surveys, as well as the location of any radiation sources in the pool, whether in the dive area or not. Additionally, the scope and objective of each dive shall be clearly understood by both the dive team and the supporting HPs. No divergence from this scope shall be allowed within a prescribed dive. Exposure monitoring of the diver shall be constant via remote detection devices worn by the diver. Additionally, the diver will have a hand held probe to allow him to do surveys of items and locations as directed by Health Physics.

b. *Describe what methods and precautions (such as use of remote TV monitoring, diving cages-barriers, etc.) will be used to ensure that the divers maintain a safe distance from any high radiation sources in the SFP. Describe the controls for monitoring and maintaining oversight and control of the divers' movements and activities. On the basis of the lessons learned from the diving incident at Calvert Cliffs (described in NRC Information Notice 97-68), merely providing a tether to the diver was not sufficient to prevent an inadvertent, close approach to very high radiation area (created by a discharged fuel bundle).*

Response:

Audio and video monitoring shall always be in place to allow for constant surveillance of the diver. Any loss of either of these monitoring capabilities will result in automatic termination of the dive. Additionally, dive barriers will be placed to act as a physical demarcation of the dive area in order to reinforce the safe dive area to the diver.

c. *If divers are allowed in the pool during fuel movement, describe in detail all controls in place that prohibit diver access to high and very high radiation areas around the fuel or other sources.*

Response:

No diving shall be allowed in the pool during fuel shuffles.

d. *Given the need to shuffle fuel in and out of racks during the re-rack project, describe your plans to survey the areas affected by the fuel movement to ensure that, after each fuel shuffle (fuel relocation) and before they re-enter the pool, divers do not inadvertently enter the high and very high radiation areas created by the fuel.*

Response:

Prior to an initial dive during a particular evolution of the project, an extensive grid survey shall be completed of the dive area using two independent instruments. Daily surveys shall also be completed as long as diving operations are in progress. Extensive surveys shall be completed following change in conditions; i.e., a fuel shuffle, rack movements, etc., prior to continuing dive operations in the same area.

e. *Describe how you plan to monitor the doses received by the divers during all reracking operations (e.g., use of whole body and extremity dosimetry, personal alarming dosimeters, remote readout radiation detectors, etc.).*

Response:

The divers will be monitored using multiple TLD's and Electronic Dosimeters with remote monitoring capabilities, to ensure extremity and whole body doses are tracked appropriately. See (1a) above for additional controls.

f. *Describe the extent of radiation protection technician (RPT) coverage provided for the pool reracking (e.g., continuous RPT coverage will be provided when a diver is in the pool; continuous RPT coverage will be provided when materials are being removed from the pool, etc.). Describe how the RPT providing job coverage will be included in the periodic pre-job/status briefings.*

Response:

Continuous HP coverage will be provided anytime a diver is in the water, or anything is coming out of the water. Each morning, a pre-job briefing will be held with the HP and the job crew, to ensure that everyone knows what conditions will be present during the day. This briefing will cover Operational Experience pertinent to the day's activities.

2. a. *Describe any radiation surveys that will be performed (from the pool rim or by divers in the pool) to monitor/map dose rates In the SFP, or to check for contamination of material, equipment or divers upon removal from the pool.*

Response:

Radiation surveys shall be completed for all evolutions involved with the reracking operation. All items that are to be removed from the pool, shall be surveyed from the surface prior to removing them from the pool. Additional surveys and rinsing will be done as the item breaks the water surface. Additionally, as applicable, smears shall be taken on items to determine contamination levels and take appropriate measures and controls to minimize the potential for the spread of contamination.

b. *Describe any radiological training (as required by 10 CFR Part 19.12) provided to the divers, specific to the hazards of working around spent fuel, and including the extremity dose hazards of improperly handling (e.g., picking up by hand) potential highly activated debris in the pool.*

Response:

All personnel who obtain unescorted access to the site receive station orientation training (SOT). All individuals involved in the reracking project will receive SOT 2 and 3 which addresses radiation and contamination controls as part of the Plant access training program. Additionally, a project specific training program shall be given to all supporting participants of the project. Specific training regarding the hazards of hot particles, potential for extremity dose hazards due to inappropriate handling of sources, Operating Experience related to rerack projects, etc., will be covered as part of the project specific ALARA briefing that will be conducted prior to project commencement. The ALARA briefing will be incorporated into the pre-job briefing performed daily. The divers will be fully qualified for nuclear diving and will be trained accordingly.

3. a. *During and after completion of the reracking project, what plans does the licensee have to store miscellaneous irradiated radioactive materials (MIRM) atop the fuel racks, or attached and hanging along the inside walls of the fuel pool?*

Response:

At the present time, SCE&G does not have any plans to store MIRM atop the fuel racks or hanging along the inside walls of the spent fuel pool (SFP). All MIRM stored in the SFP is currently stored either within spent fuel rack cells or resting on the floor of the SFP.

b. *If MIRM storage is allowed atop the fuel storage racks, or along the sides of the pool, describe the controls that would be established to limit the materials height above the fuel racks and the resultant radiation levels increases above and around the pool in the event as a result of an inadvertent loss of pool water shielding.*

Response:

Any MIRM storage in the SFP would be controlled per existing Reactor Engineering procedures. All MIRM currently stored in the SFP is stored at or below the elevation that spent fuel is stored. Therefore, the radiation levels following a loss of SFP water shielding would not be significantly affected by the MIRM.

c. *If MIRM storage is allowed along the sides of the fuel pool, describe the administrative and physical controls to ensure that the MIRM are not inadvertently raised above or brought near the surface of the pool water.*

Response:

The spent fuel handling tool is used to move most MIRM containers in the same manner as spent fuel movement. The geometry of the SFP bridge crane and the spent fuel handling tool ensures the minimum required amount of shielding is maintained during movement. A few MIRM containers are moved using other tools, but they are controlled by procedures and are only raised high enough to clear the spent fuel racks. Health Physics' procedures require highly contaminated or activated materials in these areas to be kept in such a manner as to prevent them from being inadvertently raised, e.g., locking device or need of special tool for lifting.

4. *Discrete hot particles (spent fuel or activated corrosion and wear products) can be present in spent fuel pools (e.g., on fuel racks) and be of sufficient activity to cause significant, inadvertent whole body, deep dose exposures to divers.*

a. *Describe the survey program for identifying hot particles and minimizing their potential spread. For example, how will the licensee ensure that workers preparing the used racks for packaging and shipment are adequately monitored for hot particle doses (for both shallow and deep dose equivalents).*

Response:

The highest potential for hot particles is with items being removed from the spent fuel pool. In order to minimize dose received by project personnel from hot particles, extensive surveys and rinsing of items removed from the pool shall be taken prior to any direct handling by the workers. The racks will be decontaminated to levels that will ensure DOT shipping regulations can be achieved and worker doses minimized. Any hot spots that are found that cannot be removed will be marked so that all personnel are aware of its location in order to take advantage and practice time, distance, and shielding from the dose source. Engineering controls have also been put into place to minimize the actual contact that workers will have with a rack removed from the pool. Existing racks are handled and bagged remotely, thus reducing the possibility of contact or dose from hot particles on the rack. Additional handling of the rack after it is bagged allows for minimal direct contact with the rack.

b. *Describe how the SFP floor will be "inspected and any debris .....removed" (p. 10-8, section 10.7), relative to the concerns for diver doses discussed in Question 2.b. above.*

Response:

Prior to any diving, the spent fuel pool floor in the dive area will be cleaned via vacuuming using long-handled poles. After vacuuming, a radiation survey of the dive area, including the floor, vacuum hoses, and vacuum will be completed in order to confirm and map the doses in the dive zone. Final inspection of the floor of the dive area will be done via underwater camera. Any items that cannot be retrieved by vacuuming, will be retrieved by remote tools and placed into a storage container located away from the diver.

c. *Describe the "pressure washing" (pg. 10-8, Section 10.6) technique used for washing the old racks prior to removal from the pool. IN 2002-03 describes the importance of maintaining a minimum distance from the rack when hydro-lazing, to ensure maximum decontamination effectiveness. Describe how this will be accomplished.*

Response:

After the rack has been lifted from the floor and moved to a location close to the wall for removal, the rack will be lifted such that it hangs just below the water surface. At this time, a pressure washer with capabilities of 4000psi maximum will be used, as deemed necessary by the HP, to clean the interiors of each cell. The nozzle tip used is a four-way nozzle. As the pressure washer wand is lowered into each cell, the wand operator will rotate about the cell as practical to ensure that the nozzle tip covers all areas of the wall and is in close proximity to the each wall. Once all of the cells have been cleaned, the four exteriors of the rack will also be pressure washed. This washing will be done in approximate four-foot increments. Once one section of

the rack is completed, the washed section of the rack will be removed from the water, allowing HPs to commence their survey process while the next incremental four feet of the rack are pressure washed. This process continues until the complete rack has been removed from the pool. While the rack hangs above the pool, surveys may show the need to pressure wash the underside of the rack. If necessary, the pressure-washing wand is reconfigured to address the cleaning of the rack underside. Administrative controls will be in place to assure that no water/debris is washed out of the pool

5. *In Section 9.4 of the Holtec Report, page 9-6, shielding calculations in the area near the gate slot to the transfer canal show that to maintain the designated Zone II radiation levels, Rack B-2 (nearest to the gate slot) would need some fuel loading constraints. Describe what constraints will be employed and when they will be instituted to maintain worker doses ALARA. Other than minimizing doses to workers on the crane work platform with the transfer canal empty, when would increased dose rates in this area present a worker dose problem?*

Response:

The fuel loading constraint required to maintain Zone II radiation levels is for the first 5 rows of Rack B2 to contain no fuel assemblies which were discharged in the last 15 years while the fuel transfer canal (FTC) is empty. Unless required to be drained, the FTC normally remains filled. To administratively control dose rates, the Reactor Engineering procedure which develops spent fuel movement plans will limit the first 5 rows of Rack B2 to fuel with >15 years decay time. The Operations procedure which is used to drain the FTC will notify Health Physics to survey the SFP area and post the radiation zones accordingly. The SFP fuel movement procedure will address the scenario of fuel movement while the FTC is empty. These procedures will ensure that workers in the area are aware of the potential issues, similar to the controls provided in the other radiation zones around the plant. The area most affected by the new spent fuel rack configuration will be within the FTC itself, so any personnel performing fuel transfer system maintenance with the FTC drained will require additional Health Physics controls commensurate with the higher radiation levels. The FTC will remain filled during the rack removal and installation process.