SOUTH CAROLINA ELECTRIC & GAS COMPANY
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May 17, 1982

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Radiation Monitoring

Dear Mr. Denton:

A description of radiation monitor RM-G7 is described in Chapter 12.1 of the Virgil C. Summer Nuclear Station FSAR. Recent information from the plant indicates that the 300 millicurie CS-37 source provided with the detector is not adequate for the detector to read on scale.

South Carolina Electric & Gas Company has decided to forgo the use of the source since it is not required to demonstrate the functional capability of the detector. A copy of marked up FSAR pages is provided. They will be included in the next FSAR amendment.

If you have any questions, please let us know.

Very truly yours,

for T. C. Nichols, Jr.
Senior Vice President
Power Operations

RBC:TCN:lkb
Attachment
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of the gamma dose rate levels in selected areas of the plant. Reliable power for the instrumentation is obtained from the diesel backed, 120 volt instrument buses. The local audible and visual alarm are powered from the 120 volt buses. The movable channel is powered from 120 volt outlet.

Except for the movable unit, which is equipped for local recording and indication, the measured dose rate levels are indicated and recorded on the area radiation monitoring system control panel located in the control room. Local indication is provided for each monitor except RM-G18. Each area radiation monitor is equipped with two adjustable alarm levels (alert and high) and a channel failure and/or loss of power alarm (except RM-G7). (Insert A) These alarms (from the fixed monitors) are connected to an annunciator panel on the radiation monitoring system control panel in the control room. Each area radiation monitor, except for RM-G17A&B and RM-G18, is provided with a local audible and visual alarm located near the detector or local readout. The manipulator crane area monitors each have an audible alarm in the fuel handling area. The alarm setpoints are adjustable and are dependent upon the location of the individual monitors. In general, the alert setpoint is adjusted to a level below the high setpoint to provide warning of a change in normal plant operation conditions. The high setpoint is generally established by the zone limitations established for each area. The gamma dose rate resulting from a postulated loss of coolant accident (LOCA) is monitored by the high range reactor building monitor, RM-G7 and RM-G18. RM-G7 located in a reactor building penetration (see Figure 6.2-60a), is designed to withstand a seismic event and is not exposed to the anticipated LOCA environment. RM-G18, located inside the containment, is designed to meet IEEE-323-1974, IEEE-344-1975, ANSI N320-1978.

Radiation monitor RM-G7 has a gamma sensitive stainless steel ion-chamber fully inserted in the two inch pipe inside containment penetration No. 309 shown in Figure 6.2-60a which extends into the containment, is located at 237°-50' at the 477 foot elevation. The energy response of the detector is sensitive to 60 KEV. This low energy response is attenuated by the penetration end cap. The design temperature limit of the detector is 300°C and the stainless steel

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Channel RM-G7 provides alarms for alert, high, and upon loss of power to the alarm module.

clad coaxial cables are welded to the detector housing with interface connections located in the penetration access area. Local indication and alarm is located in the penetration access area and indication is provided near the entrance to the containment personnel access hatch and in the control room. The design range was 10 to 10^7 R/hr, however with a detector sensitivity of 4.5×10^{-13} amps/R/hr. and the 8 - decade continuous analog readout, the range is approximately 2.2 to 2.2×10^8 R/hr. The analog signal is recorded on a multipoint recorder in the control room radiation monitoring system panel. High gamma dose rate ~~and/or channel failure are~~ is annunciated in the control room. Instrument power is obtained from the B-Train diesel backed 120 Vac. The detector and control room readout have been seismically qualified by testing to meet criteria equivalent to the requirements of Regulatory Guide 1.100.

Radiation Monitor RM-G18, added to the radiation monitoring system to meet the intent of NUREG-0578, provides a diverse means of measuring the containment for high level gamma radiation. The detector for RM-G18 is a stainless steel gamma sensitive ion-chamber that is wall mounted inside the containment above the 463 foot floor elevation, reference Figure 1.2-6. A continuous 7 - decade analog readout is provided in the control room radiation monitoring system panel with an indication range of 1 to 10^7 R/hr. The detector energy response is sensitive to 60 KEV, -15% at 80 KEV and within $\pm$ 10% from 100 KEV to 3 Mev.

The analog signal is recorded on a multipoint recorder which was seismically qualified with the radiation monitoring system panel. High gamma dose rate or channel failure are annunciated in the control room.

Instrument power is obtained from the A-train diesel backed 120 Vac. The detector and control room readout have been type tested for seismic qualification to meet the requirements of Regulatory Guide 1.100 and are designed to meet the requirements of IEEE-323(1974). The detector and its interface cable-connector assembly have been type tested for LOCA environment to meet Regulatory Guide 1.89. Calibration of the high range containment gamma monitors shall be performed during refueling and shall consist of verification of the readouts by a calibrated current source and by a point source verification of response of the ion-chamber detectors in the low range.

Monitor RM-G18 incorporates a built-in periodic electronic test signal to verify the function of the detector and cable. ~~Monitor RM-G7 is provided with a shielded radioisotope source, approximately 300 millicurie CS-137, which can be inserted into an adjacent 6-inch pipe well next to the detector. Extension of this source provides a response verification within the first decade.~~ The detector for RM-G7 was calibrated up to 2.35 x 10^6 R/hr as verified by dosimetry in accordance with ASTM standard D-1617-72.

The gamma dose rate in the reactor building manipulator crane area, during refueling, is monitored by RM-G17A and RM-G17B. Either one, upon detection of high activity or loss of signal, interlock to close the purge discharge valves (Figure 11.4-1). These monitors are not required during normal operation.

Area radiation monitor electronics have a five decade logrithmic scale with a nominal measurement accuracy of ±25 percent of the reading. The precision is ±15 percent at all levels. Area radiation monitors are calibrated on a routine basis and after any maintenance work is performed on the detector by exposure to a standard radioactive source with its calibration traceable, directly or indirectly to the National Bureau of Standards. Calibration of the high range area monitor, RM-G7 and RM-G18 uses a calibrated electrical current source to verify the performance of the readouts