SOUTH CAROLINA ELECTRIC & GAS COMPANY
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May 14, 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
FSAR Questions-Process Control
Program

Dear Mr. Denton:

South Carolina Electric and Gas Company (SCE&G) hereby provides the responses to FSAR Questions 321.17, 321.18, 321.19, 321.20, 321.21, 321.22 and 321.23 concerning the Process Control Program as requested in a letter dated April 12, 1982 from Mr. B. J. Youngblood of the Staff.

If you have additional questions, please let us know.

Very truly yours,

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

TE:TCN:tdh

cc: V. C. Summer (w/o attach.)
G. H. Fischer (w/o attach.)
H. N. Cyrus
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Question 321.17

Describe how you propose to comply with the interface requirements spelled out in the ChemNuclear Topical Report for their cement solidification system.

Response:

Provisions have been made to supply ChemNuclear with the interface requirements listed in their cement solidification system Topical Report. These services include the following:

(1) General

Electrical:	120A, 480/3 Phase/60Hz
Service Water:	25 gpm at 80 psi minimum
Service Air:	75 SCFM at 80 psi minimum
Waste:	1-1/2 inch 150 pound ANSI flange connection
Dewater:	1-1/2 inch 150 pound ANSI flange connection
Vent:	A 4 inch stub connection on the building ventilation header to interface with Chem-Nuclear's blower exhaust.

(2) The ChemNuclear control panel is located in the drumming station control room. The plant operator and the CNSI portable unit operator are in direct communication with one another during a waste transfer operation.

(3) Prior arrangements for shipping of the solidified material shall be made.

(4) Preparations to accept cement shipments shall be made prior to the arrival of the unit on site.

(5) A Radiation Work Permit (RWP) must be issued to the CNSI operator before waste processing begins, according to SCE&G's radiation protection procedures.

(6) Any clothing or equipment for necessary radiation protection of the CNSI operator shall be provided.

(7) A controlled area already exists around the processing area including the cement storage trailer.

(8) An area inside the Hot Machine Shop has been designated to be used for test solidifications.

(9) Crane services, torque wrenches, and other material necessary shall be provided for loading the disposable liners and preparing the solidified waste for shipment.

(10) A forklift capable of 4000 pounds at 6 foot moment arm shall be provided as necessary to move CNSI portable skids.

Question 321.18

Provide tables showing how the utility equipment, components, structures and services that interface with the skid-mounted cement solidification system comply with the applicable criteria of Regulatory Guide 1.143, Rev. 1, October 1979, "Design Guidance for Radioactive Waste Management Systems, Structures and Components Installed in Light-Water-Cooled Nuclear Power Plants" and Branch Technical Position ETSB 11-3, Rev. 2, July 1981, "Design Guidance for Solid Radioactive Waste Management systems Installed in Light-Water-Cooled Nuclear Power Plants".

Response:

Valves (GAI)

Type	Design and Fabrication	Inspection and Testing	Materials*
Diaphragm (Dia.)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/74)
Check (H_2O)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/74)
Dia. (auto.)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/74)
Plug (auto.)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (3/73)
Check	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (2/74)
Check (N_2)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/74)
Dia. (N_2)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/74)
Dia. (control N_2)	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (6/75)

Valves (Westinghouse)

Dia.	ANSI B16.5 (1968) ASME B&PV Sec. III	ANSI B16.5 (1968)	ASTM (1/73)
Dia. (auto)	ANSI B16.5 (1968) ASME B&PV Sec. III	ANSI B16.5 (1968)	ASTM (1/73)
Check	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (11/71)
Globe	ANSI B16.5 (1968)	ANSI B16.5 (1968)	ASTM (11/71)

*Dates listed under Materials refer to specification issue dates. The ASTM Standard applicable to these dates apply.

Equipment

Equipment	Spec. Issue Date*	Design and Fabrication	Inspection and Testing	Materials
Tank (CD)	6/72	ASME B&PV Sec. VIII	ASME B&PV Sec. VIII	ASME B&PV Sec. VIII
Tank (PSRS)	6/72	ASME B&PV Sec. III	ASME B&PV Sec. III	ASME B&PV Sec. III
Tank (NBSRS)	6/75	ASME Section VIII	ASME Section VIII	ASTM
Tank (WBCT)	1/74	ASME Section VIII	ASME Section VIII	ASTM
Tank (PSR)	11/71	ASME Sec. III, Hydraulic Inst. Standard (HIS)	ASME Section III, HIS	ASME Section III
Pump (NBSR)	1/74	HIS	HIS	ASTM
Pump (WBC)	1/74	HIS	HIS	ASTM
Pump (CD)	11/71	HIS	HIS	ASTM
Filters	7/72	ASME Section VIII	ASME Section VIII	ASTM

Piping (GAI)

System	Spec. Issue Date*	Design and Fabrication	Inspection and Testing	Materials
Waste, H_2O	10/73	ANSI B31.10	ANSI B31.10	ASTM
N_2, Air	10/73	ANSI B31.10	ANSI B31.10	ASTM

Piping (Westinghouse)

Waste, N_2, H_2O	8/71	ANSI B31.10	ANSI B31.10	ASTM

*Use these dates for refering to the revisions of the standards listed.

Notes:

CD = Chemical Drain
PSRS = Primary Spent Resin Storage
NBSRS = Nuclear Blowdown Spent Resin Storage
WEC = Waste Evaporator Concentrates
B&PV = Boiler and Pressure Vessel Code

Question 321.19

Describe how the plant design, as it relates to the cement solidification system, reflects consideration of the following design features intended to maintain occupational radiation exposures ALARA:

a Minimizing the length of piping runs
b. Avoiding low points and dead legs in piping
c. Using larger diameter piping to minimize plugging

Response:

a. The spent resin storage tanks, the waste evaporator concentrates tank, and the associated pumps are located in the Auxiliary Building at floor elevation 412'. The waste hold-up tank, the chemical drain tank, and the associated pumps are located at floor elevation 374'. The portable cement solidification area is located directly above this equipment at floor elevation 436'. By locating the equipment as such, the piping runs are minimized.

b. The resin transfer lines are sloped to avoid low points in the piping. Also, 5 diameter pipe bends are used from the resin tanks to the solidification area. These long sweeping bends are necessary to avoid plugging that could occur in the inner wall of a bend. Instrument lines are kept to a minimum to avoid dead legs. All lines will be flushed with make-up water prior to any maintenance activities.

c. The resin and waste transfer lines are 2" nominal diameter. This size is sufficient for the desired flow rates without causing excessively large pressure drops that could result in line plugging.

Question 321.20

Clarify whether heat tracing has been incorporated for tanks that contain evaporator concentrates that are likely to solidify at ambient temperatures.

Response:

Heat tracing has been incorporated in the Waste Evaporator Concentrates Tank which is the only waste tank that contains concentrates likely to solidify at ambient temperatures.

Question 321.21

Describe the equipment, components or structures and services you provide for containing radioactive spills that may occur in the cement solidification system.

Response:

In addition to the process equipment discussed in Chapter 11.5.8.1 of the FSAR, a remote camera will be located in the waste processing area to view the liner and associated connections during a packaging operation. Both the ChemNuclear operator and the plant operator will have the capability to observe the equipment during processing of waste from the drumming station control room. If leaks of any kind or spills are observed, the operation in progress can be immediately terminated. Any spill which may occur will be contained by permanent and/or portable curbing in the solidification area and in the truck bay when this area is used.

Questions 321.22

Describe the plant inspection program to assure that cement and/or conditioning chemicals are maintained at the proper quality during the time they are stored.

Response:

ChemNuclear's solidification system uses Portland 1 cement, calcium hydroxide, and sodium sulfate. These chemicals have an indefinite shelf life as long as moisture is excluded. The cement is stored in a bulk trailer and the other chemicals are stored in the radwaste packaging area in the Auxiliary Building. Prior to a full scale solidification, a successful sample solidification is performed using materials obtained from the full-scale solidification supplies in accordance with the PCP. Until an acceptable test solidification is obtained, full scale solidification will not take place. In this manner, the quality of the solidification chemicals is assured.

Question 321.23

Describe how the curie content and identification of radionuclides in each container are determined prior to shipment.

Response:

The primary activity determination method will be to sample the waste stream (resins and liquid waste) during transfer to a process container and analyze the sample using the appropriate counting instrumentation. An isotopic determination is made of the radionuclides present and the activity of each. Summation of the individual activities is used to calculate the curie content of the processed container.

For cases where the primary method cannot be used, an alternate technique as set forth by Messrs. Bowman and Swindle[1] will be implemented. The alternate method entails using the dose rate of the packaged waste in order to calculate the curie content. The calculation considers the waste characteristics, geometry of the waste package, characteristics of the container and solidification media (if applicable), and the average gamma energy. For spent cartridge filters, this alternate method will be used to determine the curie content. The appropriate counting instrumentation is used to analyze samples taken from the process stream and the effluent to identify radionuclides present and the average gamma energy.

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[1] W. B. Bowman and D. L. Swindle, "Determination of the Content of Packaged Radioactive Waste Using Measured Dose Rates", Health Physics, Pergamon Press, Volume 31, 1976.