Thomas D. Gatlin
Vice President, Nuclear Operations
803.345.4342

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
LICENSE AMENDMENT REQUEST LAR-13-02396
REQUEST FOR NRC APPROVAL OF CHANGES TO THE RADIATION EMERGENCY PLAN

Dear Sir or Madam:

In accordance with the provisions of Section 50.54(q) and 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), South Carolina Electric & Gas Company, acting for itself and as agent for South Carolina Public Service Authority, hereby submits a proposed change to the Virgil C. Summer Nuclear Station's (VCSNS) Radiation Emergency Plan.

VCSNS Unit 1 is proposing a change that relocates the Technical Support Center (TSC) from its current location adjacent to the Main Control Room (MCR) to the basement of the Nuclear Operations Building (NOB). This new location is southwest and outside of the Unit 1 Protected Area and is approximately 1900 ft from the Unit 1 control room. This change has been evaluated under 10 CFR 50.54(q) and reductions in effectiveness have been identified; therefore the change requires prior NRC approval.

Attachment I is the technical analysis of the proposed change. Attachment II provides the TSC change justification and evaluation performed by VCSNS. Attachment III provides the mark-up copy of the Radiation Emergency Plan (EP-100 Revision 63). Attachment IV provides the retyped copy of the Radiation Emergency Plan (EP-100 Revision XX).

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated South Carolina Official.

This letter contains no new regulatory commitments.

SCE&G requests approval of the proposed changes by March 31, 2015, with an implementation date of 180 days after issuance of amendment, to permit program changes and training.

This proposed change has been reviewed and approved by both the VCSNS Plant Safety Review Committee and the VCSNS Nuclear Safety Review Committee.

If you have any questions about this submittal, please contact Mr. Bruce L. Thompson at (803) 931-5042.

I certify under penalty of perjury that the information contained herein is true and correct.

Executed on	Thomas D. Gatlin

BJD/TDG/ts

Attachments: IV

I. Analysis of Proposed Change
II. VCSNS TSC Change Justification/Evaluation
III. Radiation Emergency Plan (EP-100 Revision 63) (Mark-Up)
IV. Radiation Emergency Plan (EP-100 Revision XX) (Retyped)

c: K. B. Marsh
S. A. Byrne
J. B. Archie
N. S. Carns
J. H. Hamilton
J. J. Williams
W. M. Cherry
V. M. McCree
S. A. Williams
K. M. Sutton
S. E. Jenkins
NRC Resident Inspector
RTS (LAR-13-02396)
File (810.10)
PRSF(RC-14-0039)

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) Unit 1
DOCKET NO. 50-395
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ATTACHMENT I

Analysis of Proposed Change

1.0 DESCRIPTION

Virgil C. Summer Nuclear Station, Unit 1 (VCSNS) is proposing to change the location of the Technical Support Center (TSC) to a new location within the basement of the Nuclear Operations Building (NOB). The changes have been evaluated under 10 CFR 50.54(q) and reductions in effectiveness have been identified; therefore the changes require prior NRC approval.

2.0 PROPOSED CHANGE

2.1 Relocation of the Technical Support Center

The proposed new location for the TSC is in the basement of the NOB. This location is southwest and outside of the Unit 1 Protected Area and is approximately 1900 ft from the Unit 1 control room. The separation of the TSC from the control room (CR) will be approximately 9 to 13 minutes. This 9 to 13 minute timeframe is based on a person leaving the CR, processing through the Owner Controlled Area and the Protected Area Security Control Points, and entering the NOB to access the TSC.

The new facility design and layout provides a larger facility with updated audio/visual equipment to establish and maintain command and control of on-site evaluations and mitigation strategy development. Features of the new TSC include a dedicated emergency diesel generator, additional telephones, and computer resources. The number of TSC phone lines will be increased from 15 to 46 and the number of networked personal computers will be increased from 13 to 32. This increase will allow the ERO to access plant data, drawings, procedures, and other computer applications. The TSC is also designed to meet the protected envelope functional requirements for habitability and ventilation similar to the Control Room.

Attachment II provides the Licensee's justification and evaluation for the proposed change to the relocate of TSC.

3.0 BACKGROUND

In 2011, the NRC amended 10 CFR 50.54(q) to require the use of the license amendment process in 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," when applying for prior NRC approval of those changes determined to be a reduction in effectiveness.

The Unit 1 Technical Support Center (TSC) is currently located within the Control Building adjacent to the Unit 1 Control Room. The TSC is proposed to be relocated to the Nuclear Office Building basement. The new TSC will address the limited work area in the current TSC and will support the eventual common TSC for a multiple unit site.

4.0 TECHNICAL ANALYSIS

4.1 Relocation of the Technical Support Center

The proposed change to relocate the TSC is a reduction in effectiveness from the current emergency plan requirements. Table 1 provides a direct comparison between the capabilities of the current TSC facility and proposed new facility.

Table 1 TSC Resource Comparison

Resource	Current Facility	Proposed Facility
ERO Positions Assigned	TSC - 13 VCS, 6 NRC	TSC - 32 VCS, 12 NRC with Back-up OSC - ~15 VCS
Square Footage (total)	~2,500 sq ft	~7000 sq ft
Rest Rooms	Facilities shared with Control Room for men and women	Full men's and women's facilities with showers
Break/Serving Area	Kitchenette shared with Control Room	Break Area with tables and serving area, ice, water, refrigerator, etc.
Work Stations (total)	13	44
Telephones (PBX)	13	44
Telephones (Satellite)	1	1
Telephone (Dedicated Lines)	1	1
Radios	Hand-held only	10 desk top for dedicated positions and hand-held
Computers/Data Connections	13	32 with 9 in Back-up OSC
Projectors (A/V System)	2	5 with additional 15 A/V display capabilities in adjacent work areas
Back-up OSC	None	~880 sq ft with 9 work stations and command table
NRC Area	8 x 8 cubicle	~390 sq ft with 4 work stations and conference table

The new TSC will continue to meet the intent and guidelines of NUREG-0696, "Functional Criteria for Emergency Response Facilities" and NUREG-0737 "Clarification of TMI Action Plan

Requirements" with the exception of the TSC location. The new TSC will be located within the basement of the NOB. This location is outside of and southwest of the Unit 1 Protected Area and is approximately 1900 feet from the Unit 1 control room. The distance between the CR and the TSC is about a 9 to 13 minute walk. This 9 to 13 minute timeframe is based on a person leaving the CR, processing through Owner Controlled Area and Protected Area Security Control Points, and entering the NOB to access the TSC. The proposed TSC location does not lend itself to face-to-face communications with the Unit 1 control room as recommended by NUREG-0696, section 2.2. The location of the TSC is an alternative method to NUREG-0696 requiring the TSC to be within two minutes of the control room and that there be no major security barriers between the two facilities.

While the proposed location of the new TSC does not allow for direct face-to-face communications between the Shift Supervisor in the CR and the Emergency Director in the TSC, adequate communications lines and designated positions will ensure continued and effective communication. The site currently demonstrates the effectiveness of the communications lines and designated positions as a substitute for face-to-face communications during emergency plan drills with the VCSNS Simulator CR and the current TSC. Therefore, relocation of the TSC to the new NOB will not prevent VCS from meeting the intent of the guidance in NUREG-0696.

The new location also provides for improved off-hours staffing capabilities since responders will not have to process through Owner Controlled or Protected Area Security access locations to reach the TSC. The relocation of the TSC will improve activation time and the capability for transfer of critical tasks from the Control Room. The location of the TSC will also provide managerial and technical support to plant operations personnel via the communication links during emergency conditions without congesting the control room. The new TSC will also have access to the plant computer and Safety Parameter Display System (SPDS) displays. There is not an anticipated need to traverse from the TSC to the CR therefore the Protected Area security barrier will not create any adverse impact on the function of the new TSC being located outside of the Protected Area. Should the need arise, security personnel are assigned in the TSC to enhance the movement of personnel between the TSC and the control room.

The working space is considerably larger than the existing facility and will reduce current crowded working conditions (reference Table 1). This change will strengthen the TSC command and control function by allowing the TSC ERO a larger, better-designed working area. The TSC is sized to accommodate a minimum of 40 personnel and their supporting equipment. This includes provisions for at least three NRC representatives. The larger work area facilitates additional state of the art equipment for TSC personnel to perform their ERO functions. The new facility will strengthen the ERO by creating a centralized onsite command and control organization and a single evaluation and mitigation decision structure for the entire site.

The TSC was constructed to meet the 2006 International Building Code (IBC). The superstructure of the facility was designed for IBC site class D, design category C, Business occupancy category II. The TSC and NOB structure are fully equipped with sprinklers and constructed with non-combustible construction. The basement ceiling systems, mechanical ductwork, plumbing, piping, sprinkler piping, and electrical systems are seismically braced throughout the TSC. Access to the TSC will be controlled through two direct points of ingress/egress, on the north and south ends of the basement (central and south portions of the

NOB, respectively). These points do not open directly to the exterior of the building, but are accessed through stairways or elevators from the upper floors. Control of personnel entering will be done using access card readers connected to site security access control computers.

The TSC was designed to meet the protected envelope functional requirements for habitability and ventilation similar to the Control Room as identified in NUREG-0696 and Section II.B.2 of NUREG-0737. The HVAC system is designed with High Efficiency Particulate Air filters and charcoal filters with a mixed air capability from both inside and outside the facility and exterior. The system when placed in emergency mode, via a designated button in the TSC command area, closes specified motorized dampers, disables EF-1 (rest rooms exhaust fan), and energizes FFU-1 (filtered HVAC). Once this takes place, the TSC pressurizes to a minimum of 0.125 inwc (inch of water column). An alarm panel is located within the command area of the TSC that will alert personnel of a change in pressurization which causes the positive pressure to fall below 0.125 inwc.

Although these changes are reductions in effectiveness, the changes will continue to meet the requirements of 10 CFR 50.47(b) and 10 CFR 50 Appendix E. The TSC will continue to maintain adequate facilities and equipment. The new TSC will ensure the station's emergency response will protect the public health and safety while monitoring, evaluating, and developing mitigation strategies in response to the emergency conditions.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements / Criteria

10 CFR 50.47(b) and 10 CFR 50 Appendix E establish emergency planning standards that require 1) adequate staffing; 2) satisfactory performance of key functional areas and critical tasks; and 3) timely augmentation of the response capability. The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met. The proposed change has also been evaluated in accordance with 10 CFR 50.54(q) and results in a reduction in the effectiveness of the emergency plan and therefore, prior NRC approval is required. The proposed change, will continue to meet the requirements of 10 CFR 50 Appendix E and the planning standards of 10 CFR 50.47(b).

5.2 No Significant Hazards Consideration

VCSNS has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No. The proposed change to the VCSNS emergency plan does not impact the physical function of plant structures, systems, or components (SSC) or the manner in which SSCs perform their design function. The proposed change neither adversely affects accident

initiators or precursors, nor alters design assumptions. The proposed change does not alter or prevent the ability of SSCs to perform their intended function to mitigate the consequences of an initiating event within assumed acceptance limits. No operating procedures or administrative controls that function to prevent or mitigate accidents are affected by the proposed changes. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No. The proposed change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed or removed) or a change in the method of plant operation. The proposed change will not introduce failure modes that could result in a new accident, and the change does not alter assumptions made in the safety analysis. The proposed change to the location of the TSC is not an initiator of any accidents. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No. Margin of safety is associated with the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public. The proposed change does not impact operation of the plant or its response to transients or accidents. The change does not affect the Technical Specifications or the operating license. The proposed change does not involve a change in the method of plant operation, and no accident analyses will be affected by the proposed changes. Additionally, the proposed change will not relax any criteria used to establish safety limits and will not relax any safety system settings. The safety analysis acceptance criteria are not affected by these changes. The proposed change will not result in plant operation in a configuration outside the design basis. The proposed change does not adversely affect systems that respond to safely shut down the plant and to maintain the plant in a safe shutdown condition. The emergency plan will continue to activate an emergency response commensurate with the extent of degradation of plant safety.

Based on the above, SCE&G concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of “no significant hazards consideration” is justified.

6.0 ENVIRONMENTAL CONSIDERATIONS

The proposed change to the Radiation Emergency Plan maintains the environmental bounds of the current environmental assessment associated with the VCSNS Unit 1. The proposed change will not affect plant safety and will not have an adverse effect on the probability of an accident occurring. The proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure.

The construction of the NOB is now complete. The NOB was designed in accordance with State and local Uniform Building Codes. Therefore, proposed changes do not result in changes to land use or water use, or result in changes to the quality of quantity of non-radiological effluents. No changes to the National Pollution Discharge Elimination System permit are needed. The addition of a diesel generator was reviewed to ensure compliance with the State of South Carolina's air regulations and was determined to have no impacts on the air or ambient air quality. There are no impacts to historical and cultural resources. Therefore, no changes to or different types of non-radiological environmental impacts are expected as a result of these changes.

In conclusion, the proposed change to the Radiation Emergency Plan will not have an adverse impact on the environment.

7.0 PRECEDENCE

This request is similar in nature to the other requests authorized by the NRC for Clinton Power Station [ML061920575, ML063530752, and ML070540270] and Three Mile Island Nuclear Station, Unit 1 [ML023460148]. However, the amended rule in 2011 changed the language to specify that licensees must use the license amendment process in 10 CFR 50.90 for changes evaluated as a potential reduction in effectiveness.

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) Unit 1
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ATTACHMENT II

TSC LAR Change Justification/Evaluation

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) Unit 1
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ATTACHMENT III

Proposed Radiation Emergency Plan (EP-100 Revision 63) (Mark-Up)

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) Unit 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12

ATTACHMENT IV

Proposed Radiation Emergency Plan (EP-100 Revision XX) (Retyped)

VCS EP-100 (TSC) LAR Change Justification/Evaluation

TITLE: EP-100, Radiation Emergency Plan, Rev xx NRC Submittal (TSC)	**DATE:** 9/04/2014

DESCRIPTION OF PROPOSED CHANGE:

The Emergency Plan is being revised to relocate the Technical Support Center (TSC) to the basement of the Nuclear Operations Building. The Changes to the Emergency Plan are being made to Annex 1 Section 4.1 B. A 10 CFR 50.54 (q) evaluation was performed and recorded by VCS under VCS #: E2012-013 Revision 2.

DESCRIPTION AND REVIEW OF LICENSING BASIS AFFECTED BY THE PROPOSED CHANGE:

NUREG-0717, SER related to V. C. Summer Nuclear Station Unit 1, Supplements 2 and 3 require and state VCS has a radiological emergency response plan that includes elements of NUREG-0654, Revision 1 (1979 criteria), NUREG-0696, 10 CFR 50.47, and 10 CFR 50 Appendix E and will provide adequate planning basis for an acceptable state of emergency preparedness and meets these requirements. EP-100 Revision 5 is the revision in which the latest Safety Evaluation Report (SER) was issued in August, 1982. Since this revision numerous other revisions have been made under the 10 CFR 50.54(q) process. This revision maintains the intent, purpose, and function of the emergency plan as evaluated up to the current Revision 63.

DESCRIBE HOW THE PROPOSED CHANGE COMPLIES WITH RELEVANT EMERGENCY PREPAREDNESS REGULATION(S) AND PREVIOUS COMMITMENT(S) MADE TO THE NRC:

NUREG-0654, 10 CFR 50.47, and 10 CFR 50 Appendix E provide regulatory guidance and requirements for a radiological emergency plan content. This revision does affect how the regulatory or commitment requirements will be met. Changes affecting the requirements of 10 CFR 50.47 and 10 CFR 50 Appendix E are evaluated in this evaluation. This revision also changes the means and methods in which NUREG-0696 requirements will be met due to building a new TSC and relocating the facility. The revision also affects the Security and Emergency Plan interfaces in accordance with 10 CFR 73.58, which was evaluated under site procedure SAP-0163 by site Security personnel and there is no adverse impact on the Security Plan or interface.

More specifically 10 CFR 50.47 (b) (8) requires adequate emergency facilities and equipment to support the emergency response are provide and maintained. The relocation of the TSC is evaluated in more detail in Enclosure A of this document. This evaluation will provide the justification as to how the relocation of the TSC will continue to meet the requirements of these regulations.

DESCRIPTION OF IMPACT OF THE PROPOSED CHANGE ON THE EFFECTIVENESS OF EMERGENCY PLAN FUNCTIONS:

Enclosure A of this evaluation provides the detailed evaluation and justification of the changes. These changes were identified in the 10 CFR 50.54 (q) evaluation as a reduction in effectiveness and require prior approval by the NRC.

EVALUATION CONCLUSION:

Answer the following questions about the proposed change.

1. Does the proposed change comply with the requirements of 10 CFR 50.47(b) and 10 CFR 50 Appendix E?	☒ YES ☐ NO
2. Does the proposed change maintain the effectiveness of the emergency plan (i.e., no reduction in effectiveness)?	☐ YES ☒ NO

Enclosure A, Technical Support Center Relocation Justification/Evaluation

Justification: Function: The Unit 1 Technical Support Center (TSC) is currently located within the Control Building adjacent to the Unit 1 Control Room. The TSC is proposed to be relocated to the Nuclear Office Building basement. The new TSC will address the limited work area in the current TSC and will support the eventual common TSC for a multiple unit site.

The new TSC facility is designed to meet the intent and requirements of NUREG-0696 "Functional Criteria for Emergency Response Facilities" and NUREG-0737 "Clarification of TMI [Three Mile Island] Action Plan Requirements". This location departs from the guidance in NUREG-0696 in three areas: 1) that the TSC be located near the Control Room, 2) that the walking time from the TSC to the Control Room not exceed 2 minutes, and 3) that there be no major security barriers between the TSC and the Control Room. However, with improved electronic communication capabilities and technologies, face to face interactions between the TSC and Control Room personnel are no longer necessary to meet the intent of NUREG-0696 guidance. VCS drills are currently conducted in a manner that does not afford the face to face interactions, due to the Simulator being in the training building, outside the Protected Area. Therefore, relocation of the TSC to the new NOB will not prevent VCS from meeting the intent of the guidance in NUREG-0696.

When activated, the TSC functions include:

- Support for the affected Control Room's emergency response efforts
- Continued evaluation of event classification
- Assessment of the plant status and potential offsite impact
- Coordination of emergency response actions within the Protected Area (PA)
- Communication with the NRC via ENS
- Activation of the Emergency Response Data System (ERDS) or ensuring that it is activated

Location: VC Summer (VCS) has built a new Nuclear Operations Building (NOB) and within its basement is a proposed new Technical Support Center (TSC). The NOB and proposed TSC will be located outside of and southwest of the Unit 1 Protected Area. This location is approximately 1900 ft. from the Unit 1 Control Room. The separation of the TSC from the Control Room will be approximately 9 to 13 minutes (under normal walking conditions) and includes processing time through Owner Controlled Area and Protected Area Security Control Points. The basement of the NOB is dedicated only for the TSC. The TSC access is controlled via security card access readers or key locked doors. Designation of the access authorization levels is the responsibility of VCS Emergency Preparedness and is controlled by Corporate Security via security access request and approval process.

During a radiological emergency requiring an emergency declaration, Security procedures and actions will not inhibit access through the Owner Controlled and Protected Area access systems. Thus these systems have a negligible impact on travelling from the TSC to the Control Room or other portions of the plant. In the event of a hostile action, plant procedures provide guidance for the Emergency Response Organization (ERO) to activate utilizing alternate facilities, outside of potential hostile action areas, and provide procedure guidance for moving personnel under protective measures. The relocation of the TSC will not impact the use of the alternate facilities.

The VCS Emergency Plan describes extensive communications capabilities between the TSC and the Unit 1 Control Room, OSC, and EOF. These communications capabilities provide a variety of methods to ensure reliable communications and compensate for the TSC being located outside of the Protected

Area. NUREG-0800 includes a statement that advanced communication capabilities may be used to satisfy the 2-minute travel time. The communication capabilities between the Control Room and the new TSC are a suitable alternative to the two minute travel time. Management interaction and technical information exchange will be accomplished using plant computer and communication (telephone, radio, etc.) systems that provide means to directly contact the Control Room. The capabilities to review and evaluate technical data, such as plant parameter display information, are provided in the TSC from real-time systems which receive their inputs from the same sources as the Control Room, but are communicated on a different network. Access to procedural information and plant reference material will continue to be available in the new TSC. The use of technology to access and evaluate plant parameters significantly reduces the need for face-to-face interactions described in NUREG-0696.

In the event that TSC personnel are to travel to the Control Room during a radiological release or if a release is imminent, the TSC has storage capabilities for maintaining protective clothing and survey instruments that will be needed to ensure dose received during travel is as low as reasonably achievable. The location of the TSC also affords the opportunity to use multiple routes to reach the Control Room to minimize exposure to a potential plume or release path.

Staffing and Training: The proposed TSC is designed to support an emergency for VCS Unit 1 and in the future Units 2 and 3 or any combination thereof. The Unit 1 TSC requires hosting equipment and work space to support approximately sixteen ERO positions. The proposed TSC will host approximately thirty-five ERO positions, including designated work space for the NRC Residents. This organization will have access to and can evaluate emergency conditions for Unit 1 using plant computer systems to provide operational parameters and meteorological data. The organization structure can maintain communications with the Control Room, the Operational Support Center, and the Emergency Operations Facility. This change will also strengthen the TSC command and control function by allowing the TSC ERO a larger, better designed working area.

The Nuclear Operations Building upper floors house Engineering, Site Management, and other plant organizations and personnel assigned to the ERO to augment Shift Staffing in an emergency. This close proximity will facilitate timely activation of the TSC during normal work hours. This location also provides for improved off-hours staffing capabilities since responders will not have to process through Owner Controlled and Protected Area security access systems to reach the TSC. The relocation of the TSC will make activation timelier and improve the capability for transfer of critical tasks from the Control Room. ERO Training will be maintained as currently described in the emergency plan and implementing procedures. Personnel training specific to their ERO assignments will be modified to incorporate changes based the relocation of the TSC and the new work station arrangements. Emergency drill training is currently conducted using the TSC in the Unit 1 Control Building (adjacent to the actual Control Room) and the simulator Control Room located in the Nuclear Learning Center, without the ability to have face to face communication between TSC and Control Room personnel. These drills have successfully demonstrated the ability to implement the Emergency Plan with physically a separated Control Room and TSC.

Size: The new TSC command area and adjacent work areas total approximately 7,000 square feet as compared to the current TSC space of approximately 2,500 square feet. This provides more than adequate spacing and exceeds 75 square foot /person required in NUREG-0696. The TSC will be designed around a central command center with partitioned work spaces on its perimeter for designated support groups. Each work space has full viewing of the command area through glass store front partition walls. The facility (basement) also includes restrooms with shower facilities, a break room (refrigeration, ice and beverage, and serving areas), storage areas, and communications/network, audio/visual equipment, copier/printer, electrical and mechanical rooms supporting only the new TSC area. An established designated boundary will ensure the TSC portions of the basement are protected by the HVAC/Recirculation-Filtration envelop.

The new facility will provide larger individual work spaces and designated discipline work areas and conference areas as compared to the existing TSC. The command area will increase from nine work stations to twenty-two work stations. The engineering area will expand from two shared work spaces to eleven work spaces. The facility also includes two separate work areas that each support three work stations. The TSC will also include a designated NRC support area which expands from one work space to four work spaces and a conference area directly adjacent to the command area and separated by a glass partition wall. The TSC will include a back-up Operational Support Center (OSC) in an adjacent work area with nine work stations and a large command center table. This area is separated from the command area by glass partition walls. If not needed for as a back-up OSC; this space can be utilized by the TSC staff in the response to an emergency.

With larger work areas, additional technology (computers and telephones) has been provided to the TSC personnel. The new TSC will allow personnel to access plant data, drawings, procedures, and other computer applications more timely and effectively from individual work stations. Technology in the new TSC will also include multiple overhead projection systems, large screen displays, teleconferencing, real time system monitoring through plant computer networks, and radio, PBX, and satellite phone communication systems.

Structure: The TSC will be located in the basement of the Nuclear Operations Building, below two upper structural floors which are designed and constructed to the 2006 International Building Code. Access to the TSC will be controlled through two direct points of ingress/egress, on the north and south ends of the basement (central and south portions of the NOB, respectively). These points do not open directly to the exterior of the building, but are accessed through stairways or elevators from the upper floors. The basement of the NOB is dedicated only for the TSC. The TSC access is controlled via corporate security card access readers or key locked doors. Designation of the access authorization levels is the responsibility of VCS Emergency Preparedness and is controlled by Corporate Security via security access request and approval process. The NOB is located within the Exclusion Area of the site which is patrolled and controlled by onsite security forces.

The basement of the NOB, which is where the TSC will be housed, is constructed of 10-12" thick concrete retaining walls and is located 16 feet below finished exterior grade. The floor structure of the NOB above forms a cap above the space. This cap is constructed of a composite beam and concrete slab construction. The TSC as well as the NOB structure above constructed with non-combustible material and are protected by a sprinkler system. The superstructure of the facility is designed to International Business Code (IBC) site class D, design category C, Business occupancy category II. The basement ceiling systems, mechanical ductwork, plumbing piping, sprinkler piping, and electrical systems are seismically braced throughout the TSC.

Habitability: The TSC is designed to meet the protected envelope functional requirements for habitability and ventilation similar to the Control Room as identified in NUREG-0696 and Section II.B.2 of NUREG-0737. The HVAC system is designed with High Efficiency Particulate Air filters and charcoal filters with a mixed air capability from both inside and outside the facility. The system when placed in emergency mode, via a designated button in the TSC command area, closes specified motorized dampers, disables EF-1 (rest rooms exhaust fan), and energizes FFU-1 (filtered HVAC). Once this takes place the TSC pressurizes to a minimum of 0.125 inches water column (inwc). An alarm panel is located within the command area of the TSC that will alert personnel of a change in pressurization which causes the positive pressure to fall below 0.125 inwc.

The HVAC design includes the following:

The mechanical ventilation for the TSC area is designed to provide 4000 cubic feet per minute (cfm) of outside air prior to isolation. When the system is placed in emergency mode, a total of 4000 cfm will be filtered with charcoal and HEPA filtration. While in emergency mode, 3200 cfm of the 4000 cfm will be

outside air and the remaining 800 cfm will be recirculated from the TSC area while maintaining a 0.125 inch positive pressure.

During the normal mode of operation, the system provides conditioned airflow to the terminal boxes serving the spaces. As the space temperatures are satisfied, the dampers on the boxes start to close causing the supply fan to slow down. The speed of the supply fan will vary depending on the building load. The return air damper modulates to maintain a positive pressure differential between the TSC boundary area and the outdoors. A pressure monitor located in the TSC to provides positive pressure verification.

The TSC area is placed in the emergency mode from a push button located in the TSC. When the system is in emergency mode, the outside supply and return dampers reposition and direct flow to the filtered flow unit (FFU). The FFU has Minimum Efficiency Rating Value (MERV) 8 pre-filters, MERV 15 charcoal filters, and MERV 16 final filters and works with the normal air handling unit to provide filtered air and maintain a a positive pressure differential between the TSC boundary area and the outdoors.

1. TSC ventilation air inlet and recirculation flow rates - The system design provides 3200 cfm of outside air make-up (unfiltered) to the TSC prior to isolation, after isolation 3200 cfm (filtered). An additional 800 cfm of air is recirculated through the charcoal cleanup unit.
2. HEPA filter and charcoal absorber fission product removal efficiencies - The system provides 99% removal efficiency for particulates and 90% decontamination efficiency for radioiodine.
3. TSC unfiltered air in-leakage rate - The in-leakage assumed for the TSC dose calculation is 500 cfm of unfiltered air after isolation.
4. Atmospheric dispersion factors (X/Q values) at TSC air intake - The X/Q values at the TSC air intake are as follows, with the release assumed at ground level from the location of the plant vent. These values which bound the containment shell ground level release are calculated using ARCON96 based on two years of meteorological data:

0-2 hr	2.33E-05 *sec/m3*
2 - 8 hr	1.84E-05 *sec/m3*
8 - 24 hr	7.65E-06 *sec/m3*
24 - 96 hr	6.00E-06 *sec/m3*
96 -720 hr	4.58E-06 *sec/m3*

5. TSC occupancy factors - The standard Control Room occupancy factors from Section 4.2.6 of Regulatory Guide 1.183, July 2000, are assumed for the TSC:

0-24 hr	1.0 (100%)
24 - 96 hr	0.6 (60%)
96 - 720 hr	0.4 (40%)

6. TSC free air volume - The TSC design is approximately 72' by 130', with an additional 14' by 40' area provided as a potential eating area. The floor area does not include those vestibule areas that function as air locks between stairways and the TSC, but does include areas that contain the ventilation system fans and filter plenums. The floor to ceiling height is 14.5'. These dimensions provide a volume of 143,840 ft3 for the dose evaluation of the facility. The TSC free air volume will be no greater than 143,840 ft3.
7. Occupant breathing rate - The breathing rate of 3.5E-4 m3/sec for the TSC occupant is assumed for the duration of the accident. This rate is consistent with that for the control room operator in Section 4.2.6 of Regulatory Guide 1.183, July 2000.
8. Description of the ventilation design - The ventilation design for the TSC is modeled after Figure 1 of Regulatory Guide 1.52, Revision 3, June 2001, with minor deviations. Neither the moisture

separators nor the heater are expected to be required in the charcoal unit. The ventilation equipment will be located within the TSC ventilation envelop, within a mechanical room.

During normal operation the system functions as a normal ventilation system providing temperature control, filtration, and some amount of outside air make-up. During emergency recirculation conditions a charcoal absorber unit is placed in service. This unit is intended to provide filtration of part of the air being recirculated in the TSC as well as the outside air make-up for the TSC. During the emergency recirculation mode of operation the system maintains a 1/8" wc positive pressure in the TSC relative to outside, by admitting 3200 cfm of outside air. This flow of 3200 cfm provides enough ventilation (filtered fresh air) for at least 100 people. The charcoal absorber unit filters an additional 800 cfm of air that is recirculated from the TSC. There is also an unfiltered recirculation rate of 15,000 cfm, but this has no bearing on the radiological analysis.

The HVAC system is not designed as Seismic Category I and is not provided with redundant fans, filters, or power supplies, as allowed by the NUREG-0696 requirements for the TSC. Each TSC entrance is provided with a weather sealed doorway between stairways and the TSC Command Area.

Exposure to direct radiation from a radiological release is negligible due to the TSC being located in the basement and beneath the two upper floors of the NOB. Based on current Unit 1 TSC dose calculations and taking the conservative approach that the new TSC will be further away from the plant and in the basement of the Nuclear Operations Building, the expected dose rates and TEDE accumulated dose is expected to be less than 5 Rem.

Radiological monitoring will be provided using a portable Beta Continuous Air Monitor (CAM). The monitor will be mounted on a portable cart and rolled into the hallway immediately adjacent to the TSC Command Area and within the HVAC envelop. The monitor will meet the follow specifications:

Operating System	Microprocessor-based central readout device, mated to a detection head with real time gamma background subtraction using two detectors
Detector[s]	2 in. diameter sealed proportional Window: 2 to 3mg/cm2 mica
Efficiency	**Radial Sampling Head: 8.5% 60Co, 17% 90Sr/90Y (nominal)** Inline Sampling Head: 6.4% 85Kr, 4.4% 133Xe (nominal) Noble Gas Sampling Head: 5.75% 60Co, 12% 90Sr/90Y (nominal)
Airflow Rate	Display Unit: 8.5 to 113L/min., 0.5 to 6.8 cfh (0.3 to 4.0 cfm) Pump: 56L/min. (2.0 cfm) nominal at STP with clean filter
Display	Two rows x 20 characters high visibility vacuum fluorescent, percentage of Alarm 40-element LED bar graph
Status Indicators	Front panel lights display READY and MALFUNCTION conditions, red alarm strobe light visual warning, and sonalert audible warning

Communications and Data Systems: The TSC will have voice, data, and radio communication services. These services will be distributed from a dedicated communication room allowing independence from the distributed network services in other parts of the building. Additionally, the TSC will have radio and fiber optic capabilities that can communicate with the Control Room, OSC, EOF, and offsite emergency agencies, if needed.

Network Transport (feeds to the building): Two network transport feeds come to the TSC from the Access Authorization Portal currently, which is redundantly fed from the corporate network. The system will be upgraded in the future providing two 10 gig feeds, one from Fiber Hut (FH) 2 and the other from FH5. FH2 and FH5 will have diverse 10 gig feeds, one from 1401 Main St. Columbia, SC and the other from the 24x7 data center in West Columbia, SC.

Dual Independent Distribution switches: The 2 transport feeds are connected to two distribution switches, DistSNOBA and DistSNOBB. The distribution switches have dual power supplies. One power supply is connected to an emergency power source and the 2nd power supply is connected to the building UPS system; the switch can operate on one power supply. Each power supply is running at half capacity and configured to take over should one of them fail or lose power.

Access Switches: There are two access switches in the TSC communication room, SW1SNOBB and SW2SNOBB. All PCs, printers, building security systems, AV systems, building management systems, IP Phones, and IP radios are connected to the access switches. Each access switch has an uplink to the distribution switch, one to DistSNOBA and the other to DistSNOBB.

Each access switch has two supervisor modules. These modules contain the switch configuration and a single 10 gig uplink to the distribution switch. One is active and the 2nd one is in standby mode. Should the active one fail or have a problem, the second supervisor module takes over the management and operation of the switch.

Each access switch has dual power supplies; one power supply can run the switch. Both power supplies are powered up, running at half capacity and configured to take over should one of them fail or lose power. One power supply is connected to an emergency power source and the 2nd power supply is connected the building UPS system.

With the redundancy of the TSC communication services, there is no one point of failure that will interrupt services.

Instrumentation, Data System Equipment, and Power Supplies:

The HVAC system is controlled by the Building Management system which provides system diagnosis and alarms to site facilities maintenance personnel.

The facility has normal and emergency 480 volt power distribution equipment on the ground floor elevation which feed an automatic transfer switch (ATS) that supplies power to the building emergency power distribution panels. The main emergency power distribution panel feeds a 480 volt panel in the basement (TSC) electrical room that feeds additional panels that supply power for lighting, HVAC equipment, the uninterruptible power system (UPS) system, and other 480 volt loads. Step down transformers are located in the basement to supply panels that feed receptacles and other 120 volt and 208 volt loads.

In the event of a loss of normal power the ATS will transfer to the emergency diesel generator. The generator feeding the emergency power system is a 550 KW diesel engine generator with adequate capacity to supply emergency power loads in the TSC as well as the other emergency loads in the building. Lighting and HVAC systems in the TSC are on emergency power. 120 volt receptacles are fed from emergency power panels and receptacles for critical equipment and computers are fed from the UPS system. The TSC emergency generator powers TSC loads and limited loads within the remaining NOB to allow access safely into the TSC. These loads include, but are not limited to, emergency lighting, elevator power, and security systems.

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REVISION 63

SAFETY RELATED

Section 4: Emergency Facilities and Equipment

4.1 Unit-Specific Emergency Facilities

A. Control Room

The Control Room, located in the Control Building is designed to be habitable under accident conditions and shall serve as the onsite Emergency Control Center. Emergency lighting, power, air filtration, ventilation system and shielded walls enables the operators to remain in the Control Room to ensure that the reactor will remain in a safe condition. In addition, the operators shall be able to evaluate situational conditions and relay pertinent information and data to the appropriate onsite and offsite agencies and organizations during all emergencies. To ensure that shift personnel and other personnel assembled at the location can remain self-sufficient, emergency equipment and supplies shall be stored in, or near, the Control Room. The exact location and the type and quantity of emergency equipment and supplies available are specified in EPP-103, Emergency Equipment Checklist.

B. Technical Support Center (TSC)

The TSC, located in the ~~Control~~ basement of the Nuclear Operations Building is designed to be habitable under accident conditions and shall serve as the onsite Emergency Control Center after relieving the Control Room of command and control. Emergency lighting, power, air filtration, ventilation system, and below earthen grade~~shielded~~ walls enable the responders to remain in the TSC. In addition, the responders shall be able to evaluate situational conditions and relay pertinent information and data to the appropriate onsite and offsite agencies and organizations during all emergencies. This facility is located ~~inside~~ outside the Unit 1 Protected Area approximately 1900 ft from the Control Room and provides the ability to respond and activate the facility in a timely fashion.

C. Operational Support Center (OSC)

The OSC is located on the first floor in the Auxiliary Service Building within the Protected Area and is separate from the Control Room. The OSC is the location from which survey, operations, and repair teams are dispatched into areas of the plant. It is the staging area for individuals who may be assigned to first aid, search, survey, rescue, repair, and corrective action teams.

The OSC Supervisor is responsible for managing the activities in the OSC including:

- Ongoing accountability of anyone dispatched from the OSC. The Control Room Supervisor or the Security Shift Supervisor track individuals who are assigned to the Control Room or the Security Force respectively.
- Radiological exposure control for the individuals within the OSC
- Mobilizing individuals on the emergency roster needed to fill the positions in the OSC and other support personnel such as materials and warehouse personnel

The OSC is activated with a minimum staff within about 60 minutes after the declaration of an Alert, SAE, or GE.

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RADIATION EMERGENCY PLAN

EP-100
REVISION XX

SAFETY RELATED

Section 4: Emergency Facilities and Equipment

4.1 Unit-Specific Emergency Facilities

A. Control Room

The Control Room, located in the Control Building is designed to be habitable under accident conditions and shall serve as the onsite Emergency Control Center. Emergency lighting, power, air filtration, ventilation system and shielded walls enables the operators to remain in the Control Room to ensure that the reactor will remain in a safe condition. In addition, the operators shall be able to evaluate situational conditions and relay pertinent information and data to the appropriate onsite and offsite agencies and organizations during all emergencies. To ensure that shift personnel and other personnel assembled at the location can remain self-sufficient, emergency equipment and supplies shall be stored in, or near, the Control Room. The exact location and the type and quantity of emergency equipment and supplies available are specified in EPP-103, Emergency Equipment Checklist.

B. Technical Support Center (TSC)

The TSC, located in the basement of the Nuclear Operations Building is designed to be habitable under accident conditions and shall serve as the onsite Emergency Control Center after relieving the Control Room of command and control. Emergency lighting, power, air filtration, ventilation system, and below earthen grade walls enable the responders to remain in the TSC. In addition, the responders shall be able to evaluate situational conditions and relay pertinent information and data to the appropriate onsite and offsite agencies and organizations during all emergencies. This facility is located outside the Unit 1 Protected Area approximately 1900 ft from the Control Room and provides the ability to respond and activate the facility in a timely fashion.

C. Operational Support Center (OSC)

The OSC is located on the first floor in the Auxiliary Service Building within the Protected Area and is separate from the Control Room. The OSC is the location from which survey, operations, and repair teams are dispatched into areas of the plant. It is the staging area for individuals who may be assigned to first aid, search, survey, rescue, repair, and corrective action teams.

The OSC Supervisor is responsible for managing the activities in the OSC including:

- Ongoing accountability of anyone dispatched from the OSC. The Control Room Supervisor or the Security Shift Supervisor track individuals who are assigned to the Control Room or the Security Force respectively.
- Radiological exposure control for the individuals within the OSC
- Mobilizing individuals on the emergency roster needed to fill the positions in the OSC and other support personnel such as materials and warehouse personnel

The OSC is activated with a minimum staff within about 60 minutes after the declaration of an Alert, SAE, or GE.