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VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS

June 1, 1981

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
Emergency Operations Facility (EOF)

Dear Mr. Denton:

As requested in Generic Letter 81-10 dated February 18, 1981, South Carolina Electric and Gas Company herewith provides the following information:

(1) task functions of the individuals required to report to the Technical Support Center (TSC) and EOF upon activation and for each emergency class (see attachment 1);

(2) descriptions of TSC instrumentation, instrument quality, instrument accuracy and reliability (see attachment 2);

(3) descriptions of TSC power supply systems, power supply quality, reliability and availability, and consequences of power supply interruption (see attachment 3);

(4) descriptions of the design of the TSC data display systems, plant records and data available and record management systems (see attachment 4);

(5) descriptions of the data transmission system to be installed between the TSC and control room (see attachment 5);

(6) description of data to be provided to the EOF (see attachment 6).

If you have any questions, please let us know.

Very truly yours,

T. C. Nichols, Jr.

T. C. Nichols, Jr.

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ATTACHMENT I

As described in section 5 of the Virgil C. Summer Radiological Emergency Plan, task functions of the individuals required to report to the Technical Support Center (TSC) upon activation for an alert, Site or General Emergency classification are as follows:

1. Emergency Director

The Emergency Director is the Station Manager. The primary alternate is the Assistant Station Manager. The Emergency Director is responsible for overall supervision of emergency operations onsite. The Emergency Director will base his operation from the Technical Support Center.

Additional duties are:

a. Verifies correct control room response to the emergency condition.

b. Initiates activation of additional plant personnel as indicated by the existing conditions based upon his analysis of the likely duration of the emergency.

c. Confirms the activation of appropriate emergency facilities.

d. Confers with the Supervisors in the Onsite Emergency Organization in regard to necessary additional facilities, equipment, supplies, or technical services which may be needed.

e. Determines which design and construction/repair problems and procurement activities will be turned over to the Offsite Emergency Organization.

f. Determines which functions in the Onsite Emergency Organization must be manned on a continuous 24 hour operations schedule for a protracted period and makes the appropriate assignments of plant personnel to assure adequate relief for continuous coverage.

g. In the case of a General Emergency the Emergency Director is responsible for making recommendations to the offsite authorities responsible for taking protective actions on behalf of the general public.

h. The Emergency Director has the authority to downgrade an Alert, Site Emergency, or General Emergency to a lower class.

2. Technical Support Supervisor

The Technical Support Supervisor in the Onsite Emergency Organization is the Technical Support Supervisor from the normal plant organization. The primary alternate is the plant Lead Engineer. Technical Support Supervisor will base his operations in the Technical Support Center. The Technical Support Supervisor and the personnel he supervises will be responsible for assessing plant status, developing recommendations and procedures for emergency plant operation, assisting in the resolution of operating requirements with the NRC representatives in the Technical

Support Center and provide technical support as required.

3. Radiological Assessment Supervisor

The Radiological Assessment Supervisor is the Health Physics Supervisor. The primary alternate is the Assistant Health Physics Supervisor. The Technical Support Center is the base of operations for the Radiological Assessment Supervisor. The Radiological Assessment Supervisor is responsible for determining the extent and magnitude of the radiological hazards associated with an emergency situation. After the Radiological Assessment Supervisor arrives at the site, he will be responsible for performing dose assessments both onsite and in the nearsite areas. Following the activation of the Off-Site Radiological Monitoring Coordinator, the offsite radiation monitoring and sampling of media will become the responsibility of the Off-Site Radiological Monitoring Coordinator.

4. Security Supervisor

The Security Supervisor for the Onsite Emergency organization is the Security Supervisor in the normal plant organization. The primary alternate is the Captain of the Security Force. The Security Supervisor will reside in the Technical Support Center. He will be responsible for the physical security of the plant, access control to the plant protected area and access control to plant vital areas.

5. TSC Communications Coordiantor

The TSC Communications Coordinator is an Engineer or Technician on the plant staff. The primary alternate will also be an Engineer or Technician on the plant staff. The TSC Communications Coordinator will relay status and assessment information to the offsite authorities responsible for coordinating and implementing offsite emergency measures. He will also provide the notification of offsite emergency response agencies should the Emergency Director subsequently revise the emergency classification.

Task functions of the individuals required to report to the Emergency Operations Facility (EOF) upon activation for a Site or General Emergency classification are as follows:

1. Emergency Control Officer

The Emergency Control Officer is the Vice President, Group Executive, Nuclear Operations. The primary alternate will be the Vice President, Group Executive Engineering and Construction. The Emergency Control Officer has the authority, management ability, technical knowledge, and procurement authority to commit corporate resources and to manage the overall emergency and recovery operation. The Emergency Control Officer is responsible for:

a. Overall management of SCE&G's response to emergencies.

b. Ensuring effective liaison with Westinghouse, Gilbert Associates, and other service and equipment contractors.

c. Determining if a recovery organization is required and if required the scope and functions of the recovery organization.

d. Activating additional corporate resources beyond those listed below to respond to emergencies.

2. Offsite Emergency Coordinator

The Offsite Emergency Coordinator will be the central coordinator for the offsite organization. The Offsite Emergency Coordinator will be the General Manager, Nuclear Operations. Ther primary alternate will be the Group Manager, Nuclear Services. The Offsite Emergency Coordinator will be responsible for:

a. Maintaining awareness of plant status and offsite consequences of the emergency.

b. Coordination between the Onsite Emergency Organization and the Offsite Emergency Organization, when activated, in regard to obtaining necessary additional facilities, equipment, supplies, personnel, or technical services.

c. Management and supervision of the activation and activities of the Emergency Operations Facility.

d. Serving as the primary onsite contact for Federal, State, and County radiological emergency response agencies which dispatch personnel to the plant vicinity. The Offsite Emergency Coordinator will periodically update these representatives on the status of the plant.

e. Keep the Emergency Control Officer and the Emergency Director apprised of the actions taken.

f. Informing the various emergency response groups when the recovery response phase organization is to be implemented.

g. Approve announcements to be released by the Media Coordinator and will contact the Emergency Director when participation of members of the onsite emergency organization in media briefings is desirable.

3. Technical Support Coordinator

The Technical Support Coordinator is the Group Manager, Nuclear Engineering and Licensing. The primary alternate is the Manager, Nuclear Engineering. The Technical Support Coordinator is responsible for design activities that are assigned to the Offsite Emergency Organization by the Emergency Director. The Technical Support Coordinator is responsible for:

a. Establishing necessary agreements with Westinghouse and Gilbert Associates to provide support for the Virgil C. Summer Nuclear Station on an emergency basis.

b. Provide contact with Westinghouse and Gilbert to resolve technical matters.

c. Staff the Emergency Operations Facility to ensure design and engineering activities are adequately staffed in a timely manner.

d. Provide input to the General Services Coordinator in regard to facilities needed in the Emergency Operations Facility to support technical support technical support activities.

e. Direct, coordinate, and approve engineering and design activities.

f. Ensure that design and design review activities are controlled and that cognizant portions of the emergency organization are aware of planned actions.

g. Coordinator the integration of Westinghouse, Gilbert, or other engineering personnel into the emergency organization.

Construction/Repair Coordinator

The Construction/Repair Coordinator is the Group Manager/Production Engineering/Q.C. and Construction. The primary alternate is Manager/Quality Control. The Construction/Repair Coordinator will base his operations from the Emergency Operations Facility. The Construction/Repair Coordinator is responsible for:

a. Staff the Emergency Operations facility to ensure construction/repair activities are adequately staffed in a timely manner.

b. Provide input to General Services Coordinator in regard to facilities or material required to support construction/repair activities.

c. Direct construction activities.

d. Ensure that construction activities are controlled and ensure that cognizant portions of the emergency organization are aware of planned activities.

e. Coordinate the integration of contractor personnel with other SCE&G personnel brought to the site.

4. Offsite Radiological Monitoring Coordinator

The Offsite Radiological Monitoring Coordinator is the Manager, Nuclear Health Physics and Environmental Programs. The primary alternate is a Corporate Health Physicist. The Offsite Radiological Monitoring Coordinator will base his operations from the Environmental Laboratory at the Parr Steam Plant. The Offsite Radiological Monitoring Coordinator will be responsible for:

a. Conducting radiation surveys and sampling of environmental media in areas outside of the exclusion zone.

b. Coordinating offsite surveys with other surveys conducted by local and Federal teams.

c. Retrieving the TLD's located offsite and determining cumulative population doses.

d. Reporting data to the Radiological Assessment Supervisor and to the EOF Coordinator.

e. If requested, arranging support for 24 hours per day offsite radiation monitoring capability.

f. Providing technical assistance in the evaluation of offsite and onsite radiological conditions including dose projections.

5. Media Coordinator

The Media Coordinator is the Coordinator of Nuclear Information. The primary alternate is The Director, Corporate Communications, Northern Division. The Media Coordinator will be responsible for disseminating information to the public via the media. He will report directly to the Offsite Emergency Coordinator. He will prepare and issue official press releases as approved by the Offsite Emergency Coordinator, arrange press conferences, and prepare technically accurate information for release to the public.

6. Security Coordinator

The Security Coordinator is the Manager of Security. The primary alternate is the Deputy Security Supervisor. Upon the establishment of the Emergency Operations Facility, the Security Coordinator will reside in the facility and report directly to the Offsite Emergency Coordinator. He will be responsible for coordinating site security force and necessary to maintain security, and for interfacing with local law enforcement officials as needed.

The Security Coordinator will be responsible for screening personnel for access, training outside personnel who need to go onsite, and issuing badges and dosimetry.

7. General Services Coordinator

The General Services Coordinator is the Manager of Purchasing, Production and Construction. The primary alternate is the Senior Buyer. The General Services Coordinator will be responsible to the Offsite Emergency Coordinator will be responsible to the Offsite Emergency Coordinator for all other needed support services and supplies. This will include typing and reproduction services, transportation, personnel accommodations, temporary offsite facilities and communications, meals, safety and first aid.

The General Services Coordinator will also be responsible for procurement and receipt of items requested by the Technical Support Coordinator and the Construction/Repair Coordinator.

8. EOF Communicator

The EOF Communicator will be the Emergency Planning Coordinator or his designated alternate. The Communicator will be responsible to the Offsite

Emergency Coordinator for the operation of the communications systems at the Emergency Operations Facility, and will act as liaison between EOF Coordinator and the other Centers.

ATTACHMENT 2

The Virgil C. Summer Nuclear Station Technical Support Center (TSC) is described in Section 7.7.3 of the FSAR. The TSC Computer Based Instrumentation and Data Display System is described in detail in Reference 1. Although this system was designed and bought prio to the issuance of NUREG-0696, "Functional Criteria for Emergency Re onse Facilities", it does meet this criteria with a few differences. These differences are tabulated in Appendix A.

The TSC parameters which are listed in Reference 1 are derived from the existing protection, control and post accident monitoring instruments and therefore have the same quality, accuracy and reliability that is required for their function in these existing systems. These signals, with appropriate isolation, are input to the TSC computer which is designed to meet the unavailability requirement of .01.

Meteorological and radiation monitoring data is collected by the Health Physics computer system located in the TSC. The system, which is being designed to perform the functions required by NUREG-0654 and R.G. 1.23 is based around a Hewlett Packard 1000 mini computer. Inputs from plant radiation monitors, selected flow meters, primary and secondary meteorologic towers and a pressurized ion chamber ring are logged by the HP-1000 on magnetic storage media. The HP-1000 transmits a set of this data to the TSC computer system and, in addition, performs the required Class A dose projection calculations.

The input data as well as the dose projection information is available for display on an HP-9845C computer in the TSC. This computer functions as an intelligent color display for the system. Color maps with plume overlays are a typical display capability.

Reference 1: WCAP-9725, "Westinghouse Technical Support C lex" June, 1980, D. V. Gennaro and J. L. Little.

APPENDIX A

Differences Between the Westinghouse Technical Support Complex Design Installed at Virgil C. Summer Nuclear Station and NUREG-0696 - Functional criteria for emergency response facilities.

Section 1.4 The SPDS shall be operational during all plant operating conditions, including accidents.

Response: The (W) PSSD (SPDS) is designed to perform during plant operating modes from cold shutdown through power operation. The refueling mode of operation was not specifically included in the design basis for the following reasons.

> The justification for requiring a safety parameter display system was for reasons of human factors considerations. The role of the operator is to detect and respond to incipient threats to plant safety which, during normal operating modes, can arise from a large number of sources, and in some cases, with consequential effects. The design of existing plant control rooms was deficient in that there was no concentration of critical plant parameters from which the safety state of the plant could be inferred and the maintenance of critical plant safety functions verified. The refueling mode of operation is a non-complex one in that the transients feasible are limited to reactivity excursions and possibly radioactive releases. The other systems in the plant are in a non-operational state and operating staff is not occupied with the plant control functions. It is felt that the current control room and plant instrumentation provides a more than adequate mechanism to respond to any possible transient.

Section 2.9 Technical Data and Data System

As a minimum, the set of type A, B, C, D and E variables specified in Regulatory Guides 1.97, Revision 2, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Palnt and Environs Conditions During and Following an Accident", shall be available for display and printout of the TSC.

Response: The definition of the data set for the TSC was not predicated upon the requirements of the Reg. Guide 1.97, which was not finalized at the time the TSC was designed, rather the data set was defined in order to support the tasks facing the personnel in the Technical Support Center: monitoring the safety state and functions in the plant, reviewing the accident sequence, determining mitigation strategies and evaluating the extent of damage to plant systems. A review of the TSC data set versus Reg. Guide 1.97 reveals some discrepancies as shown in Tabl 1. The TSC data system is in compliance with the Reg. Guide 1.97 parameter set to the extent that the plant currently is in compliance. Instruments which are added to meet the requirements of Reg. Guide 1.97, Rev. 2 will be added to the TSC data set.

TABLE 1

R.G. 1.97 Data
Type B, C, D and E Variables

Variable	Type	Comment
Boron Centration	B	Not measured directly
Hot Leg, Cold Leg Temperatures	B	Current ranges are 0-700°F
Radioactivity Level in Primary Fluid	C	Primary coolant letdown activity is monitored with letdown isolated available only through sample analysis
Coolant Gamma Spectrum	E	Currently available only through sample analysis
Reactor Coolant Pump Motor Current	D	Breaker position and reactor coolant flow used as a more direct measurement
Pressurizer Heater Current	D	Breaker position provided in place of current
Containment Sump Liquid Temperature	D	Not currently available
Reactor Shield Annulus Radiation Monitoring	E	Not required

Section 2.9 Data storage and recall capability shall be provided for the TSC data set. At least two hours of pre-event data and 12 hours of post-event data shall be recorded.

Response: The (W) Techncial Support Complex is an integrated data system for both the SPDS and TSC functions. Thirty minutes of pre-event data and twenty-four hours of post-event data storage is provided without the need for archiving. Archiving of the data for times beyond the initial twenty-four hours is possible without interruption of acquisition or system function.

Section 2.9 If the SPDS system in the control room is composed of multiple display units, multiple displays must also be provided in the TSC.

Response: The requirement for identical numbers of SPDS units in the technical support center as in the control room has no basis from human factors standpoint. The number of monitors in each location is determined from an analysis of the number and type of users in addition to the tasks they perform. In the Westinghouse design, which integrates the SPDS and TSC functions, the SPDS displays are a subset of the display system available on the TSC consoles. This was intentionally done for the purposes of providing improved communication between TSC personnel and control room personnel. The only exception is that the top level iconic display, used primarily for detection purposes, is implemented on a dedicated SPDS console in the TSC.

Section 5.5 SPDS Display Considerations

Also, where feasible, the SPDS should include some audible modification to alert personnel of an unsafe operating condition.

Response: It is felt thatthe requirement for an audible annunciator is somewhat arbitrary and might further compound a problem which already exists with respect to the large number of audible alarms used in control rooms today. Rather, the (W) PSSD utilizes a top level iconic display which provides an easily recognizable mechanism for indicating if a threat to plant safety develops.

Section 5.6 Design Criteria

The function of the SPDS is to aid the operator in the interpretation of transients and accidents. This function shall be provided during and following all events expected to occur during the life of the plant, including earthquakes. To achieve this function, the display system shall not only take adequate account of human factors-the man machine interface- but shall also be sufficiently durable to fucntion during and after earthquakes. Because of current technology, it may not be possible to satisfy these criteria within one SPDS system.

From an operating viewpoint, it is preferred that only one display system be used for evaluating the safety status of the plant. One display system simplifies the man-machine interface and thus minimized operator errors. However, in recognition of the restraints imposed by current technology, an alternative is to design the overall SPDS function with a primary and a backup display system: (1) the primary

PDS display would have high performance and flexibility and be human factored but need not be seismically qualified: and (2) the backup display system would be operable during and following earthquakes, such as the normal control room displays needed to comply with Reg. Guide 1.97. The display system (or systems) provided for the SPDS function shall be capable of functioning during and following all design basis events for the plant.

In all cases, both the primary SPDS display and the backup SPDS seismically qualified portion of the display shall be sufficiently human factored in its design to allow the control room operations staff to perform the safety status assessment task in a timely manner. Dependence on poorly human-engineered Class 1E seismically qualified instruments that are scattered over the control board, rather than concentrated for rapid safety status assessment, is not acceptable for this function. An acceptable approach would be to concentrate the seismically qualified display into one segment of the control board.

Response: In the intial conceptual design phases of the (W) PSSD in early January 1980, the question of seismic qualification was addressed.

It was decided that because of the serious human factors deficiencies imposed by a seismic design requirement that a CRT based display system with high availability and fault tolerant capability would provide the best possible solution to a clear human factors problem. Because of other regulatory requirements, primarily in the areas of Reg. Guide 1.97 qualifications and human factors improvements to existing control boards, it was felt that the control board with qualified indicators could provide an adequate backup to the SPDS for what was considered a low probability event: a concurrent accident and seismic event.

The Main Control Boards at Virgil C. Summer Nuclear Station have undergone extensive human factors evaluations and improvements. The class 1E seismically qualified post accident monitoring instruments are functionally located with their systems to provide effective control/display relationships for both normal and post accident modes of operation. These qualified post accident monitoring instruments are uniquely labelled and are provided with range and setpoint scale markings for quick and accurate identification and reading.

A separate panel grouping of class 1E seismically qualified instruments for use as a backup SPDS was considered and found unacceptable from a human factors standpoint.

ATTACHMENT 3

TSC POWER DESCRIPTION

The V. C. Summer Unit 1 Technical Support Center (TSC) can be powered from either the 480 volt substation XSW1DA2 or XSW1DB2 through a manual transfer switch located within the TSC. Distribution within the TSC consists of 480 volt and 120 volt panels.

The quality and reliability of the TSC power is consistant with that of the safety related power distribution system within the plant. That distribution systems parameters are as follows:

	When Supplied From	
	Off Site Power	Diesel Generator
Frequency	60HZ ± 0.5HZ	60HZ ± 0.5HZ
Voltage Range	95% to 103.5%	± 1%

These numbers do not consider transient conditions such as degraded off site voltage or diesel generation loading. During these conditions bus voltage will be lower.

In the event of loss of off site power the diesel generator will be connected to the bus within ten (10) seconds. Should the selected power train's diesel generator fail to start or unexpectedly trip while running, restoration of power from the alternate train will be made by utilizing the manual transfer swith in the Control Room.

The computer memory has an Integral Battery backup Power Supply so that an interruption of power will not result in the loss of any stored information.

ATTACHMENT 4

The following is a description of the plant records and data available, and record management systems for the Technical Support Center.

I. Procedures

- A. Administrative Procedures
- B. General Operating Procedures
- C. System Operating Procedures
- D. Emergency Operating Procedures
- E. Fire Protection Procedures
- F. Fuel Handling Procedures
- G. General Maintenance Procedures
- H. Health Physics Procedures

II. Final Safety Analysis Report including the Environmental Report, Technical Specifications, and Environmental Technical Specifications

III. Complete set of facility and system drawings

IV. Set of selected Tech. Manuals for major components and systems

V. Precautions, Limitations and Setpoints

VI. Title 10, Code of Federal Regulations

VII. State and County Radiological Plans

VIII. NRC Monthly and Yearly Operations Reports

IX. Other non-controlled information

- A. System Descriptions
- B. Mitigating Core Damage Manual
- C. Transient and Accident Analysis Manual
- D. Text Book

    1. Nuclear Theory
    2. Heat Transfer
    3. Fluid Flow
    4. Thermodynamics
    5. Chemistry
    6. Health Physics
    7. Radiation Shielding

X. Radiation Dose Projection Overlays and Maps.

Document Management a nd Control will be done in accordance with Station Administrative Procedure AP-301.1, "Document Control", for items I, II, III, IV, V, VI, and VII. Record Management and Control will be done in accordance with Station Administrative Procedure AP-301.2, "Nuclear Operations Records Control Procedure", for item VIII.

The TSC Data display systems are described in WCAP 9725, "Westinghouse Technical Support Complex", June 1980. D.V. Gennaro and J. L. Little.

ATTACHMENT 5

The Virgil C. Summer TSC Computer System is located in the Control Building adjacent to the Control Room, the Instrument Equipment Room, and the Plant Process Computer Room. The TSC Computer inputs are hardwired from the Instrumentation and Control Equipment and the Plant Process Computer inputs with appropriate isolation devices where required.

ATTACHMENT 6

The data available in the EOF will be the same data which is provided in the TSC. The method of data display in the EOF will be similar to the TSC. The detailed design of the EOF data transmission and display system is not complete at this time.