Section 3: Classification of Emergencies

Section D in Part 2 of the Plan describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY. These classification levels are entered by meeting the criteria of EALs provided in EPP-001, Activation and Implementation of Emergency Plan.

The EALs and the Technical Bases for the EALs are based on NEI 99-01, "Methodology for the Development of Emergency Action Levels." The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

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 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 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 the Unit 1 Protected Area and provides the ability to respond and activate the facility in a timely fashion.~~

B. 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~~75 minutes after the declaration of an Alert, SAE, or GE.

Equipment and supplies for the OSC include protective clothing, dosimetry, and sampling and survey equipment to be used by the OSC teams.

Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

In the event the OSC becomes uninhabitable, Emergency Plan Implementing Procedures provide details on how to relocate OSC personnel.

C. Onsite Laboratories

Chemistry laboratories located on the 412' elevation in the Control Building are available for emergency response during an accident. The laboratories can receive power from the plant's emergency diesel generators. General capabilities include:

- Radionuclide identification in various sample media

- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment

D. First Aid Treatment Area

First aid treatment areas are located onsite for the treatment of those individuals requiring first aid. These areas are located at the Radiation Control Area Control Point at the 412' elevation of the Control Building and at the 436' elevation of the Service Building. Medical equipment and supplies are available at these locations.

E. Decontamination Area

The decontamination facility at VC Summer Unit 1 is located at the Radiation Control Area Control Point, elevation 412' of the Control Building.

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4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Redundant wind and temperature sensors are installed on a 61-meter self-supporting tower for Unit 1. Instrument elevators and 8-foot instrument booms are installed to raise and lower the sensors for easier maintenance. Measurements from these instruments provide indications to various points on the site, including recorders within the Control Room. A dew point sensor is installed near the base of the tower. A total precipitation sensor is installed on an individual pedestal near the tower. Data processing and recording equipment are located at the base of the tower. The tower is located about 1563 feet west of the Reactor Building at elevation 436 feet above MSL. The Reactor Building is at elevation 436 feet above MSL, and Monticello Reservoir is filled to elevation 425 feet above MSL. Elevations in the site vicinity range from below 230 feet on the Broad River to over 600 feet near Little Mountain. The tower-mounted sensors are as follows:

   a. At 61 meters above ground level, the upper wind speed and wind direction sensors, as well as the upper temperature sensors for the 10-61 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   b. At 40 meters above ground level, the upper temperature sensors for the 10-40 meter delta temperature measurement is mounted on the 8-foot instrument boom.

   c. At 10 meters above ground level, the lower wind speed and wind direction sensors, as well as the lower temperature sensors for the 10-61 and 10-40 meter differential temperature measurements and ambient temperature readings are mounted on the 8-foot boom. Data from the meteorological measurements system are provided to an onsite data capture computer (which is capable of various data manipulations). Meteorological data necessary for the estimation of offsite dose projections is available via terminals to personnel in the Control Room, TSC, and EOF. When the onsite meteorological tower is not available for the estimation of offsite dose projections, meteorological data from the NWS in Columbia, South Carolina, will be used.

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area RMS; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and are listed in Table 4-1, Radiation Monitoring System Description.

Table 4-1: Radiation Monitoring System Description

Instrument Channel	Location		Range
Alpha Gamma Monitor			
RM G1	Control Room		0.1 mr/hr -10 r/hr
RM G2	Radio Chemical Laboratory		0.1 mr/hr -10 r/hr
RM G3	Sampling Room		0.1 mr/hr -10 r/hr
RM G4	Hot Machine Shop		0.1 mr/hr -10 r/hr
RM-G5	Reactor Building Personnel Access		0.1 mr/hr -10 r/hr
RM G6	Reactor Building Refueling Bridge		0.1 mr/hr -10 r/hr
RM G7	Reactor Building		1 r/hr - 10^7 r/hr
RM G8	Fuel Handling Building Refueling Bridge		0.1 mr/hr -10 r/hr
RM G9	Auxiliary Building Demineralizer Area		0.1 mr/hr -10 r/hr
RM G10	Waste Gas Decay Tank Area		0.1 mr/hr -10 r/hr
RM G11	Auxiliary Building Drumming Area		0.1 mr/hr -10 r/hr
RM G12	Auxiliary Building Waste Holdup Tank Area		0.1 mr/hr -10 r/hr
RM G13	Auxiliary Building Charging Pump Area		0.1 mr/hr -10 r/hr
RM G14	Reactor Building In Core Instrumentation Area		0.1 mr/hr -10 r/hr
RM G15	Movable Monitor		0.1 mr/hr -10 r/hr
RM G16	Turbine Building		0.1 mr/hr -10 r/hr
RM G17A	Reactor Building Manipulator Crane		1 mr/hr -100 r/hr
RM G17B	Reactor Building Manipulator Crane		1 mr/hr -100 r/hr
RM G18	Reactor Building		1 r/hr -10^7 r/hr
RM G19A	Main Steam Line		0.1 mr/hr -10^7 mr/hr
RM G19B	Main Steam Line		0.1 mr/hr -10^7 mr/hr
RM G19C	Main Steam Line		0.1 mr/hr -10^7 mr/hr
Atmospheric Radiation Monitors			
RM-1A	Control Room Supply Air	Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2×10^{-6} to 2×10^{-2} µCi/cc
		Iodine	2×10^{-11} to 1×10^{-7} µCi/cc
RM-A2	Reactor Building Air Samples	Particulate	5.5×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine	2×10^{-11} to 2×10^{-7} µCi/cc
RM A3	Main Plant Vent	Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc

Table 4-1: Radiation Monitoring System Description (continued)

Instrument Channel	Location	Range
Atmospheric Radiation Monitors (continued)		
RM A4	Reactor Building Purge Exhaust Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A6	Fuel Handling Building Exhaust Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A7	Sampling Rm Monitor (Movable) Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A8	Spent Fuel Area Monitor (Movable) Particulate	4.7×10^{-11} to 1×10^{-7} µCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A9	Condenser Exhaust Monitor	4×10^{-6} to 4×10^{-2} µCi/cc
RM A10	Waste Gas Discharge	2×10^{-4} to 2×10^{0} µCi/cc
RM A11	Auxiliary Building Ventilation Monitor	2×10^{-6} to 2×10^{-2} µCi/cc
RM A12	Movable Atmospheric Monitor	4.7×10^{-11} to 1×10^{-7} µCi/cc
RM A13	Main Plant Vent	8.6×10^{-3} to 8.6×10^{5} µCi/cc
RM A14	Reactor Building Purge Exhaust	8.6×10^{-3} to 8.6×10^{5} µCi/cc
Liquid Radiation Monitors		
RM L1	Primary Coolant Letdown Monitor	1×10^{-3} to 1×10^{3} µCi/cc
RM L2A	Component Cooling Monitors	1×10^{-6} to 2×10^{-2} µCi/cc
RM L2B	Component Cooling Monitors	1×10^{-6} to 2×10^{-2} µCi/cc
RM L3	Steam Generator Blowdown	1×10^{-6} to 2×10^{-2} µCi/cc
RM L4	Spent Fuel Cooling Water Monitor	1×10^{-6} to 2×10^{-2} µCi/cc
RM L5	Liquid Waste Effluent	1×10^{-6} to 2×10^{-2} µCi/cc
RM L6	Boron Recycle	1×10^{-6} to 2×10^{-2} µCi/cc
RM L7	Nuclear Blowdown Waste Effluent	1×10^{-6} to 2×10^{-2} µCi/cc
RM L8	Turbine Building Sump	2×10^{-7} to 2×10^{-3} µCi/cc
RM L9	Liquid Waste Effluent	1×10^{-6} to 2×10^{-2} µCi/cc
RM L10	Steam Generator Blowdown Effluent RM	1×10^{-6} to 2×10^{-2} µCi/cc
RML11	Condensate Polisher Backwash Effluent	1×10^{-6} to 1×10^{-3} µCi/cc

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of a elevated radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 1 FSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

VCSNS has provided seismic instrumentation for onsite monitoring of the nuclear station. Triaxial time history accelerometers are operable onsite with recorders located in the relay room below the Control Room. An indication and/or an audible alarm in the Control Room is actuated (1) when the triaxial seismic switch at the Reactor Building foundation mat signals that the OBE acceleration has been exceeded in either of the horizontal directions or in the vertical direction, (2) when any of the 12 elements of each component of the triaxial response spectrum recorder at the Reactor Building foundation mat exceeds the frequency acceleration setpoint, or (3) when the seismic accelerometer at the Reactor Building foundation mat detects acceleration greater than 0.01g in either horizontal direction or greater than 0.0067g in the vertical direction. Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of ~~the~~ VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection Carbon Dioxide, Halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose projection software system is comprised of a series of software components that function in a multi-tasked Windows environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a ~~LAN/WAN~~network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via ~~LAN/WAN~~network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all run from a GUI interface.

The software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed, based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site and local maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleths (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

4.3 Communications

VCSNS Unit 1 has established additional communication systems that ensure reliable and timely exchange of information necessary to provide effective command and control over any emergency response (1) between the station and state and county agencies within the EPZs, (2) with federal EROs, (3) between the station, the EOF, and the state and county EOCs, and (4) between ERFs and Field Monitoring Teams. A general description of the systems is as follows:

1) Main & Fuel Handling Page System (Gaitronics): This system of networked phone stations and speakers strategically located throughout the station. Each phone station contains a telephone type receiver-transmitter handset, and channel selector switches. The system is equipped with an alarm encoder for alerting personnel through a series of designated tones. The Fuel Handling Page System is Line 5 on the Main Page System is only available in areas with fuel handling capabilities.

2) Redundant Paging System: This independent system of networked phone stations and speakers strategically located in areas of the station involved in the process of Engineered Safety Features shutdown. The system contains its own phone stations, power supplies, line balance equipment, and cable system. The system is distinguished by its red color.

3) Maintenance Jack System: The Maintenance Communication system consists of a network of strategically located jack stations. Each jack station has four separately wired receptacles mounted on it, providing four independent communications channels. Several headsets, each consisting of a padded earphone type receiver and a boom-mounted noise-canceling microphone are provided for hands-free operation of the system. Each headset is equipped with a belt clip amplifier and 30 feet of cable.

4.4 Plant Alarms

In conjunction with the Main Plant Page System, Unit 1 has audible (pulse, wale, warble, steady, etc.) alarms used to alert site personnel to and unsafe or emergency conditions. The alarms include a Reactor Building Evacuation Alarm, Radiation Emergency/Site Evacuation Alarm, and Fire Alarm. Activation of these alarms is done from the Control Room.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 1 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel are take immediate cover, assembly, or evacuation of an area or the site. Protective actions will be issued individually or in combination, based on the health and safety of site personnel. There are four distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, the Owner Controlled Area (OCA), and the Nuclear Exclusion Area. Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take Immediate Cover may be used in a security threat situation where there is little or no time to relocate personnel, or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for the Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 1 Assembly Area is located in the Nuclear Operations Building located southwest of Unit 1, outside the Protected and Owner Controlled Areas. There is ample space for non-essential personnel from all areas of the site. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area.

5.3 Unit Evacuation Routes

There are two exits from the Unit 1 OCA. Both of these exits will be used provided that there is evacuation prior to any release of radioactive material. This permits the nonessential personnel at the site an opportunity to depart the site using their personal vehicles. In the event that there is, or has been a radiological release, personnel will be directed as to which exit to use and the egress route to minimize personnel exposure and vehicle contamination.

There are also two distinct exits from the Nuclear Exclusion Area. The North access road and the South access road (off Fairfield Pump Storage road and through the construction site for Units 2 & 3) provide entry and exit from the Exclusion Area in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the Nuclear Exclusion Area is controlled at these locations during a declared emergency of Alert or higher classification.

Annex 2: Unit 2

Section 1: Introduction

This Plan Annex provides unit-specific details for Unit 2.

This includes a unit description (type of reactor, relationship to other units, special emergency equipment), shift staffing, EALs, and any emergency facility locations that differ from those described in the emergency plan for a full understanding and representation of the station's emergency response capabilities. This Unit 2 Annex is subject to the same review and audit requirements as the Radiation Emergency Plan.

1.1 Unit 2 Description

The VCSNS is owned jointly by SCE&G and Santee Cooper but is operated by SCE&G. An area map showing the geographical location of the facility is provided Figure 1-1 in Part 1 of the Plan.

The design of Unit 2 is that of a passive pressurized water-type nuclear steam supply system supplied and manufactured by Westinghouse. The system uses chemical shim and control rods for reactivity control and U-tubed steam generators. A diagram identifying VCSNS Unit 2 facilities is provided in Figure B1-1.

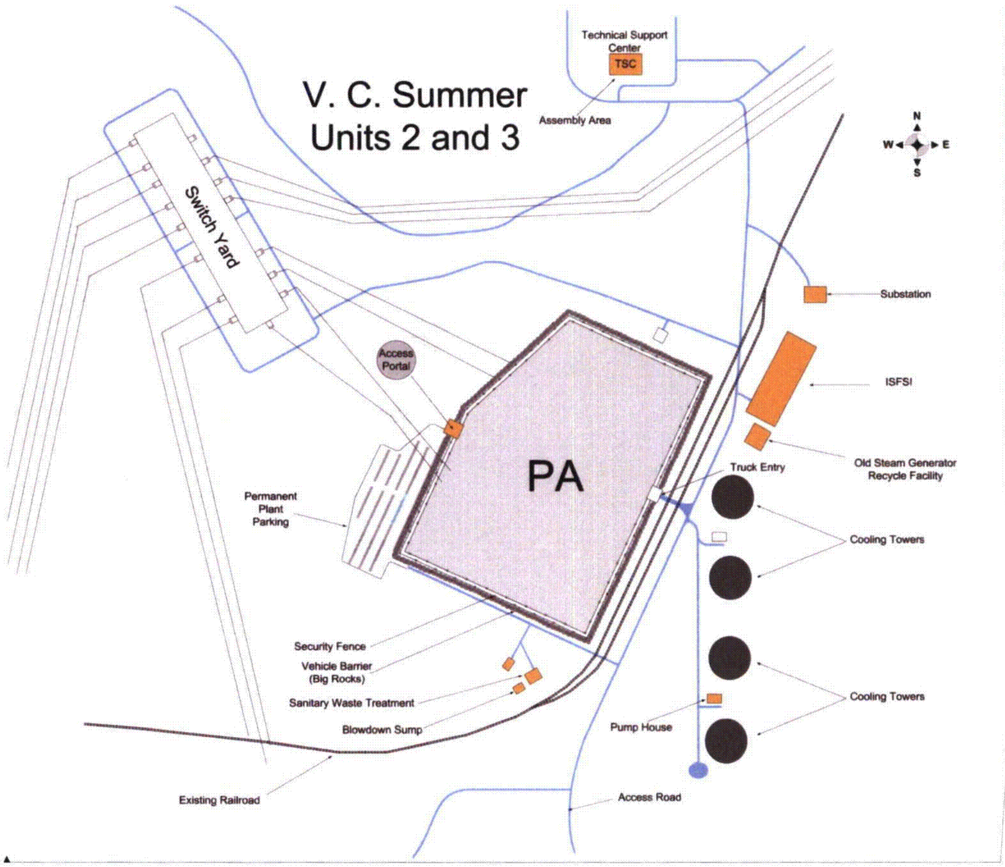

Figure B1-1 Units 2 and 3 Facility Layout (specimen)

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Section 2: Organizational Control of Emergencies

Section B of the Plan describes the Station's ERO. This section of the Unit 2 Annex describes the on-shift ERO staffing and their responsibilities to implement the Plan.

2.1 Normal Shift Staffing

The VCSNS operating organization includes the personnel encompassing both the management and operation of the unit. The maintenance and technical support personnel staffing the station organization are normally onsite daily Monday through Friday, holidays excluded. Personnel who are on duty on a 24-hour basis are listed in Table 2-1.

The Shift Supervisors, one of whom is on duty at all times, are responsible for the safe and efficient operation of the plant in accordance with the Technical Specifications and operating procedures during their assigned shift. The duty Shift Supervisor maintains control over plant operations as the senior licensed operator unless properly relieved by another member of the station staff who holds a valid SRO License. The Shift Supervisor maintains control over the conduct of operations and personnel in the Control Room.

STAs perform accident assessment and evaluate operating conditions. Organizationally, they report to the Manager, Operations. While on duty they diagnose off-normal events and report to the Shift Supervisor. The duties of the STA do not include the manipulation of controls or the supervision of operators. When on duty, he will be available to the Shift Supervisor in the Control Room within 10 minutes of being summoned. During emergency conditions, the STA will report to the Control Room and perform as an STA.

During off-hour shifts, the plant is staffed to support continuous operation. The normal operational staff includes (as a minimum) two licensed SROs (the Shift Supervisor and Control Room Supervisor), two licensed reactor operators, and two non-licensed operators. In addition, an STA is assigned to each shift. The initial emergency organization during off-hours shifts consists of the operating staff, with the Shift Supervisor serving as the IED. The IED may be relieved in the Control Room by another SRO qualified as an IED. Initial actions in regard to first aid, firefighting, rescue, damage control, radiation monitoring, emergency classification, notifications, and dose assessment are performed by the normal operational staff.

2.2 Shift Emergency Response Positional Responsibilities

The Unit 2 Annex, Table 2-1 outlines Shift ERO positions required to meet minimum staffing and the major tasks assigned to each position. In the event that Unit 2 declares an emergency and it is the affected unit, the Unit 2 Shift Supervisor will assume the duties of the IED. The Unit 2 on-shift personnel will be augmented by personnel from the other site unit(s). Personnel from the other site unit(s) may be dispatched to assist the Unit 2 On-Shift personnel when it is safe to do so. These additional personnel will provide the needed resources to enhance the response to the event until the On-Call ERO personnel respond, and are ready to activate the ERFs. Unit 1 is the lead unit for declaring and responding to an emergency that affects the entire site, such as a security or natural phenomena related event, or if there are multiple units in a declared emergency simultaneously. Should one of these events occur, the Shift Supervisor from Unit 2 would direct the operational response of the emergency/event when it is safe to do so. The Unit 2 Shift Supervisor would provide the needed information to the Unit 1 Shift Supervisor who declares the emergency and assumes the role of IED and all of the duties associated with that position.

Table 2-1: V. C. Summer On-Shift Staffing and ERO Positions

Functional Area	Major Tasks	Shift Position	Minimum Shift Compliment	ERO Position
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor Control Room Supervisor Reactor Operator Auxiliary Operator	1 1 2 2	Interim Emer. Dir. Control Room Supervisor Reactor Operator Auxiliary Operator
2. Emergency Direction and Control	Command and Control	Shift Supervisor	(a)	Interim Emergency Director
3. Notification & Communication	Emergency Communications	Shift Supervisor Communicator	(a) 1(e)	Interim Emergency Director State/County Communicator (e)
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Dose Assess./Health Physics	Health Physics Specialist	1	Health Physics Specialist
	In-plant Surveys	Health Physics Specialist	1	Health Physics Specialist
	Chemistry	Chemistry Specialist	1	Chemistry Specialist
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Technical Advisor	(b)	Shift Technical Advisor
	Repair and Corrective Actions	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic	1 1 1	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic
6. In-Plant Protective Actions	Radiation Protection	Health Physics Specialist	(b)	Health Physics Specialist
7. Fire Fighting	—	Fire Brigade	(c)(f)	Fire Brigade
8. First Aid and Rescue Operations	—	Medical Emergency Response Team	(b)(f)	Plant Personnel
9. Site Access Control and Personnel Accountability	Security and Accountability	Security Force	(d)	Security Force

(a) The Shift Supervisor shall function as the IED until relieved by the Emergency Director, Offsite Emergency Manager, and Emergency Control Officer
(b) May be provided by shift personnel assigned other functions
(c) Per station Fire Protection Plan
(d) Per VCSNS Security Plan
(e) Telephone Communicator only
(f) Support provided by offsite response organizations

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Section 3: Classification of Emergencies

Section D in Part 2 of the Plan describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY.

The EALs and the technical bases for the EALs are based on NEI 07-01, Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

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.

B. Operations Support Center

The OSC is located in the Control Support Area in the Annex Building on 417'-6" elevation and is separated from the Control Room. The OSC is the location from which survey, operations, and repair teams are dispatched into areas of the plant and 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 75 minutes after the declaration of an Alert, SAE, or GE.

Equipment and supplies for the OSC include protective clothing, dosimetry, and sampling and survey equipment to be used by the OSC teams.

Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

In the event the OSC becomes uninhabitable, Emergency Plan Implementing Procedures provide details on how to relocate OSC personnel.

C. Onsite Laboratories

The radiochemistry laboratory on the 382'-6" elevation in the Auxiliary Building is available for emergency response during an accident. The laboratories can receive power from the plant's diesel generators. General capabilities include:

- Radionuclide identification in various sample media.
- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment.

D. First Aid/Decontamination Area

The Health Physics area near the work exits contains the personnel contamination monitoring equipment, decontamination shower facilities, and first-aid equipment.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Wind and temperature sensors are installed on a 60-meter tower. An instrument elevator and 8-foot instrument booms are used to raise and lower the sensors for easier maintenance. These instruments provide indication to various points on the site including recorders within the Control Room. A total precipitation sensor and dew point sensor are located near the base of the Unit 1 meteorological tower. A processing computer is mounted at the base of the tower on a cabinet rack. This cabinet rack is located on a concrete pad that is approximately 10 feet wide and 5 feet deep. The meteorological tower for Units 2 and 3 is about 0.75 mile southwest of the center of the Unit 2 reactor building and 0.5 mile southwest of the center of the Unit 3 reactor building at an elevation of 435.5' above MSL. The tower-mounted sensors are as follows:

   a. At 60 meters above ground level, the upper wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-60 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   b. At 30 meters above ground level, the wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-30 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   c. At 10 meters above ground level the lower wind speed and wind direction sensors as well as the lower temperature sensor for the 10-60 and 10-30 meter differential temperature measurements and ambient temperature readings are mounted on the 8-foot instrument boom.

   Data from the meteorological measurements system are provided to an onsite processing computer (which is capable of various data manipulations). Meteorological data necessary for the estimation of offsite dose projections is available via terminals to personnel in the Control Room, TSC, and EOF. Should the computerized information or the computer-based assessment system not be available or if results are suspect, the Unit 1 meteorological tower data will be used. When both onsite meteorological towers are not available for the estimation of offsite dose projections, meteorological data from the National Weather Service (NWS) in Columbia, South Carolina, will be acquired and used.

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area RMS; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and are listed in Table 4-1, Radiation Monitoring Detectors.

Table 4-1 Radiation Monitoring Detectors

Detector	Location	Range
VBS-RE001A	MCR Supply Air Duct (Particulate)	1×10^{-12} to 1×10^{-7} µCi/cc
VBS-RE001B	MCR Supply Air Duct (Particulate)	1×10^{-12} to 1×10^{-7} µCi/cc
VBS-RE002A	MCR Supply Air Duct (Iodine)	1×10^{-11} to 1×10^{-5} µCi/cc
VBS-RE002B	MCR Supply Air Duct (Iodine)	1×10^{-11} to 1×10^{-5} µCi/cc
VBS-RE003A	MCR Supply Air Duct (Gas)	1×10^{-7} to 1×10^{-2} µCi/cc
VBS-RE003B	MCR Supply Air Duct (Gas)	1×10^{-7} to 1×10^{-2} µCi/cc
PSS-RE026	Containment Atmosphere Gas	1×10^{-7} to 1×10^{-2} µCi/cc
PSS-RE027	Containment Atmosphere N^{13}/F^{18}	1×10^{-7} to 1×10^{-2} µCi/cc
BDS-RE010	Steam Generator Blowdown Electrodeionization Effluent	1×10^{-6} to 1×10^{-1} µCi/cc
BDS-RE011	Steam Generator Blowdown Electrodeionization Brine	1×10^{-6} to 1×10^{-1} µCi/cc
CCS-RE001	Component Cooling Water System	1×10^{-7} to 1×10^{-2} µCi/cc
SGS-RE026	Main Steam Line	1×10^{-1} to 1×10^{3} µCi/cc
SGS-RE027	Main Steam Line	1×10^{-1} to 1×10^{3} µCi/cc
SWS-RE008	Service Water Blowdown	1×10^{-7} to 1×10^{-2} µCi/cc
PSS-050	Primary Sampling Liquid	1×10^{-4} to 1×10^{2} µCi/cc
PSS-052	Primary Sampling Gaseous	1×10^{-7} to 1×10^{-2} µCi/cc
VFS-RE001	Containment Air Filtration Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
WGS-RE017	Gaseous Radwaste Discharge	1×10^{-5} to 1×10^{1} µCi/cc
VFS-RE101	Plant Vent Particulate	1×10^{-12} to 1×10^{-7} µCi/cc
VFS-RE102	Plant Vent Iodine	1×10^{-11} to 1×10^{-6} µCi/cc
VFS-RE103	Plant Vent Gas (Normal Range)	1×10^{-7} to 1×10^{-2} µCi/cc
VFS-RE104A	Plant Vent Extended Range Gas(Accident Mid Range)	1×10^{-4} to 1×10^{2} µCi/cc
VFS-RE104B	Plant Vent Extended Range Gas(Accident High Range)	1×10^{-1} to 1×10^{5} µCi/cc
TDS-RE001	Turbine Island Vent Discharge	1×10^{-6} to 1×10^{5} µCi/cc
WLS-RE229	Liquid Radwaste Discharge	1×10^{-7} to 1×10^{-2} µCi/cc
WWS-RE021	Waste Water Discharge	1×10^{-7} to 1×10^{-2} µCi/cc
VAS-RE001	Fuel handling Area Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VAS-RE002	Auxiliary Building Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VAS-RE003	Annex Building Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VHS-RE001	Health Physics and Hot Machine Shop Exhaust	1×10^{-13} to 1×10^{-7} µCi/cc
VRS-RE023	Radwaste Building Exhaust	1×10^{-13} to 1×10^{-7} µCi/cc

Table 4-1 Radiation Monitoring Detectors (Continued)

Detector	Location	Range
Area Radiation Monitor Detection Parameters		
RMS-RE008	Primary Sampling Room	$1x10^{-1}$ to $1x10^{7}$ mR/hr
RMS-RE009	Containment Area – Personnel Hatch	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE010	Main Control Room	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE011	Chemistry Laboratory Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE012	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE013	Rail Car Bay Area/Auxiliary Bldg. Loading Bay	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE014	Liquid and Gaseous Radwaste Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE016	Control Support Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE017	Radwaste Bldg. Mobile Systems Facility	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE018	Hot Machine Shop	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE019	Annex Staging & Storage Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE020	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
PXS-RE160	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE161	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE162	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE163	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr

Note: Information acquired from Westinghouse AP1000 Design Control Document Tier 2 Chapter 11.5.

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of a raised radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 2 and 3 FSAR. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

Unit 2 has four triaxial acceleration sensor units and they are connected to a time-history analyzer. The time-history analyzer recording and playback system is located in a panel in the nuclear island in a room near the main control room. Seismic event data from these is recorded on a solid-state digital recording system at 200 samples per second per data channel.

This solid-state recording and analysis system has internal batteries and a charger to prevent the loss of data during a power outage, and to allow data collection and analysis in a seismic event during which the power fails. Normally, 120-volt alternating current power is supplied from the non-Class 1E dc and uninterruptible power supply system. The system uses triaxial acceleration sensor input signals to initiate the time-history analyzer recording and main control room alarms. The system initiation value is adjustable from 0.002g to 0.02g.

The time-history analyzer starts recording triaxial acceleration data from each of the triaxial acceleration sensors after the initiation value has been exceeded. Pre-event recording time is adjustable from 1.2 to 15.0 seconds, and will be set to record at least 3 seconds of pre-event signal. Post-event run time is adjustable from 10 to 90 seconds. A minimum of 25 minutes of continuous recording is provided. Each recording channel has an associated timing mark record with 2 marks per second, with an accuracy of about 0.02 percent.

The sensor installation anchors are rigid so that the vibratory transmissibility over the design spectra frequency range is essentially unity.

Triaxial Acceleration Sensors

Each sensor unit contains three accelerometers mounted in a mutually orthogonal array with one horizontal axis parallel to the major axis assumed in the seismic analysis. The triaxial acceleration sensors have a dynamic range of 1000 to 1 (0.001 to 1.0g) and a frequency range of 0.2 to 50 hertz.

One sensor unit will be located in the free field.

A second sensor unit is located on the nuclear island basemat in the spare battery charger room at elevation 366'-6" near column lines 9 and L.

A third sensor unit is located on the shield building structure at elevation 566' near column lines 4-1 and K.

The fourth sensor unit is located on the containment internal structure on the east wall of the east steam generator compartment just above the operating floor at elevation 438' close to column lines 6 and K.

Seismic instrumentation is not located on equipment, piping, or supports since experience has shown that data obtained at these locations is obscured by vibratory motion associated with normal plant operation.

Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of the VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose assessment software system is comprised of a series of software components that function in a multi-tasked Windows environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all runs from a GUI interface.

The dose assessment software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 2 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel range from take immediate cover, assembly, and evacuation of an area or the site. Protective actions will be issued by themselves or in combination, based on the health and safety of site personnel. There are three distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, and the Owner Controlled Area (OCA). Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take Immediate Cover may be used in a security threat situation where there is little or no time to relocate personnel or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for each Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area (Offsite Holding Area) for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 2 Assembly Area is located in the Nuclear Operations Building located north of the Unit 2 outside the Protected Area. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area

5.3 Unit Evacuation Routes

There are two distinct exits from the OCA. The North access road and the South access road provide entry and exit from the OCA in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the OCA is controlled at these locations during a declared emergency of Alert or higher classification.

Annex 3: Unit 3

Section 1: Introduction

This Plan Annex provides unit-specific details for Unit 3.

This includes a unit description (type of reactor, relationship to other units, special emergency equipment), shift staffing, EALs, and any emergency facility locations that differ from those described in the emergency plan for a full understanding and representation of the station's emergency response capabilities. This Unit 3 Annex is subject to the same review and audit requirements as the Radiation Emergency Plan.

1.1 Unit 3 Description

The VCSNS is owned jointly by SCE&G and Santee Cooper but is operated by SCE&G. An area map showing the geographical location of the facility is provided Figure 1-1 in Part 1 of the Plan.

The design of Unit 3 is that of a passive pressurized water-type nuclear steam supply system supplied and manufactured by Westinghouse. The system uses chemical shim and control rods for reactivity control and U-tubed steam generators. A diagram identifying VCSNS Unit 3 facilities is provided in Figure B1-1.

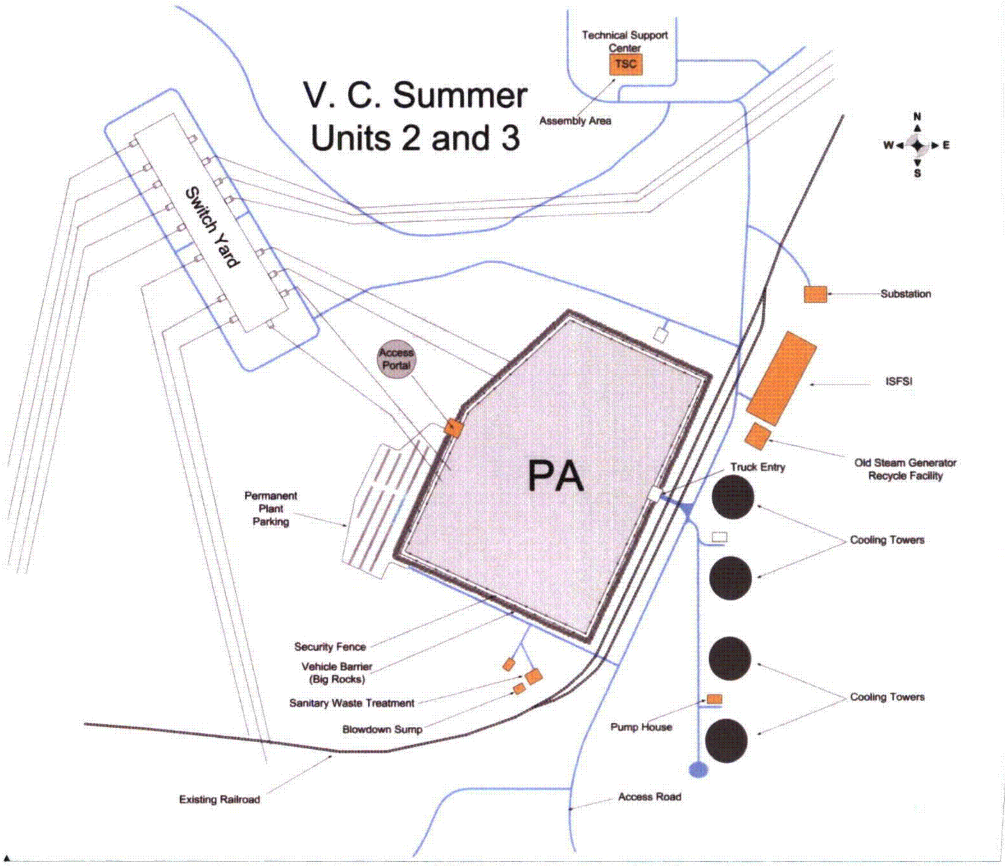

Figure C1-1 Units 2 and 3 Facility Layout (specimen)

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Section 2: Organizational Control of Emergencies

Section B of the VCSNS Radiation Emergency Plan describes the Station's ERO. This section of the Unit 3 Annex describes the on-shift ERO staffing and their responsibilities to implement the emergency plan.

2.1 Normal Shift Staffing

The VCSNS operating organization includes the personnel encompassing both the management and operation of the unit. The maintenance and technical support personnel staffing the station organization are normally onsite daily Monday through Friday, holidays excluded. Personnel who are on duty on a 24-hour basis are listed in Table 2-1.

The Shift Supervisors, one of whom is on duty at all times, are responsible for the safe and efficient operation of the plant in accordance with the Technical Specifications and operating procedures during their assigned shift. The duty Shift Supervisor maintains control over plant operations as the senior licensed operator unless properly relieved by another member of the station staff who holds a valid SRO License. The Shift Supervisor maintains control over the conduct of operations and personnel in the Control Room.

STAs perform accident assessment and evaluate operating conditions. Organizationally, they report to the Manager, Operations. While on duty they diagnose off-normal events and report to the Shift Supervisor. The duties of the STA do not include the manipulation of controls or the supervision of operators. When on duty, he will be available to the Shift Supervisor in the Control Room within 10 minutes of being summoned. During emergency conditions, the STA will report to the Control Room and perform as an STA.

During off-hour shifts, the plant is staffed to support continuous operation. The normal operational staff includes (as a minimum) two licensed SROs (the Shift Supervisor and Control Room Supervisor), two licensed reactor operators, and two non-licensed operators. In addition, an STA is assigned to each shift. The initial emergency organization during off-hours shifts consists of the operating staff, with the Shift Supervisor serving as the IED. The IED may be relieved in the Control Room by another SRO qualified as an IED. Initial actions in regard to first aid, firefighting, rescue, damage control, radiation monitoring, emergency classification, notifications, and dose assessment are performed by the normal operational staff.

2.2 Shift Emergency Response Positional Responsibilities

The Unit 3 Annex, Table 2-1 outlines Shift ERO positions required to meet minimum staffing and the major tasks assigned to each position. In the event that Unit 3 declares an emergency and it is the affected unit, the Unit 3 Shift Supervisor will assume the duties of the IED. The Unit 3 on-shift personnel will be augmented by personnel from the other site unit(s). Personnel from the other site unit(s) may be dispatched to assist the Unit 3 On-Shift personnel when it is safe to do so. These additional personnel will provide the needed resources to enhance the response to the event until the On-Call ERO personnel respond, and are ready to activate the ERFs. Unit 1 is the lead unit for declaring and responding to an emergency that affects the entire site, such as a security or natural phenomena related event, or if there are multiple units in a declared emergency simultaneously. Should one of these events occur, the Shift Supervisor from Unit 3 would direct the operational response of the emergency/event when it is safe to do so. The Unit 3 Shift Supervisor would provide the needed information to the Unit 1 Shift Supervisor who declares the emergency and assumes the role of IED and all of the duties associated with that position.

Table 2-1: V. C. Summer On-Shift Staffing and ERO Positions

Functional Area	Major Tasks	Shift Position	Minimum Shift Compliment	ERO Position
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor Control Room Supervisor Reactor Operator Auxiliary Operator	1 1 2 2	Interim Emer. Dir. Control Room Supervisor Reactor Operator Auxiliary Operator
2. Emergency Direction and Control	Command and Control	Shift Supervisor	(a)	Interim Emergency Director
3. Notification & Communication	Emergency Communications	Shift Supervisor Communicator	(a) 1(e)	Interim Emergency Director State/County Communicator (e)
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Dose Assess./Health Physics	Health Physics Specialist	1	Health Physics Specialist
	In-plant Surveys	Health Physics Specialist	1	Health Physics Specialist
	Chemistry	Chemistry Specialist	1	Chemistry Specialist
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Technical Advisor	(b)	Shift Technical Advisor
	Repair and Corrective Actions	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic	1 1 1	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic
6. In-Plant Protective Actions	Radiation Protection	Health Physics Specialist	(b)	Health Physics Specialist
7. Fire Fighting	—	Fire Brigade	(c)(f)	Fire Brigade
8. First Aid and Rescue Operations	—	Medical Emergency Response Team	(b)(f)	Plant Personnel
9. Site Access Control and Personnel Accountability	Security and Accountability	Security Force	(d)	Security Force

(a) The Shift Supervisor shall function as the IED until relieved by the Emergency Director, Offsite Emergency Manager, and Emergency Control Officer
(b) May be provided by shift personnel assigned other functions
(c) Per station Fire Protection Plan
(d) Per VCSNS Security Plan
(e) Telephone Communicator only
(f) Support provided by offsite response organizations

Section 3: Classification of Emergencies

Section D in Part 2 of the Plan describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY.

The EALs and the technical bases for the EALs are based on NEI 07-01, Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

Section 4: Emergency Facilities and Equipment

4.1 Unit-Specific Emergency Facilities

A. Operations Support Center

The OSC is located in the Control Support Area in the Annex Building on 417'-6" elevation and is separated from the Control Room. The OSC is the location from which survey, operations, and repair teams are dispatched into areas of the plant and 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 tracks individuals who are assigned to the Control Room Watch 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 may be activated when "minimum staffing positions" are filled and all positions will be staffed within 75 minutes after the declaration of an Alert, SAE, or GE.

  Equipment and supplies for the OSC include protective clothing, dosimetry, sampling, and survey equipment to be used by the OSC teams.

  Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

  Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

  In the event the OSC becomes uninhabitable, EPIPs provide details on how to relocate OSC personnel.

B. Onsite Laboratories

The radiochemistry laboratory on the 382'-6" elevation in the Auxiliary Building is available for emergency response during an accident. The laboratories can receive power from the plant's diesel generators. General capabilities include:

- Radionuclide identification in various sample media.
- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment.

C. Medical Treatment Area

The Health Physics area near the work exits contains the personnel contamination monitoring equipment, decontamination shower facilities, and first-aid equipment.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Wind and temperature sensors are installed on a 60-meter tower. An instrument elevator and 8-foot instrument booms are used to raise and lower the sensors for easier maintenance. These instruments provide indication to various points on the site including recorders within the Control Room. A total precipitation sensor and dew point sensor are located near the base of the Unit 1 meteorological tower. A processing computer is mounted at the base of the tower on a cabinet rack. This cabinet rack is located on a concrete pad that is approximately 10 feet wide and 5 feet deep. The meteorological tower for Units 2 and 3 is about 0.75 mile southwest of the center of the Unit 2 reactor building and 0.5 mile southwest of the center of the Unit 3 reactor building at an elevation of 435.5' above MSL. The tower-mounted sensors are as follows:

   a. At 60 meters above ground level, the upper wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-60 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   b. At 30 meters above ground level, the wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-30 meter differential temperature measurements are mounted on the 8-foot instrument boom.

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   Data from the meteorological measurements system are provided to an onsite processing computer (which is capable of various data manipulations). Meteorological data necessary for the estimation of offsite dose projections is available via terminals to personnel in the Control Room, TSC, and EOF. Should the computerized information or the computer-based assessment system not be available or if results are suspect, the Unit 1 meteorological tower data will be used. When both onsite meteorological towers are not available for the estimation of offsite dose projections, meteorological data from the NWS in Columbia, South Carolina, will be acquired and used.

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area RMS; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and are listed in Table 4-1, Radiation Monitoring Detectors.

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PSS-RE027	Containment Atmosphere N^{13}/F^{18}	1×10^{-7} to 1×10^{-2} µCi/cc
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CCS-RE001	Component Cooling Water System	1×10^{-7} to 1×10^{-2} µCi/cc
SGS-RE026	Main Steam Line	1×10^{-1} to 1×10^{3} µCi/cc
SGS-RE027	Main Steam Line	1×10^{-1} to 1×10^{3} µCi/cc
SWS-RE008	Service Water Blowdown	1×10^{-7} to 1×10^{-2} µCi/cc
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VFS-RE001	Containment Air Filtration Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
WGS-RE017	Gaseous Radwaste Discharge	1×10^{-5} to 1×10^{1} µCi/cc
VFS-RE101	Plant Vent Particulate	1×10^{-12} to 1×10^{-7} µCi/cc
VFS-RE102	Plant Vent Iodine	1×10^{-11} to 1×10^{-6} µCi/cc
VFS-RE103	Plant Vent Gas (Normal Range)	1×10^{-7} to 1×10^{-2} µCi/cc
VFS-RE104A	Plant Vent Extended Range Gas(Accident Mid Range)	1×10^{-4} to 1×10^{2} µCi/cc
VFS-RE104B	Plant Vent Extended Range Gas(Accident High Range)	1×10^{-1} to 1×10^{5} µCi/cc
TDS-RE001	Turbine Island Vent Discharge	1×10^{-6} to 1×10^{5} µCi/cc
WLS-RE229	Liquid Radwaste Discharge	1×10^{-7} to 1×10^{-2} µCi/cc
WWS-RE021	Waste Water Discharge	1×10^{-7} to 1×10^{-2} µCi/cc
VAS-RE001	Fuel handling Area Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VAS-RE002	Auxiliary Building Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VAS-RE003	Annex Building Exhaust	1×10^{-6} to 1×10^{-1} µCi/cc
VHS-RE001	Health Physics and Hot Machine Shop Exhaust	1×10^{-13} to 1×10^{-7} µCi/cc
VRS-RE023	Radwaste Building Exhaust	1×10^{-13} to 1×10^{-7} µCi/cc

Table 4-1 Radiation Monitoring Detectors (Continued)

Detector	Location	Range
Area Radiation Monitor Detection Parameters		
RMS-RE008	Primary Sampling Room	$1x10^{-1}$ to $1x10^{7}$ mR/hr
RMS-RE009	Containment Area – Personnel Hatch	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE010	Main Control Room	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE011	Chemistry Laboratory Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE012	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE013	Rail Car Bay Area/Auxiliary Bldg. Loading Bay	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE014	Liquid and Gaseous Radwaste Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE016	Control Support Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE017	Radwaste Bldg. Mobile Systems Facility	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE018	Hot Machine Shop	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE019	Annex Staging & Storage Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE020	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
PXS-RE160	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE161	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE162	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE163	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr

Note: Information acquired from Westinghouse AP1000 Design Control Document Tier 2 Chapter 11.5.

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of a raised radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 2 and 3 FSAR. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

Unit 3 has four triaxial acceleration sensor units and they are connected to a time-history analyzer. The time-history analyzer recording and playback system is located in a panel in the nuclear island in a room near the main control room. Seismic event data from these is recorded on a solid-state digital recording system at 200 samples per second per data channel.

This solid-state recording and analysis system has internal batteries and a charger to prevent the loss of data during a power outage, and to allow data collection and analysis in a seismic event during which the power fails. Normally, 120-volt alternating current power is supplied from the non-Class 1E dc and uninterruptible power supply system. The system uses triaxial acceleration sensor input signals to initiate the time-history analyzer recording and main control room alarms. The system initiation value is adjustable from 0.002g to 0.02g.

The time-history analyzer starts recording triaxial acceleration data from each of the triaxial acceleration sensors after the initiation value has been exceeded. Pre-event recording time is adjustable from 1.2 to 15.0 seconds, and will be set to record at least 3 seconds of pre-event signal. Post-event run time is adjustable from 10 to 90 seconds. A minimum of 25 minutes of continuous recording is provided. Each recording channel has an associated timing mark record with 2 marks per second, with an accuracy of about 0.02 percent.

The sensor installation anchors are rigid so that the vibratory transmissibility over the design spectra frequency range is essentially unity.

Triaxial Acceleration Sensors

Each sensor unit contains three accelerometers mounted in a mutually orthogonal array with one horizontal axis parallel to the major axis assumed in the seismic analysis. The triaxial acceleration sensors have a dynamic range of 1000 to 1 (0.001 to 1.0g) and a frequency range of 0.2 to 50 hertz.

One sensor unit will be located in the free field.

A second sensor unit is located on the nuclear island basemat in the spare battery charger room at elevation 366'-6" near column lines 9 and L.

A third sensor unit is located on the shield building structure at elevation 566' near column lines 4-1 and K.

The fourth sensor unit is located on the containment internal structure on the east wall of the east steam generator compartment just above the operating floor at elevation 438' close to column lines 6 and K.

Seismic instrumentation is not located on equipment, piping, or supports since experience has shown that data obtained at these locations is obscured by vibratory motion associated with normal plant operation.

Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of the VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable NFPA standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose assessment software system is comprised of a series of software components that function in a multi-tasked Windows 2000 or NT environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all runs from a GUI interface.

The dose assessment software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 3 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel range from take immediate cover, assembly, and evacuation of an area or the site. Protective actions will be issued by themselves or in combination, based on the health and safety of site personnel. There are three distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, and the Owner Controlled Area (OCA). Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take immediate cover may be used in a security threat situation where there is little or no time to relocate personnel or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for each Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 3 Assembly Area is located in the Nuclear Operations Building located north of the Unit 3 outside the Protected Area. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area.

5.3 Unit Evacuation Routes

There are two distinct exits from the OCA. The North access road and the South access road provide entry and exit from the OCA in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the OCA is controlled at these locations during a declared emergency of Alert or higher classification.

Appendix 1 - References

American Nuclear Insurers (ANI) Bulletin #5B	Accident Notification Procedures for Liability Insured, 1981
EPA-400-R-92-001	Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
FEMA-REP-10, Section E.6.2.1	Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants, November 1985
NEI 99-01, Revision 5	Methodology for Development of Emergency Action Levels
NEI 07-01, Revision 0	Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors
NRC Bulletin 2005-02	Emergency Preparedness and Response Actions for Security-Based Events, July 18, 2005
NRC Bulletin 80-15	Possible Loss of Emergency Notification System (ENS) with Loss of Offsite Power, June 18, 1980
NRC Generic Letter 91-14	Emergency Telecommunications, September 23, 1991
NRC Information Notice 85-44	Emergency Communication System Monthly Test, May 30, 1985
NRC Regulatory Guide 1.101	Emergency Planning and Preparedness for Nuclear Power Reactors, Revision 3, August 1992
NRC RTM-96	Response Technical Manual, March 1996
NUREG-0696	Functional Criteria for Emergency Response Facilities
NUREG/BR-0230, RCM-96	Response Coordination Manual, 1996
NUREG-0654/FEMA-REP-1 Rev. 1	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
NUREG-0728	Incident Response Plan, June 1987
NUREG-0737	Clarification of TMI Action Plan Requirements
Regulatory Issue Summary 2004-13	Consideration of Sheltering in Licensee's Range of Protective Action Recommendations, August 2, 2004
VCSNS Unit 1 Final Safety Analysis Report	

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VCSNS Unit 2 and 3 Final Safety Analysis Report

VCSNS Security Plan

VCSNS Offsite Dose Calculation Manual

Appendix 2 - Letters of Agreement

VCSNS maintains Letters of Agreement and/or Memorandums of Understanding with the following:

The state of South Carolina, Emergency Management Division (This letter includes the South Carolina Department of Health and Environmental Control.)

The County of Newberry

The County of Lexington

The County of Richland

The County of Fairfield

Fairfield County Emergency Medical Services

Lexington County Emergency Medical Services

The Department of Energy, Savannah River Office

Palmetto Health Richland Hospital

Radiation Emergency Assistance Center/Training Site, DOE, Oak Ridge, TN

Pinner Clinic

The Institute of Nuclear Power Operations

Jenkinsville — Monticello — Horeb Volunteer Fire Department

Greenbrier — Bethel Volunteer Fire Department

Blair Volunteer Fire Department

Feasterville Volunteer Fire Department

Lebanon Volunteer Fire Department

Community Volunteer Fire Department

Columbia Metropolitan Airport Fire and Rescue

South Carolina Fire Marshal's Office/South Carolina Fire Academy

NC Department of Crime Control and Public Safety – Div of Emergency Management

Letters of Agreement and/or Memorandums of Understanding are reviewed annually, updated as required, and certified. Current copies are retained in the Contract License and Permit Tracking System (CLP).

Appendix 3 – List of Emergency Plan Procedures

Implementing Procedures	Plan Section Implemented
Activation and Implementation of Emergency Plan (EPP-001)	Part II Sections B & D
Unusual Event (EPP-001.1)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
Alert (EPP-001.2)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
Site Area Emergency (EPP-001.3)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
General Emergency (EPP-001.4)	Part II Sections H, D.1, E.2 G.3 & J; Annex 1 Section 3
Communication and Notification (EPP-002)	Part II Sections E & F
Plant Radiological Surveying (EPP-003)	Part II Section H.6, 7, & 8
Offsite Dose Calculation (EPP-005)	Part II Section I; Annex 1 F
Core Damage Assessment Methodology (CP-308)	Part II Section I.3
Technical Support Center (EPP-023)	Part II Sections A, B, C, & H
Operational Support Center (EPP-028)	Part II Sections A, B, K, H, & M; Annex 1 Section 4.B
Emergency Operations Facility (EPP-051)	Part II Sections A, B, C, H, & K
Emergency Information Plan (EPP-052)	Part II Sections A, B, & H
Onsite Personnel Accountability and Evacuation (EPP-012)	Part II Sections D, J: Annex 1 Sections 4.B & 5.1
Environmental Monitoring (EPP-007)	Part II Sections C.2, H, & I
Onsite Medical (EPP-009)	Part II Section L
Post Recovery and Reentry (EPP-017)	Part II Section M
Personnel/Vehicle Decontamination (EPP-010)	Part II Sections H.5 & K.1; Annex 1
Personnel Search and Rescue (EPP-011)	Part II Section J.5
Fire Emergency (EPP-013)	Part I Section H; Part II Section I; Annex 1 Section D
Toxic Release (EPP-014)	Part I Section H
Natural Emergency (EPP-015)	Part I Section H
Emergency Personnel Exposure Control (EPP-020)	Part II Section K
Activation of the Early Warning Siren System (EPP-021)	Part II Section E.6
Hostile Action (EPP-027)	Part I Section H; Part II Section D; Appendix 4

Administrative Procedures	Plan Section Reference
Emergency Preparedness (SAP-0127)	Part II Section P
Emergency Equipment Checklists (EPP-103)	Part II Section H; Annex 1
Verification of Communications Operability (EPP-104)	Part II Section F
Conduct of Drills and Exercises (EPP-105)	Part II Section N
Emergency Preparedness Performance Indicator Procedure (EPP-106)	Part I
Conduct of Fire Brigade Drills (EPP-107)	Part II Section N.2
Emergency Action Level Technical Basis Document (EPP-108)	Part II Section D; Annex 1
Equipment Related to Emergency Preparedness (EPP-109)	Annex 1
Emergency Action Level Reference Manual (EPP-110)	Part II Section D; Annex 1
Emergency Preparedness Oversight Committee (EPP-111)	Part I
Maintenance of the Early Warning Siren System (EWSS) (EPMP-100)	Part II Section E.6
General Employee Training Emergency Plan Training and Drills (TQP-0605)	Part II Section O
Emergency Planning Telephone Directory	Part II Section P.10
Offsite Dose Calculation Manual (ODCM)	Part II H & I; Annex 1
Evacuation Time Estimate (ETE)	Part II Section J.8; Appendix 5
On-shift Staffing Analysis	Part 2 Section B and Table B-1a; Annex 1 Table 2-1 and Section 2.2

Appendix 4 - Abbreviations, Acronyms and Definitions

Accident (Incident or Event)	An unintentional or unexpected event resulting in radiological exposure, physical injury, or physical damage to property.
ALARA	(As Low As Reasonably Achievable) A radiation protection philosophy requiring that personnel exposure to radiation and radioactive material be kept not only within regulatory limits but be maintained As Low As Reasonably Achievable in the light of current technology with appropriate consideration for economic and social factors and for the benefits to be expected. ALARA applies not only to minimizing occupational exposure to radiation workers, but also to limiting the radioactivity of plant effluent and minimizing the potential for exposure to the public.
Annual (Annually)	At least once per 365 days $\pm$ 90 days, unless specifically identified as "based on a calendar year".
ANI	American Nuclear Insurers
ANS	Alert and Notification System
CDE	(Committed Dose Equivalent) Total Dose from internally deposited radionuclide over subsequent 50 year period to a specific organ.
CEDE	(Committed Effective Dose Equivalent) Sum of risk-weighted Committed Dose Equivalents to organs.
Certified	Official approval by written letter from the EP Manager verifying the item(s) to be accurate and up to date
CET	Core Exit Thermocouple
CFR	(Code of Federal Regulations) The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the federal government. The Code is divided into 50 titles that represent broad areas subject to federal regulation. Each title is divided into chapters that usually bear the name of the issuing agency. Each chapter further subdivided into parts covering specific regulatory areas.
Cold Shutdown	A reactor condition in which the coolant temperature has been reduced to 200°F or below and the pressure has essentially been reduced to atmospheric pressure. This is also known as Mode 5.
CA	(Contaminated Area) An area where radioactive material is deposited where it is not desired.
CR	Control Room
DAC	(Derived Air Concentration) The concentration of a given radionuclide in air.
DDE	(Deep Dose Equivalent) Dose equivalent from external radiation at a tissue depth of 1 centimeter.
DEP	Drill/Exercise Performance
DHEC (SCDHEC)	Department of Health and Environmental Control (SC)

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DHS	Department of Homeland Security (US)
DOE	Department of Energy (US)
Dose (Radiation)	The quantity of radiation absorbed per unit of mass by the body or by any portion of the body. The unit of radiation dose is the RAD.
Dose Equivalent	Quantity that expresses all radiations on a common scale for calculating the absorbed dose. It is defined as the product of the absorbed dose in rads and certain modifying factors. The unit is rem.
Dose Rate	Dose delivered per unit time.
Dosimeter	An instrument used for measuring the absorbed dose, exposure, or similar radiation quantity.
Dosimetry	A system of dosimeters for evaluating the absorbed dose, exposure, or similar radiation quantity.
DNR (SCDNR)	Department of Natural Resources (SC)
EAB	Exclusion Area Boundary (Nuclear Exclusion Area)
EALs	Emergency Action Levels
EAS	(Emergency Alert System) A network of broadcast stations and interconnecting facilities authorized by the Federal Communications Commission to operate in a controlled manner during a war, state of public peril, disaster or other national, state and local emergencies.
ECO	Emergency Control Officer
ED	Emergency Director
EMD (SCEMD)	Emergency Management Division (SC)
ENF	(Emergency Notification Form) A template form provided by the State of SC for the purpose of disseminating information to offsite agencies regarding an emergency.
ENS	Emergency Notification System
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPIO	Emergency Public Information Organization
EPIP	(Emergency Plan Implementing Procedure) Detailed procedures which provide guidance to individuals and groups for implementation of the provisions of the emergency plan.
EPRI	Electric Power Research Institute
EPZ	(Emergency Planning Zone) A generic area defined about a nuclear facility to facilitate offsite emergency planning and develop a significant response base. It is defined for the plume and ingestion exposure pathways.
ERDS	Emergency Response Data System
ERF	Emergency Response Facilities
ERO	Emergency Response Organization
ESSX	Electric Switch System Exchange
ETE	Evacuation Time Estimate
Evacuation	The removal of people from an area on an emergency basis to avoid or reduce possible short term radiation exposure.

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Exposure	Being exposed to ionizing radiation, radioactive materials, or other hazardous substances.
External Dose	Dose from a source of radioactive material outside the body.
FBI	Federal Bureau of Investigation
FCEMS	Fairfield County Emergency Medical Services
FEMA	Federal Emergency Management Agency
HEPA	High-efficiency particulate air filter
Frisker	Radiation monitoring equipment. This is a hand-held probe that is slowly passed near the area of interest to determine the presence or absence of radioactive material.
FRMAP	Federal Radiation Monitoring and Assessment Plan
FSAR	Final Safety Analysis Report
Gamma Rays	High-energy, short-wavelength electromagnetic radiation. Gamma rays are essentially similar to x-rays, but are usually more energetic and are nuclear in origin.
HP	(Health Physics) A general term used as a modifying phrase that may refer to facilities, equipment, programs, etc. used in the discipline of Health Physics. A profession devoted to the protection of man and his environment from unwarranted radiation exposure.
HRA	(High Radiation Area) Any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a dose equivalent could be received in any one hour in excess of 100 millirem, but less than 1000 millirem at 30 centimeters.
HOSTILE ACTION	An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, takes hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the Owner Controlled Area.)
Hostile Force	One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.
HPN	Health Physics Network
HSOC	Homeland Security Operations Center
I&C	Instrument and Controls
IED	Interim Emergency Director
Ingestion Exposure Pathway	The means of ingesting radioactive fallout from the plume through the consumption of food or water with a 10 – 50 mile radius of the site.

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INPO	(Institute of Nuclear Power Operations) An organization established by the utilities to set up standardized operations. By Letter of Agreement, INPO agrees to provide the service provided by their organization, coordinate the activities of the organization and provide telephone contacts of the organization during an emergency at the Station.
Internal Dose	Dose from a source of radioactive material within the body (as a result of deposition of radionuclides in body tissue).
Ionization Chamber	An instrument that detects and measures ionizing radiation by measuring the electrical current that flows when radiation ionizes gas in a chamber, making the gas a conductor of the electricity.
JIC	(Joint Information Center) A center set up in a central location where public information officers from the involved agencies come together to ensure coordination of information to be released to the media and the public. This center becomes the central point for media access to latest developments and emergency information. All information released is coordinated among the agencies involved to ensure its consistency and accuracy. This may also be referred to as the News Media Area.
KI	Potassium Iodide
LCEMS	Lexington County Emergency Medical Services
Liquid Effluent Stream	Processed liquid wastes containing radioactive materials resulting from the operation of a nuclear power reactor.
LOCA	(Loss of Coolant Accident) A loss of coolant accident can result from an opening in the primary cooling system, such as a pipe break or a stuck open relief valve.
Low Population Zone	The area which surrounds the exclusion zone and includes populations from the site out to three miles from the Unit 1 Reactor Building.
~~MAELU~~	~~Mutual Atomic Energy Liability Underwriters~~
MSL	Mean Sea Level
MERT	Medical Emergency Response Team
Monitor, Radiation	A radiation detector whose purpose is to measure the level of ionizing radiation (or quantity of radioactive material).
Monitoring	The continuous or periodic collection and assessment of pertinent information.
Monthly	At least once per 31 days ± 7 days
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC (USNRC)	Nuclear Regulatory Commission (US)
NRF	National Response Framework
NSSS	Nuclear Steam Supply System

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NUREG-0654/FEMA REP1, Rev 1	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants: The purpose of this guidance and upgraded acceptance criteria is to provide a basis for NRC licensees, and State and local governments to develop radiological emergency plans and improve emergency preparedness.
NWS	National Weather Service
Occupational Dose	A dose received by a permanent or temporary employee while engaged in activities relating to the use, possession, or surveillance of licensed radioactive material or sources of ionizing radiation. Occupational dose shall not include any exposure of an individual to radiation for the purpose of medical diagnosis or therapy. Determination of occupational dose is the responsibility of the licensee.
OCA	(Owner Controlled Area) The area bounded by the Protected Area on the inside and by the Primary Vehicle Barrier System (VBS) on the outside.
OEM	Offsite Emergency Manager
ORMC	Offsite Radiological Monitoring Coordinator
OSC	Operational Support Center
PA	(Protected Area) the area immediately surrounding the nuclear station encompassed by physical barriers (double fence) and access to which is controlled for nuclear security purposes.
PAD	Protective Action Directives
PAG	(Protective Action Guidelines) Projected total effective dose equivalent or committed dose equivalent values to individuals in the general population that warrant protective action following a release of radioactive materials. Protective actions would be warranted provided the reduction in individual dose expected to be achieved by carrying out the protective action is not offset by excessive risks to individual safety in taking the protective actions.
PAR	Protective Action Recommendations
PBX	Private Branch Exchange
Personnel Monitoring Equipment	Devices designed to be worn or carried by an individual for the purpose of measuring occupational radiation doses, e.g. thermo luminescent dosimeters, pocket dosimeters, and finger badges.
PI&R	Problem Identification & Resolution
Plume Exposure Pathway	The principal exposure sources from this pathway are: External exposure to gamma radiation from the plume and from deposited materials Inhalation exposure from the passing radioactive plume.
Pocket Dosimeter	An ionization chamber carried or worn by an individual for personnel dose monitoring.

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Portal Monitor	A walk-through radiation detector whose purpose is to detect beta and gamma emitting contamination on personnel exiting selected areas.
Posted Area	An area in which radiation and/or contamination exists or might exist at levels such that the use of warning signs or devices is required.
PPE	Personal Protective Equipment
Projected Dose	An estimate of the radiation dose that affected individuals could potentially receive if protective actions are not taken.
PF	(Protection Factor) A measure of the protection afforded by a respirator; the ratio of the concentration of the radionuclide in the ambient atmosphere to the concentration inside the respiratory equipment (usually inside the facepiece) under conditions of use.
Protective Action	Those emergency measures taken before or after an uncontrolled release of radioactive material has occurred for the purpose of minimizing radiological exposure to individuals. Also, measures that can be taken for the physical protection of plant personnel from a security or other hazards event.
Protective Clothing	Used interchangeably with the term anti-contamination clothing and has the same general meaning in radiation protection procedures.
QAPD	Quality Assurance Program Description
Quarterly	At least once per 92 days $\pm$ 23 days
Rad	A measure of the dose produced by directly or indirectly ionizing radiation in terms of the energy absorbed per unit mass of any irradiated material. One rad is the dose corresponding to 100 ergs of absorbed energy per gram of irradiated material.
Radiation, Ionizing	Any or all of the following: alpha, beta, gamma, X-rays, neutrons, high speed protons or electrons, and other atomic particles (sound, radio waves, visible, and infrared or ultraviolet light are non-ionizing forms of radiation).
RA	(Radiation Area) Any area, accessible to personnel, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 millirem, but less than 100 millirem in 1 Hour at 30 centimeters.
Radiation Exposure	Refers very broadly to the act or state of being exposed to ionizing radiation.
Radiation Protection	Used interchangeably with the term health physics.
RWP	(Radiation Work Permit) A document providing radiological evaluation and authorization to perform specific activities involving personnel exposure to ionizing radiation or radioactive material. It describes the radiological conditions and specifies radiation protection controls to be used when performing the activities.
Radioactive Contamination	The presence of radioactive material in an undesired location. Contamination may be loose, fixed, or present in air.

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Radionuclide	A radioactive nuclide is one that has the capability of spontaneously emitting radiation.
RCS	(Reactor Coolant System or Primary Coolant) The fluid circulated through the reactor to remove heat.
REAC/TS	Radiation Emergency Assistance Center/Training Site
Reactor Trip (SCRAM)	An automatic procedure by which control rods are rapidly inserted into the core of a reactor to stop the chain reaction.
Recovery	The process of reducing radiation exposure rates and concentrations in the environment to acceptable levels for unconditional occupancy.
Relocation	The removal or continued exclusion of people from contaminated areas to avoid chronic radiation exposure.
Rem	Special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rads multiplied by the quality factor.
RMS	Radiation Monitoring System
RVLIS	Reactor Vessel Level Indication System
SAMGs	Severe Accident Management Guidelines
SCBA	Self contained breathing apparatus
SCE&G	South Carolina Electric & Gas
SCSN	South Carolina Seismic Network
Secondary Coolant	A separate stream of coolant that is converted to steam by the primary coolant in a heat exchanger (steam generator) to power the turbine.
SRPD	(Self-Reading Pocket Dosimeter) A self-reading dosimeter is a direct-reading pocket dosimeter shaped like a pen with a pocket clip. It is generally used to measure X and gamma radiation.
Semi-annually	At least once per 184 days $\pm$ 46 days
Severe Accident: PWR	A nuclear accident involving a loss of core cooling and damage so severe that there are core geometry changes and possible relocation of core materials, e.g. a core melt. In accordance with the Severe Accident Management Guidelines, a severe accident has occurred when core exit thermocouple temperatures are greater than 1200 degrees F and actions to cool the core have been, and continue to be, unsuccessful. The plant is outside of the Design Bases for the station.
SHELTER	The use of the closest available structure that will provide protection from exposure to an airborne plume.
SLED	South Carolina Law Enforcement Division
SOT	Station Orientation Training
SPDS	Safety Parameter Display Systems
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
START	Simple Triage and Rapid Treatment
TEDE	(Total Effective Dose Equivalent) Sum of the deep dose equivalent and the committed effective dose equivalent.

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TLD	(Thermo Luminescent Dosimeter) A dosimeter based on the effect of ionizing radiation on certain thermo luminescent crystals, in which radiation excites orbital electrons of some atoms to a higher energy state orbit than normal. Stimulating the crystal by controlled heating allows the electrons to return to normal orbit, thereby emitting discrete quanta of light proportional to the amount of ionizing radiation absorbed by the crystal. Emitted light can be measured and related to personnel dose from ionizing radiation.
TSC	Technical Support Center
USCG	U.S. Coast Guard
VBS	(Vehicle Barrier System) security barrier delineated by the large rocks and vehicle search areas
VCSNS (VCS)	V.C. Summer Nuclear Station
Weekly	At least once per 7 days ± 2 days
X-Ray	Highly penetrating radiation similar to gamma rays.

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Appendix 5 - Evacuation Time Estimate Study

The Evacuation Time Estimate Study was prepared by KLD Associates, Inc. This controlled document, in its entirety, is filed under separate cover and has been distributed to designated locations.

Appendix 6 - Regulatory Requirements Cross Reference Document

Table No.	Regulatory Requirement
1	10 CFR 50 App. E
2	10 CFR 50.47
3	NUREG-0654

Table 1 – 10 CFR 50 Appendix E – Emergency Planning and Preparedness for Production and Utilization Facilities

REGULATION	STATEMENT	EPLAN	COMMENTS
IV A.	The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization	B.1, B.5	
IV A.	and the means for notification of such individuals in the event of an emergency.	E.2	
IV A.1	A description of the normal plant operating organization.	B.1	
IV A.2.a	A description of the onsite emergency response organization with a detailed discussion of: Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;	B.2, B.3, B.5	
IV A.2.b	Plant staff emergency assignments;	B.5	
IV A.2.c	Authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.	B.2, B.4	
IV A.3	A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.	B.5.c, B.7	
IV A.4	Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.	B.5.b.2, 3, 4, 5,& 6	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV A.5	Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.	A.3	
IV A.6	A description of the local offsite services to be provided in support of the licensee's emergency organization.	L.1, 2, 3, 4	
IV A.7	Identification of, and assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.	C.1, 2, 3, 4	
IV A.8	Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.	J.9	
IV A.9	A detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the time performance of their assigned functions as specified in the emergency plan.	Appendix 7	
IV B	The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described,	I.2, I.3, I.4, I.5, I.6, I.7, I.8, I.9, I.10	
IV B (continued)	including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies,	Annex 1, 2, & 3, E.2, E.3, E.4	
IV B (continued)	and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety.	Annex 1, 2, & 3, J.7, J.9, J.10	
IV B (continued)	The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring and shall include hostile actions.	Annex 1, 2, & 3, 3.2, N.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV B (continued)	These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by NRC.	D.2	
IV B (continued)	They shall also be discussed and agreed upon by the State and local governmental authorities and the NRC. They must be reviewed on an annual basis with State and local governments.	D.3	
IV C.1	The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described.	D.1	
IV C.1 (continued)	The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described.	E.2	
IV C.1 (continued)	Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described.	Annex 1, 2, & 3	
IV C.1 (continued)	The existence, but not the details, of a message authentication scheme shall be noted for such agencies.	E.1	
IV C.1 (continued)	The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG - 0654; FEMA - REP - 1.	D.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV C.2	Shall establish and maintain the capacity to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.	Part 1 Section 3, Annex 1, 2, & 3 Section 3	
IV D.1	Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.	E.3, E.4	
IV D.2	Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.	G.1, G.2	
IV D.3	A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency.	E.2.b.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV D.3 (continued)	The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this notification capability will range from immediate notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental officials to make a judgment whether or not to activate the public notification system.	E.6	
IV D.3 (continued)	The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15-minute design objective for the primary prompt public alert and notification system.	E.6	
IV D.3 (continued)	When there is a decision to activate the notification system, the State and local officials will determine whether to activate the entire notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public notification system shall remain with the appropriate governmental authorities.	E.6	
IV D.4 (continued)	FEMA approved nuclear power reactor site's alert and notification design report, including the backup alert and notification	~~Appendix 8~~	
IV E.1	Adequate provisions shall be made and described for emergency facilities and equipment, including: Equipment at the site for personnel monitoring;	H.1, H.2, H.5	
IV E.2	Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment;	H.5.b, H.5.d	
IV E.3	Facilities and supplies at the site for decontamination of onsite individuals;	H.5.b, H.5.c	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV E.4	Facilities and medical supplies at the site for appropriate emergency first aid treatment;	L.2	
IV E.5	Arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site;	L.3	
IV E.6	Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;	L.3	
IV E.7	Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary;	L.1	
IV E.8.a & b	A licensee onsite technical support center and an emergency operations facility (located between 10 miles and 25 miles of the site) from which effective direction can be given and effective control can be exercised during an emergency; and a licensee onsite operational support center	H.1, H.2	
IV E.8.c	The EOF will have the following capabilities: (1) The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; (2) The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves;	H.2	
IV E.8.d	For nuclear power reactor licensees, an alternative facility (or facilities) that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and collectively having the following characteristics: the capability for communication with the emergency operations facility, control room, and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation, for use when onsite emergency facilities cannot be safely accessed during hostile action.	H.1.b, H.1.c	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV E.9	At least one onsite and one offsite communications system; each system shall have a backup power source. All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication.	F.1	
IV E.9.a	Where consistent with the function of the governmental agency, these arrangements will include: Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.	N.2	
IV E.9.b	Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.	N.2	
IV E.9.c	Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.	N.2	
IV E.9.d	Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility. Such communications shall be tested monthly.	N.2	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.1 & 1.i	The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel: Directors and/or coordinators of the plant emergency organization;	O.2 O.4.a	
IV F.1.ii	Personnel responsible for accident assessment, including control room shift personnel;	O.4.b	
IV F.1.iii	Radiological monitoring teams;	O.4.c	
IV F.1.iv	Fire control teams (fire brigades);	O.4.d	
IV F.1.v	Repair and damage control teams;	O.4.e	
IV F.1.vi	First aid and rescue teams;	O.4.f	
IV F.1.vii	Medical support personnel;	O.4.h	
IV F.1.viii	Licensee's headquarters support personnel;	O.4.i	
IV F.1.ix	Security personnel.	O.4.d.2	
IV F.1	In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.	O.4.g, G.5, P.3	
IV F.2	The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties.	N.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.2.a	A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located. Nuclear power reactor licensees shall submit exercise scenarios under §50.4 at least 60 days before use in a full participation exercise	N.1	
IV F.2.b	Each licensee at each site shall conduct an exercise of its onsite emergency plan every 2 years. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section. In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities.	N.1	
IV F.2.c	Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period.	N.1	
IV F.2.d	A State should fully participate in the ingestion pathway portion of exercises at least once every six years. In States with more than one site, the State should rotate this participation from site to site.	N.1 a	
IV F.2.d (continued)	Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise	Not addressed in the VCSNS Emergency Plan	Offsite Responsibility
IV F.2.e	Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.	N.1.b	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.2.f	Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency or determined that the ERO has maintained key skills specific to emergency response. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.	N.1.a	
IV F.2.g	All exercises, drills, and training that provide performance opportunities to develop, maintain, or demonstrate key skills must provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified in a critique of exercises, drills, or training must be corrected.	N.4, N.5	
IV F.2.h	The participation of State and local governments in an emergency exercise is not required to the extent that the applicant has identified those governments as refusing to participate further in emergency planning activities, pursuant to 10 CFR 50.47(c)(1). In such cases, an exercise shall be held with the applicant or licensee and such governmental entities as elect to participate in the emergency planning process.	N/A	
IV F.2.i	Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action. Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.	N.1, N.2	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.2.j	The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each eight calendar year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance developed under § 50.54(hh)(2), and integration of offsite resources with onsite response. The licensee shall maintain a record of exercises conducted during each eight year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph.	N	
IV G	Provisions to be employed to ensure that the emergency plan, its implementing procedures, and emergency equipment and supplies are maintained up to date shall be described.	P.3	
IV H	Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed shall be described.	M.1.a	
IV I	a range of protective actions to protect onsite personnel during hostile action must be developed to ensure the continued ability of the licensee to safely shut down the reactor and perform the functions of the licensee's emergency plan		

Table 2 – 10 CFR 50.47 Emergency Plans

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 1	Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned,	A.1	
(b) 1 (continued)	the emergency responsibilities of the various supporting organizations have been specifically established,	A.1	
(b) 1 (continued)	and each principal response organization has staff to respond and to augment its initial response on a continuous basis.	A.4	
(b) 2	On-shift facility licensee responsibilities for emergency response are unambiguously defined,	B.1	
(b) 2 (continued)	adequate staffing to provide initial facility accident response in key functional areas is maintained at all times,	Appendix 7	
(b) 2 (continued)	timely augmentation of response capabilities is available	B.5.a	
(b) 2 (continued)	and the interfaces among various onsite response activities and offsite support and response activities are specified.	Figure A-2	
(b) 3	Arrangements for requesting and effectively using assistance resources have been made,	A.3	
(b) 3 (continued)	arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made,	C.2	
(b) 3 (continued)	and other organizations capable of augmenting the planned response have been identified.	C.4	
(b) 4	A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee,	D.1	
(b) 4 (continued)	and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	E.2.b	
(b) 5	Procedures have been established for notification, by the licensee, of State and local response organizations	E.2.b	
(b) 5 (continued)	and for notification of emergency personnel by all organizations;	E.2	

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 5 (continued)	the content of initial and follow up messages to response organizations and the public has been established;	E.3, E.4	
(b) 5 (continued)	and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.	E.6	
(b) 6	Provisions exist for prompt communications among principal response organizations to emergency personnel	F.1	
(b) 6 (continued)	and to the public.	G.4	
(b) 7	Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors),	G.1	
(b) 7 (continued)	the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance,	G.2	
(b) 7 (continued)	and procedures for coordinated dissemination of information to the public are established.	G.3, G.4	
(b) 8	Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	H.1, H.2, H.3	
(b) 9	Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	I	
(b) 10	A range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public.	J	
(b) 10 (continued)	Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place,	J.10.m.1, Figure J-2	
(b) 10 (continued)	Evacuation time Estimates have been developed and shall be updated on a periodic basis	Appendix 5	
(b) 10 (continued)	and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	J.11	

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 11	Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.	K.1	
(b) 12	Arrangements are made for medical services for contaminated injured individuals.	L.1	
(b) 13	General plans for recovery and reentry are developed.	M.1	
(b) 14	Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities,	N.1, N.2	
(b) 14 (continued)	periodic drills are (will be) conducted to develop and maintain key skills,	N.2	
(b) 14 (continued)	and deficiencies identified as a result of exercises or drills are (will be) corrected.	N.5	
(b) 15	Radiological emergency response training is provided to those who may be called on to assist in an emergency.	O.1, O.2, O.3, O.4, O.5	
(b) 16	Responsibilities for plan development and review and for distribution of emergency plans are established,	P	
(b) 16 (continued)	and planners are properly trained.	P.1	

Table 3 – NUREG-0654 Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
A.1.a	Each plan shall identify the State, local, Federal and private sector organizations (including utilities), that are intended to be part of the overall response organization for Emergency Planning Zones. (See Appendix 5).	A.1	
A.1.b	Each organization and sub organization having an operational role shall specify its concept of operations, and its relationship to the total effort.	A.1	
A.1.c	Each plan shall illustrate these interrelationships in a block diagram.	A.1, Figure A-2	
A.1.d	Each organization shall identify a specific individual by title who shall be in charge of the emergency response.	A.1	
A.1.e	Each organization shall provide for 24-hour per day emergency response, including 24-hour per day manning of communications links.	A.1	
A.2.a	Each organization shall specify the functions and responsibilities for major elements and key individuals by title, of emergency response, including the following: Command and Control	A.2	Offsite Responsibility
A.2.a (continued)	Alerting and Notification		Offsite Responsibility
A.2.a (continued)	Communications		Offsite Responsibility
A.2.a (continued)	Public Information		Offsite Responsibility
A.2.a (continued)	Accident Assessment		Offsite Responsibility
A.2.a (continued)	Public Health and Sanitation		Offsite Responsibility
A.2.a (continued)	Social Services		Offsite Responsibility
A.2.a (continued)	Fire and Rescue		Offsite Responsibility
A.2.a (continued)	Traffic Control		Offsite Responsibility
A.2.a (continued)	Emergency Medical Services		Offsite Responsibility
A.2.a (continued)	Law Enforcement		Offsite Responsibility
A.2.a (continued)	Transportation		Offsite Responsibility
A.2.a (continued)	Protective Response (including authority to request Federal assistance and to initiate other protective actions), and		Offsite Responsibility
A.2.a (continued)	Radiological Exposure Control.		Offsite Responsibility

PLANNING ELEMENT	**STATEMENT**	**EPLAN**	COMMENTS
A.2.a (continued)	The description of these functions shall include a clear and concise summary such as a table of primary and support responsibilities using the agency as one axis, and the function as the other. (See Section B for licensee).		Offsite Responsibility
A.2.b	Each plan shall contain (by reference to specific acts, codes or statutes) the legal basis for such authorities.		Offsite Responsibility
A.3	Each plan shall include written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the Emergency Planning Zones. The agreements shall identify the emergency measures to be provided and the mutually acceptable criteria for their implementation, and specify the arrangements for exchange of information. These agreements may be provided in an appendix to the plan or the plan itself may contain descriptions of these matters and a signature page in the plan may serve to verify the agreements. The signature page format is appropriate for organizations where response functions are covered by laws, regulations or executive orders where separate written agreements are not necessary.	A.3	
A.4	Each principal organization shall be capable of continuous (24-hour) operations for a protracted period.	A.4	
A.4 (continued)	The individual in the principal organization who will be responsible for assuring continuity of resources (technical, administrative, and material) shall be specified by title.	A.4	
B.1	Each licensee shall specify the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement.	B.1	
B.2	Each licensee shall designate an individual as emergency coordinator who shall be on shift at all times and who shall have the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations to authorities responsible for implementing offsite emergency measures.	B.2	
B.3	Each licensee shall identify a line of succession for the emergency coordinator position and identify the specific conditions for higher level utility officials assuming this function.	B.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
B.4	Each licensee shall establish the functional responsibilities assigned to the emergency coordinator and shall clearly specify which responsibilities may not be delegated to other elements of the emergency organization.	B.4	
B.4 (continued)	Among the responsibilities which may not be delegated shall be the decision to notify and to recommend protective actions to authorities responsible for offsite emergency measures.	B.4	
B.5	Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1. The implementation schedule for licensed operators, auxiliary operators and the shift technical advisor on shift shall be as specified in the July 31, 1980 letter to all power reactor licensees. Any deficiencies in the other staffing requirements of Table B-1 must be capable of augmentation within 30 minutes by September 1, 1981, and such deficiencies must be fully removed by July 1, 1982.	B.5	
B.6	Each licensee shall specify the interfaces between and among the onsite functional areas of emergency activity, licensee headquarters support, local services support, and State and local government response organization.	B.6	
B.6 (continued)	This shall be illustrated in a block diagram and shall include the onsite technical support center and the operational support (assembly) center and the licensee's near-site Emergency Operations Facility (EOF)	B.6, Figure B-1.a, Annex Tables 2-1	
B.7	Each licensee shall specify the corporate management, administrative, and technical support personnel who will augment the plant staff as specified in the table entitled "Minimum Staffing Requirements for Nuclear Power Plant Emergencies," (Table B-1) and in the following areas:	B.5, Figure B-1.a, Annex Tables 2-1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
B.7.a	a. logistics support for emergency personnel, e.g., transportation, communications, temporary quarters, food and water, sanitary facilities in the field, and special equipment and supplies procurement;	B.5	
B.7.b	b. technical support for planning and reentry/recovery operations;	M.2	
B.7.c	c. management level interface with governmental authorities; and	B.5	
B.7.d	d. release of information to news media during an emergency (coordinated with governmental authorities).	G.4	
B.8	Each licensee shall specify the contractor and private organizations who may be requested to provide technical assistance to and augmentation of the emergency organization.	B.8	
B.9	Each licensee shall identify the services to be provided by local agencies for handling emergencies, e.g., police, ambulance, medical, hospital, and fire-fighting organizations shall be specified.	B.8	
B.9 (continued)	The licensee shall provide for transportation and treatment of injured personnel who may also be contaminated.	L.3	
B.9 (continued)	Copies of the arrangements and agreements reached with contractor, private, and local support agencies shall be appended to the plan. The agreements shall delineate the authorities, responsibilities, and limits on the actions of the contractor, private organization, and local services support groups.	B.8, Appendix 2	
C.1.a	The Federal government maintains in-depth capability to assist licensees, States and local governments through the Federal Radiological Monitoring and Assessment Plan (formerly Radiological Assistance Plan (RAP) and Interagency Radiological Assistance Plan (IRAP).* Each State and licensee shall make provisions for incorporating the Federal response capability into its operation plan, including the following: ** FEMA issued the Federal Radiological Emergency Response Plan (FRERP) on May 8, 1996 (61 FR 20944), which supersedes these documents.(Source NUREG-0654 Addenda Mar 2002)* a. specific persons by title authorized to request Federal assistance; see A.l.d., A.2.a.	C.1	
C.1.b	b. specific Federal resources expected, including expected times of arrival at specific nuclear facility sites; and	C.1.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
C.1.c	c. specific licensee, State and local resources available to support the Federal response, e.g., airfields, command posts, telephone lines, radio frequencies and telecommunications centers.	C.1.c	
C.2.a	Each principal offsite organization may dispatch representatives to the licensee's near-site Emergency Operations Facility. (State technical analysis representatives at the near site EOF are preferred.)	C.2	Offsite Responsibility
C.2.b	b. The licensee shall prepare for the dispatch of a representative to principal offsite governmental emergency operations centers.	C.2	
C.3	Each organization shall identify radiological laboratories and their general capabilities and expected availability to provide radiological monitoring and analyses services which can be used in an emergency.	C.3	
C.4	Each organization shall identify nuclear and other facilities, organizations or individuals which can be relied upon in an emergency to provide assistance. Such assistance shall be identified and supported by appropriate letters of agreement.	C.4	
D.1	An emergency classification and emergency action level scheme as set forth in Appendix 1must be established by the licensee.	D.1	
D.1 (continued)	The specific instruments, parameters or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures.	Annex 1, 2, & 3 Section 4	
D.1 (continued)	The plan shall identify the parameter values and equipment status for each emergency class.	Annex 1, 2, & 3 Section 4	
D.2	The initiating conditions shall include the example conditions found in Appendix I and all postulated accidents in the Final Safety Analysis Report (FSAR) for the nuclear facility.	Annex 1, 2, & 3 Section 4	
D.3	Each State and local organization shall establish an emergency classification and emergency action level scheme consistent with that established by the facility licensee.	D.3	Offsite Responsibility
D.4	Each State and local organization should have procedures in place that provide for emergency actions to be taken which are consistent with the emergency actions recommended by the nuclear facility licensee, taking into account local offsite conditions that exist at the time of the emergency.	D.4	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
E.1	Each organization shall establish procedures which describe mutually agreeable bases for notification of response organizations consistent with the emergency classification and action level scheme set forth in Appendix 1. These procedures shall include means for verification of messages. The specific details of verification need not be included in the plan.	E.1	
E.2	Each organization shall establish procedures for alerting, notifying, and mobilizing emergency response personnel.	E.2	
E.3	The licensee in conjunction with State and local organizations shall establish the contents of the initial emergency messages to be sent from the plant. These measures shall contain information about the class of emergency, whether a release is taking place, potentially affected population and areas, and whether protective measures may be necessary.	E.3	
E.4.a	Each licensee shall make provisions for follow up messages from the facility to offsite authorities which shall contain the following information if it is known and appropriate: a. location of incident and name and telephone number (or communications channel identification) of caller;	E.4	
E.4.b	b. date/time of incident;	E.4	
E.4.c	c. class of emergency;	E.4	
E.4.d	d. type of actual or projected release (airborne, waterborne, surface spill), and estimated duration/impact times;	E.4	
E.4.e	e. estimate of quantity of radioactive material released or being released and the points and height of releases;	E.4	
E.4.f	f. chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines and particulates;	E.4	
E.4.g	g. meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability, precipitation, if any);	E.4	
E.4.h	h. actual or projected dose rates at site boundary; projected integrated dose at site boundary;	E.4	
E.4.i	i. projected dose rates and integrated dose at the projected peak and at 2, 5 and 10 miles, including sector(s) affected;	E.4	
E.4.j	j. estimate of any surface radioactive contamination in plant, onsite or offsite;	E.4	

PLANNING ELEMENT	**STATEMENT**	**EPLAN**	COMMENTS
E.4.k	k. licensee emergency response actions underway;	E.4	
E.4.l	l. recommended emergency actions, including protective measures;	E.4	
E.4.m	m. request for any needed onsite support by offsite organizations; and	E.4	
E.4.n	n. prognosis for worsening or termination of event based on plant information.	E.4	
E.5	State and local government organizations shall establish a system for disseminating to the public appropriate information contained in initial and follow up messages received from the licensee including the appropriate notification to appropriate broadcast media, e.g., the Emergency Broadcast System (EBS).* ** The Emergency Broadcast System (EBS) was replaced by the Emergency Alert System (EAS) by a Report and Order that the Federal Communications Commission issued on December 28, 1994 (59 FR 67090).(Source NUREG-0654 Addenda Mar 2002)*	E.5	Offsite Responsibility
E.6	Each organization shall establish administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone. (See Appendix 3.) It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. It shall be the responsibility of the State and local governments to activate such a system.	E.6	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
E.7	Each organization shall provide written messages intended for the public, consistent with the licensee's classification scheme. In particular, draft messages to the public giving instruction with regard to specific protective actions to be taken by occupants of affected areas shall be prepared and included as part of the State and local plans. Such messages should include the appropriate aspects of sheltering, ad hoc, respiratory protection, e.g., handkerchief over mouth, thyroid blocking or evacuation. The role of the licensee is to provide supporting information for the messages. For ad hoc respiratory protection see "Respiratory Protective Devices Manual" American Industrial Hygiene Association, 1963 pp. 123-126.* ** The current Respiratory Protective Devices Manual (2nd edition) and the forthcoming 3rd edition do not contain a similar table for ad hoc respiratory protection; however, according to the American Industrial Hygiene Association, it is still correct to refer to the 1963 manual as the most recent version of the Respiratory Protection Manual that contains the ad hoc respiratory protection table.(Source NUREG-0654 Addenda Mar 2002)*	E.7	
F.1	The communication Plans for emergencies shall include organizational titles and alternates for both ends of the communication links.	F.1	
F.1 (continued)	Each organization shall establish reliable primary and backup means of communication for licensees, local, and State response organizations. Such systems should be selected to be compatible with one another.	F.1	
F.1.a	Each plan shall include: a. provision for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions.	F.1	
F.1.b	b. provision for communications with contiguous State/local governments within the Emergency Planning Zones;	F.1	
F.1.c	c. provision for communications as needed with Federal emergency response organizations;	F.1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
F.1.d	d. provision for communications between the nuclear facility and the licensee's near-site Emergency Operations Facility, State and local emergency operations center, and radiological monitoring teams;	F.1	
F.1.e	e. provision for alerting or activating emergency personnel in each response organization; and	F.1	
F.1.f	f. provision for communication by the licensee with NRC headquarters and NRC Regional Office Emergency Operations Centers and the licensee's near-site Emergency Operations Facility and radiological monitoring team assembly area.	F.1	
F.2	Each organization shall ensure that a coordinated communication link for fixed and mobile medical support facilities exists.	F.2	
F.3	Each organization shall conduct periodic testing of the entire emergency communications system (see evaluation criteria H.10, N.2.a and Appendix 3).	F.3, N.2	
G.1	Each organization shall provide a coordinated periodic (at least annually) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency.	G.1	
G.1.a	This information shall include, but not necessarily be limited to: a. educational information on radiation;	G.1.a	
G.1.b	b. contact for additional information;	G.1.b	
G.1.c	c. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and	G.1.c	
G.1.d	d. special needs of the handicapped.	G.1.e	
G.1 (continued)	Means for accomplishing this dissemination may include, but are not necessarily limited to: information in the telephone book; periodic information in utility bills; posting in public areas; and publications distributed on an annual basis.	G.1	
G.2	The public information program shall provide the permanent and transient adult population within the plume exposure EPZ an adequate opportunity to become aware of the information annually. The programs should include provision for written material that is likely to be available in a residence during an emergency.	G.2	
G.2 (continued)	Updated information shall be disseminated at least annually.	G.1	

PLANNING ELEMENT	**STATEMENT**	**EPLAN**	COMMENTS
G.2 (continued)	Signs or other measures (e.g., decals, posted notices or other means, placed in hotels, motels, gasoline stations and phone booths) shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an emergency or accident occurs.	G.2	
G.2 (continued)	Such notices should refer the transient to the telephone directory or other source of local emergency information and guide the visitor to appropriate radio and television frequencies.	G.2	
G.3.a	a. Each principal organization shall designate the points of contact and physical locations for use by news media during an emergency.	G.3	
G.3.b	b. Each licensee shall provide space which may be used for a limited number of the news media at the near site Emergency Operations Facility.	G.3.b	
G.4.a	a. Each principal organization shall designate a spokesperson who should have access to all necessary information.	G.4.a	
G.4.b	b. Each organization shall establish arrangements for timely exchange of information among designated spokespersons.	G.4.b	
G.4.c	c. Each organization shall establish coordinated arrangements for dealing with rumors.	G.4.b	
G.5	Each organization shall conduct coordinated programs at least annually to acquaint news media with the emergency plans, information concerning radiation, and points of contact for release of public information in an emergency.	G.5	
H.1	Each licensee shall establish a Technical Support Center and an onsite Operational Support Center (assembly area) in accordance with NUREG-0696, Revision 1.* **"Revision 1" should be deleted; NUREG-0696 has not been revised.(Source NUREG-0654 Addenda Mar 2002)*	H.1.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
H.2	Each licensee shall establish an Emergency Operations Facility from which evaluation and coordination of all licensee activities related to an emergency is to be carried out and from which the licensee shall provide information to Federal, State and local authorities responding to radiological emergencies in accordance with NUREG-0696, Revision 1.* *"Revision 1" should be deleted; NUREG-0696 has not been revised.(Source NUREG-0654 Addenda Mar 2002)*	H.2	
H.3	Each organization shall establish an emergency operations center for use in directing and controlling response functions.	H.4	Offsite Responsibility
H.4	Each organization shall provide for timely activation and staffing of the facilities and centers described in the plan.	H.5	
H.5.a	Each licensee shall identify and establish onsite monitoring systems that are to be used to initiate emergency measures in accordance with Appendix 1, as well as those to be used for conducting assessment. The equipment shall include: a. geophysical phenomena monitors, (e.g., meteorological, hydrologic, seismic);	H.6.a	
H.5.b	b. radiological monitors, (e.g., process, area, emergency, effluent, wound and portable monitors and sampling equipment);	H.6.b	
H.5.c	c. process monitors, (e.g., reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, status or lineup of equipment components); and	H.6.c	
H.5.d	d. fire and combustion products detectors.	H.6.d	
H.6.a	Each licensee shall make provision to acquire data from or for emergency access to offsite monitoring and analysis equipment including: a. geophysical phenomena monitors, (e.g., meteorological, hydrologic, seismic);	H.6.a	
H.6.b	b. radiological monitors including radiometers and sampling devices.	H.6.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
H.6.b (continued)	Dosimetry shall be provided and shall meet, as a minimum, the NRC Radiological Assessment Branch Technical position for the Environmental Radiological Monitoring Program; and	H.7.b	
H.6.c	c. laboratory facilities, fixed or mobile.	H.7.c	
H.7	Each organization, where appropriate, shall provide for offsite radiological monitoring equipment in the vicinity of the nuclear facility.	H.7	
H.8	Each licensee shall provide meteorological instrumentation and procedures which satisfy the criteria in Appendix 2,	H.9	
H.8 (continued)	And provisions to obtain representative current meteorological information from other sources.	H.9	
H.9	Each licensee shall provide for an onsite Operational Support Center (assembly area) which shall have adequate capacity, and supplies, including, for example, respiratory protection,	H.10	
H.9 (continued)	protective clothing,	H.10	
H.9 (continued)	portable lighting,	H.10	
H.9 (continued)	portable radiation monitoring equipment,	H.10	
H.9 (continued)	cameras and	H.10	
H.9 (continued)	communications equipment for personnel present in the assembly area.	H.11	
H.10	Each organization shall make provisions to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use.	H.11	
H.10 (continued)	There shall be sufficient reserves of instruments/equipment to replace those which are removed from emergency kits for calibration or repair.	H.11	
H.10 (continued)	Calibration of equipment shall be at intervals recommended by the supplier of the equipment.	H.11	
H.11	Each plan shall, in an appendix, include identification of emergency kits by general category (protective equipment, communications equipment, radiological monitoring equipment and emergency supplies).	H.12	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
H.12	Each organization shall establish a central point (preferably associated with the licensee's near-site Emergency Operations Facility), for the receipt and analysis of all field monitoring data and coordination of sample media.	H.14	
I.1	Each licensee shall identify plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents, and shall identify the plant parameter values or other information, which correspond to the example initiating conditions of Appendix 1.	I.1	
I.1 (continued)	Such parameter values and the corresponding emergency class shall be included in the appropriate facility emergency procedures.	I.1	
I.1 (continued)	Facility emergency procedures shall specify the kinds of instruments being used and their capabilities.	I.1	
I.2	Onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident shall include: post-accident sampling capability,	I.2	
I.2 (continued)	radiation and effluent monitors,	I.2	
I.2 (continued)	in-plant iodine instrumentation, and	I.2	
I.2 (continued)	Containment radiation monitoring in accordance with NUREG-0578, as elaborated in the NRC letter to all power reactor licensees dated October 30, 1979.* ** NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, and Supplement 1 to NUREG-0737, January 1983, supersede these citations. (Source NUREG-0654 Addenda Mar 2002)*	I.2	
I.3.a	Each licensee shall establish methods and techniques to be used for determining: a. the source term of releases of radioactive material within plant systems. An example is the relationship between the containment radiation monitor(s) reading(s) and radioactive material available for release from containment.	I.3	
I.3.b	b. the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	I.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
I.4	Each licensee shall establish the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions.	I.4	
I.5	Each licensee shall have the capability of acquiring and evaluating meteorological information sufficient to meet the criteria of Appendix 2.	I.5	
I.5 (continued)	There shall be provisions for access to meteorological information by at least the near site Emergency Operations Facility, the Technical Support Center, the Control Room and an offsite NRC center.	I.5	
I.5 (continued)	The licensee shall make available to the State suitable meteorological data processing interconnections which will permit independent analysis by the State, of facility generated data in those States with the resources to effectively use this information.	I.5	
I.6	Each licensee shall establish the methodology for determining the release rate/projected doses if the instrumentation used for assessment are off scale or inoperable.	I.6	
I.7	Each organization shall describe the capability and resources for field monitoring within the plume exposure Emergency Planning Zone which are an intrinsic part of the concept of operations for the facility.	I.7	
I.8	Each organization, where appropriate, shall provide methods, equipment and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. This shall include activation,	I.8	
I.8 (continued)	notification means,	I.8	
I.8 (continued)	field team composition,	I.8	
I.8 (continued)	transportation,	I.8	
I.8 (continued)	communication,	I.8	
I.8 (continued)	monitoring equipment and	I.8	
I.8 (continued)	estimated deployment times.	I.8	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
I.9	Each organization shall have a capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7} uCi/cc (microcuries per cubic centimeter) under field conditions. Interference from the presence of noble gas and background radiation shall not decrease the stated minimum detectable activity.	I.9	
I.10	Each organization shall establish means for relating the various measured parameters (e.g., contamination levels, water and air activity levels) to dose rates for key isotopes (i.e., those given in Table 3, page 18) and gross radioactivity measurements.	I.10	
I.10 (continued)	Provisions shall be made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the protective action guides. The detailed provisions shall be described in separate procedures.	I.10	
I.11	Arrangements to locate and track the airborne radioactive plume shall be made, using either or both Federal and State resources.	I.11	Offsite Responsibility
J.1.a	Each licensee shall establish the means <u>and time</u> required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including: a. Employees not having emergency assignments;	J.1 J.1	
J.1.b	b. Visitors;	J.1	
J.1.c	c. Contractor and construction personnel; and	J.1	
J.1.d	d. Other persons who may be in the public access areas on or passing through the site or within the owner controlled area.	J.1	
J.2	Each licensee shall make provisions for evacuation routes and transportation for onsite individuals to some suitable offsite location, including alternatives for inclement weather, high traffic density and specific radiological conditions.	J.2	
J.3	Each licensee shall provide for radiological monitoring of people evacuated from the site.	J.3	
J.4	Each licensee shall provide for the evacuation of onsite non-essential personnel in the event of a Site or General Emergency and	J.4	
J.4 (continued)	shall provide a decontamination capability at or near the monitoring point specified in J.3.	J.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.5	Each licensee shall provide for a capability to account for all individuals onsite at the time of the emergency and ascertain the names of missing individuals within 30 minutes of the start of an emergency and account for all onsite individuals continuously thereafter.	J.5	
J.6.a	Each licensee shall, for individuals remaining or arriving onsite during the emergency, make provisions for: a. Individual respiratory protection;	J.6.a	
J.6.b	b. Use of protective clothing; and	J.6.b	
J.6.c	c. Use of radioprotective drugs, (e.g., individual thyroid protection).	J.6.c	
J.7	Each licensee shall establish a mechanism for recommending protective actions to the appropriate State and local authorities.	J.7	
J.7 (continued)	These shall include Emergency Action Levels corresponding to projected dose to the population-at-risk, in accordance with Appendix 1 and	J.7	
J.7 (continued)	with the recommendations set forth in Tables 2.1 and 2.2 of the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-520/1-75-001).* ** EPA issued EPA-400-R-92-001, May 1992, which supersedes this document.(Source NUREG-0654 Addenda Mar 2002)*	J.7	
J.7 (continued)	As specified in Appendix 1, prompt notification shall be made directly to the offsite authorities responsible for implementing protective measures within the plume exposure pathway Emergency Planning Zone.	J.7	
J.8	Each licensee's plan shall contain time estimates for evacuation within the plume exposure EPZ. These shall be in accordance with Appendix 4.	J.8	
J.9	Each State and local organization shall establish a capability for implementing protective measures based upon protective action guides and other criteria.	J.9	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.9 (continued)	This shall be consistent with the recommendations of EPA regarding exposure resulting from passage of radioactive airborne plumes, (EPA-520/1-75-001) and with those of DHEW (DHHS)/FDA regarding radioactive contamination of human food and animal feeds as published in the Federal Register of December 15, 1978 (43 FR 58790).* * EPA issued EPA-400-R-92-001, May 1992, which supersedes EPA-5201 1-75-001. The Food and Drug Administration (FDA), Department of Health and Human Services (DHHS), issued "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds, Recommendations for State and Local Agencies, Availability," on August 13, 1998 (63 FR 43402).(Source NUREG-0654 Addenda Mar 2002)	J.9	Offsite Responsibility
J.10.a	The organization's plans to implement protective measures for the plume exposure pathway shall include: a. Maps showing evacuation routes,	J.10.a	
J.10.a (continued)	evacuation areas,	J.10.a	
J.10.a (continued)	preselected radiological sampling and monitoring points, (identification of radiological sampling and monitoring points shall include the designators in Table J-1 or an equivalent uniform system described in the plan);		
J.10.a (continued)	relocation centers in host areas,	J.10.a	
J.10.a (continued)	and shelter areas.	J.10.a	
J.10.b	b. Maps showing population distribution around the nuclear facility. This shall be by evacuation areas (licensees shall also present the information in a sector format);	J.10,b	
J.10.c	c. Means for notifying all segments of the transient and resident population;	J.10.c	
J.10.d	d. Means for protecting those persons whose mobility may be impaired due to such factors as institutional or other confinement;	J.10.d	Offsite Responsibility
J.10.e	e. Provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ whose immediate evacuation may be infeasible or very difficult,	J.10.e	Offsite Responsibility
J.10.e (continued)	including quantities, storage, and means of distribution.	J.10.e	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.10.f	f. State and local organizations' plans should include the method by which decisions by the State Health Department for administering radioprotective drugs to the general population are made during an emergency	J.10.f	Offsite Responsibility
J.10.f (continued)	and the predetermined conditions under which such drugs may be used by offsite emergency workers;* ** The Food and Drug Administration (FDA) issued "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency," on December 11, 2001 (66 FR 238:64046), which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)*	J.10.f	Offsite Responsibility
J.10.g	g. Means of relocation;	J.10.g	Offsite Responsibility
J.10.h	h. Relocation centers in host areas which are at least 5 miles, and preferably 10 miles, beyond the boundaries of the plume exposure emergency planning zone; (See K.8)	J.10.h	Offsite Responsibility
J.10.i	i. Projected traffic capacities of evacuation routes under emergency conditions;	J.10.i	Offsite Responsibility
J.10.j	j. Control of access to evacuated areas and organization responsibilities for such control;	J.10.j	Offsite Responsibility
J.10.k	k. Identification of and means for dealing with potential impediments (e.g., seasonal impassability of roads) to use of evacuation routes, and contingency measures;	J.10.k	Offsite Responsibility
J.10.l	l. Time estimates for evacuation of various sectors and distances based on a dynamic analysis (time-motion study under various conditions) for the plume exposure pathway emergency planning zone (See Appendix 4); and	J.10.l	Offsite Responsibility
J.10.m	m. The bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions.	J.10.m	
J.10.m (continued)	This shall include expected local protection afforded * in residential units or other shelter for direct and inhalation exposure, as well as evacuation time estimates. **EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)*	J.10.m	
J.11	Each State shall specify the protective measures to be used for the ingestion pathway, including the methods for protecting the public from consumption of contaminated foodstuffs.	J.11	Offsite Responsibility
J.11 (continued)	This shall include criteria for deciding whether dairy animals should be put on stored feed.	J.11	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.11 (continued)	The plan shall identify procedures for detecting contamination,	J.11	Offsite Responsibility
J.11 (continued)	for estimating the dose commitment consequences of uncontrolled ingestion,	J.11	Offsite Responsibility
J.11 (continued)	and for imposing protection procedures such as impoundment, decontamination, processing, decay, product diversion, and preservation.	J.11	Offsite Responsibility
J.11 (continued)	Maps for recording survey and monitoring data, key land use data (e.g., farming), dairies, food processing plants, water sheds, water supply intake and treatment plants and reservoirs shall be maintained.	J.11	Offsite Responsibility
J.11 (continued)	Provisions for maps showing detailed crop information may be by including reference to their availability and location and a plan for their use.	J.11	Offsite Responsibility
J.11 (continued)	The maps shall start at the facility and include all of the 50-mile ingestion pathway EPZ.	J.11	Offsite Responsibility
J.11 (continued)	Up-to-date lists of the name and location of all facilities which regularly process milk products and other large amounts of food or agricultural products originating in the ingestion pathway Emergency Planning Zone, but located elsewhere, shall be maintained.	J.11	Offsite Responsibility
J.12	Each organization shall describe the means for registering and monitoring of evacuees at relocation centers in host areas.	J.12	Offsite Responsibility
J.12 (continued)	The personnel and equipment available should be capable of monitoring within about a 12 hour period all residents and transients in the plume exposure EPZ arriving at relocation centers.	J.12	Offsite Responsibility
K.1.a	Each licensee shall establish onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA-520/1-75/001) for:* ** EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)* a. removal of injured persons;	K.1 K.1	
K.1.b	b. undertaking corrective actions;	K.1	
K.1.c	c. performing assessment actions;	K.1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
K.1.d	d. providing first aid;	K.1	
K.1.e	e. performing personnel decontamination;	K.1	
K.1.f	f. providing ambulance service; and	K.1	
K.1.g	g. providing medical treatment services.	K.1	
K.2	Each licensee shall provide an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. The plan shall identify individual(s), by position or title, who can authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits.	K.2	
K.2 (continued)	Procedures shall be worked out in advance for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures shall include expeditious decision making and a reasonable consideration of relative risks.	K.2	
K.3.a	a. Each organization shall make provision for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any nuclear accident, including volunteers.	K.3	
K.3.a (continued)	Each organization shall make provisions for distribution of dosimeters, both self-reading and permanent record devices.	K.3	
K.3.b	Each organization shall ensure that dosimeters are read at appropriate frequencies and	K.3	
K.3.b (continued)	provide for maintaining dose records for emergency workers involved in any nuclear accident.	K.3	
K.4	Each State and local organization shall establish the decision chain for authorizing emergency workers to incur exposures in excess of the EPA General Public Protective Action Guides (i.e., EPA PAGs for emergency workers and lifesaving activities).	K.4	Offsite Responsibility
K.5.a	a. Each organization as appropriate, shall specify action levels for determining the need for decontamination.	K.5	
K.5.b	b. Each organization, as appropriate, shall establish the means for radiological decontamination of emergency personnel wounds, supplies, instruments and equipment, and for waste disposal.	K.5	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
K.6.a	Each licensee shall provide onsite contamination control measures including: a. area access control;	K.6.a	
K.6.b	b. drinking water and food supplies;	K.6.b	
K.6.c	c. criteria for permitting return of areas and items to normal use, see Draft ANSI 13.12.* **EPA PAG Manual, EPA 400-R-92-001 (see items 16 and 17), and the Food and Drug Administration, DHHS, "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies," dated August 13, 1998 (63 FR 43402) supersede this citation.(Source NUREG-0654 Addenda Mar 2002)*	K.6.c	
K.7	Each licensee shall provide the capability for decontaminating relocated onsite personnel,	K.7	
K.7 (continued)	including provisions for extra clothing and decontaminants suitable for the type of contamination expected, with particular attention given to radioiodine contamination of the skin.	K.7	
L.1	Each organization shall arrange for local and backup hospital and medical services having the capability for evaluation of radiation exposure and uptake,	L.1	
L.1 (continued)	Including assurance that persons providing these services are adequately prepared to handle contaminated individuals.	L.1	
L.2	Each licensee shall provide for onsite first aid capability.	L.2	
L.3	Each State shall develop lists indicating the location of public, private and military hospitals and other emergency medical services facilities within the State or contiguous States considered capable of providing medical support for any contaminated injured individual.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued)	The listing shall include the name, location, type of facility and capacity and any special radiological capabilities.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued)	These emergency medical services should be able to radiologically monitor personnel contamination, and	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued	have facilities and trained personnel able to care for contaminated injured persons.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.4	Each organization shall arrange for transporting victims of radiological accidents to medical support facilities.	L.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
M.1	Each organization, as appropriate, shall develop general plans and procedures for reentry and recovery and describe the means by which decisions to relax protective measures (e.g., allow reentry into an evacuated area) are reached.	M.1	
M.1 (continued)	This process should consider both existing and potential conditions.	M.1	
M.2	Each licensee plan shall contain the position/title, authority and responsibilities of individuals who will fill key positions in the facility recovery organization.	M.2.a	
M.2 (continued)	This organization shall include technical personnel with responsibilities to develop, evaluate and direct recovery and reentry operations. The recovery organization recommended by the Atomic Industrial Forum's "Nuclear Power Plant Emergency Response Plan" dated October 11, 1979, is an acceptable framework.* **"Functional Criteria for Emergency Response Facilities," NUREG-0696, issued on February 1981, and "Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability," NUREG-0737, Supplement No. 1, issued January 1983, supersede this citation.(Source NUREG-0654 Addenda Mar 2002)*	M.2	
M.3	Each licensee and State plan shall specify means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur.	M.3	
M.4	Each plan shall establish a method for periodically estimating total population exposure.	M.4	
N.1.a	a. An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations. The emergency preparedness exercise shall simulate an emergency that results in offsite radiological releases which would require response by offsite authorities. Exercises shall be conducted as set forth in NRC and FEMA rules.	N.1.a	
N.1.b	b. An exercise shall include mobilization of State and local personnel and resources adequate to verify the capability to respond to an accident scenario requiring response.	N.1.a	

PLANNING ELEMENT	**STATEMENT**	**EPLAN**	COMMENTS
N.1.b (continued)	The organization shall provide for a critique of the annual exercise by Federal and State observers/evaluators.	N.4	
N.1.b (continued)	The scenario should be varied from year to year such that all major elements of the plans and preparedness organizations are tested within a five-year period.	N.1	
N.1.b (continued)	Each organization should make provisions to start an exercise between 6:00 p.m. and midnight, and	N.1	
N.1.b (continued)	another between midnight and 6:00 a.m. once every six years.	N.1	
N.1.b (continued)	Exercises should be conducted under various weather conditions.	N.1	
N.1.b (continued)	Some exercises should be unannounced.	N.1	
N.2.a	A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each organization shall conduct drills, in addition to the annual exercise at the frequencies indicated below: a. <u>Communication Drills</u> Communications with State and local governments within the plume exposure pathway Emergency Planning Zone shall be tested monthly.	N.2.b	
N.2.a (continued)	Communications with Federal emergency response organizations and States within the ingestion pathway shall be tested quarterly.	N.2.b	
N.2.a (continued)	Communications between the nuclear facility, State and local emergency operations centers, and field assessment teams shall be tested annually.	N.2.b	
N.2.a (continued)	Communication drills shall also include the aspect of understanding the content of messages.	N.2.b	
N.2.b	b. <u>Fire Drills</u> Fire drills shall be conducted in accordance with the plant (nuclear facility) technical specifications.	N.2.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
N.2.c	c. Medical Emergency Drills A medical emergency drill involving a simulated contaminated individual which contains provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility) shall be conducted annually. The offsite portions of the medical drill may be performed as part of the required annual exercise.	N.2.d	
N.2.d	d. Radiological Monitoring Drills Plant environs and radiological monitoring drills (onsite and offsite) shall be conducted annually.	N.2.e	
N.2.d (continued)	These drills shall include collection and analysis of all sample media (e.g., water, vegetation, soil and air), and provisions for communications and record keeping. The State drills need not be at each site. Where appropriate, local organizations shall participate.	N.2.e	
N.2.e.1	e. Health Physics Drills (I) Health Physics drills shall be conducted semi-annually which involve response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment. The State drills need not be at each site.	N.2.f	
N.2.e.2	(2) Analysis of in plant liquid samples with actual elevated radiation levels including use of the post-accident sampling system shall be included in Health Physics drills by licensees annually.	N.2.e	
N.3.a	Each organization shall describe how exercises and drills are to be carried out to allow free play for decision making and to meet the following objectives. Pending the development of exercise scenarios and exercise evaluation guidance by NRC and FEMA the scenarios for use in exercises and drills shall include but not be limited to, the following: a. The basic objective(s) of each drill and exercise and appropriate evaluation criteria;	N.3.a	
N.3.b	b. The date(s), time period, place(s) and participating organizations;	N.3.b	
N.3.c	c. The simulated events;	N.3.c	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
N.3.d	d. A time schedule of real and simulated initiating events;	N.3.e	
N.3.e	e. A narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities; and	N.3.f	
N.3.f	f. A description of the arrangements for and advance materials to be provided to official observers.	N.3.h	
N.4	Official observers from Federal, State or local governments will observe, evaluate, and critique the required exercises. A critique shall be scheduled at the conclusion of the exercise to evaluate the ability of organizations to respond as called for in the plan. The critique shall be conducted as soon as practicable after the exercise, and	N.4	
N.4 (continued)	a formal evaluation should result from the critique.	N.4	
N.5	Each organization shall establish means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and	N.5	
N.5 (continued)	for assigning responsibility for implementing corrective actions.	N.5	
N.5 (continued)	Each organization shall establish management control used to ensure that corrective actions are implemented.	N.5	
O.1.a	Each organization shall assure the training of appropriate individuals. a. Each facility to which the plant applies shall provide site specific emergency response training for those offsite emergency organizations who may be called upon to provide assistance in the event of an emergency,	O.1.a	
O.1.b	b. Each offsite response organization shall participate in and receive training. Where mutual aid agreements exist between local agencies such as fire, police and ambulance/rescue, the training shall also be offered to the other departments who are members of the mutual aid district.	O.1.b	Offsite Responsibility
O.2	The training program for members of the onsite emergency organization shall, besides classroom training, include practical drills in which each individual demonstrates ability to perform his assigned emergency function.	O.2	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
O.2 (continued)	During the practical drills, on-the-spot correction of erroneous performance shall be made and a demonstration of the proper performance offered by the instructor.	O.2	
O.3	Training for individuals assigned to licensee first aid teams shall include courses equivalent to Red Cross Multi-Media.	O.3	
O.4.a	Each organization shall establish a training program for instructing and qualifying personnel who will implement radiological emergency response plans.2/ The specialized initial training and periodic retraining programs (including the scope, nature and frequency) shall be provided in the following categories: a. Directors or coordinators of the response organizations;	O.4.a	
O.4.b	b. Personnel responsible for accident assessment;	O.4.b	
O.4.c	c. Radiological monitoring teams and radiological analysis personnel;	O.4.c	
O.4.d	d. Police, security and fire fighting personnel;	O.4.d	
O.4.e	e. Repair and damage control/correctional action teams (onsite);	O.4.e	
O.4.f	f. First aid and rescue personnel;	O.4.f	
O.4.g	g. Local support services personnel including Civil Defense/Emergency Service personnel;	O.4.g	
O.4.h	h. Medical support personnel;	O.4.h	
O.4.i	i. Licensee's headquarters support personnel;	O.4.i	
O.4.j	j. Personnel responsible for transmission of emergency information and instructions.	O.4.j	
O.5	Each organization shall provide for the initial and annual retraining of personnel with emergency response responsibilities.	O.5	
P.1	Each organization shall provide for the training of individuals responsible for the planning effort.	P.1	
P.2	Each organization shall identify by title the individual with the overall authority and responsibility for radiological emergency response planning.	P.2	
P.3	Each organization shall designate an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations.	P.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
P.4	Each organization shall update its plan and agreements as needed, review and certify it to be current on an annual basis.	P.4	
P.4 (continued)	The update shall take into account changes identified by drills and exercises.	P.4	
P.5	The emergency response plans and approved changes to the plans shall be forwarded to all organizations and appropriate individuals with responsibility for implementation of the plans.	P.5	
P.5 (continued)	Revised pages shall be dated and marked to show where changes have been made.	P.5	
P.6	Each plan shall contain a detailed listing of supporting plans and their source.	P.6	
P.7	Each plan shall contain as an appendix listing, by title, procedures required to implement the plan.	P.7	
P.7 (continued)	The listing shall include the section(s) of the plan to be implemented by each procedure.	P.7	
P.8	Each plan shall contain a specific table of contents.	Table of Contents	
P.8 (continued)	Plans submitted for review should be cross-referenced to these criteria.	P.8	
P.9	Each licensee shall arrange for and conduct independent reviews of the emergency preparedness program at least every 12 months. (An independent review is one conducted by any competent organization either internal or external to the licensees' organization, but who are not immediately responsible for the emergency preparedness program).	P.9	
P.9 (continued)	The review shall include the emergency plan, its implementing procedures and practices, training, readiness testing, equipment, and interfaces with State and local governments.	P.9	
P.9 (continued)	Management controls shall be implemented for evaluation and correction of review findings.	P.9	
P.9 (continued)	The result of the review, along with recommendations for improvements, shall be documented, reported to appropriate licensee corporate and plant management, and involved Federal, State and local organizations,	P.9	
P.9 (continued)	and retained for a period of five years.	P.9	
P.10	Each organization shall provide for updating telephone numbers in emergency procedures at least quarterly.	P.10	

Appendix 7 – On-shift Staffing Analysis

The Unit 1 On-shift Staffing Analysis was prepared by Operations Support Services, Inc. This controlled document, in its entirety, is filed under separate cover and has been distributed to designated locations.

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

ATTACHMENT VI

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

SOUTH CAROLINA ELECTRIC & GAS COMPANY
VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS
COPY NO. ___________

RADIATION EMERGENCY PLAN

EP-100
REVISION xx

SAFETY RELATED

Table of Contents .... Page

Part 1: Introduction

Section A: Purpose

As required in the conditions set forth by the Nuclear Regulatory Commission (NRC) for the operating licenses for the Virgil C. Summer Nuclear Station (VCSNS) Units 1, 2, and 3, the management of South Carolina Electric & Gas Company (SCE&G) recognizes its responsibility and authority to operate and maintain the nuclear power station in such a manner as to provide for the safety of the general public. This document describes the VCSNS Radiation Emergency Preparedness Program. The philosophy that guides the development and maintenance of this program is the protection of the health and safety of the general public in the communities around the nuclear power station and the personnel who work at VCSNS.

This Radiation Emergency Plan (Emergency Plan) establishes the concepts, evaluation and assessment criteria, and protective actions that are necessary in order to limit and mitigate the consequences of potential or actual radiological emergencies. It has been prepared to establish the procedures and practices for management control over unplanned or emergency events that may occur at VCSNS. It also provides the necessary prearrangements, directions, and organization so that all nuclear emergencies can be effectively and efficiently resolved.

The VCSNS Emergency Preparedness Program consists of the Emergency Plan, Unit Annexes, Emergency Plan Implementing Procedures (EPIPs), and associated program administrative documents. The VCSNS Emergency Plan outlines the basis for response actions that would be implemented in an emergency. This document is not intended to be used as a procedure.

The Unit Annexes are parts of the Emergency Plan and are subject to the same review and audit requirements as the Emergency Plan. In the areas where a Unit Annex deviates from the general requirements of the Emergency Plan, the Unit Annex shall serve as the controlling document.

The information that is in the Plan need not be restated in the Unit Annexes. The Annexes shall address any differences between co-located units operated by SCE&G.

Annex Format and Specific Content: As a minimum, Unit Annexes shall address the areas described as follows:

Section 1: Introduction

The unit description is provided along with the inclusion of maps, drawings, and/or diagrams. It describes the specifics of each unit and its location. A summary statement describes the Annex's interface with the Emergency Plan.

Section 2: Organizational Control of Emergencies

Unit-specific on-shift staffing is outlined in the Unit Annexes to the Emergency Plan. The on-call Emergency Response Organization (ERO) positions are outlined in Section B of the Emergency Plan.

Section 3: Classification of Emergencies

Emergency Action Levels (EALs) are developed for all emergency classes for the purpose of event classification. The EALs are incorporated into the implementing procedures for Activation and Implementation of Emergency Plan for each technology.

Section 4: Emergency Facilities and Equipment

A description of unit-specific facilities and equipment available for use during an emergency response or to support the remainder of the site is included in each Unit Annex.

Section 5: Emergency Measures

A description of unit-specific personnel protective actions, assembly areas, and evacuation routes are discussed.

Detailed EPIPs are maintained separately and are used to guide those responsible for implementing emergency response actions.

Section B: Background

Facility Description

The VCSNS site is on the east side of the Broad River in western Fairfield County. The Unit 1 power block area (generating facilities and switchyard) is on the south shore of the Monticello Reservoir. Units 2 and 3 are approximately 1 mile south-southwest of Unit 1. An exclusion area, defined as the area within approximately 1 mile of Unit 1 combined with the area 3,390 feet from the center of Units 2 and 3 (the Exclusion Area Boundary), is posted and access to land portions of this area is controlled. The Exclusion Area Boundary encompasses approximately 2,560 acres. It includes the southern portion of the Monticello Reservoir and parts of the Fairfield Pumped Storage Facility.

The largest industrial center nearest to the site is Columbia, which is approximately 26 miles southeast of the site. The nearest community is Jenkinsville, approximately three miles southeast of the site. The closest primary public road is SC 215 which lies approximately 6,800 feet east of the Unit 1 reactor building centerline and is outside the exclusion area. Highway access to the station is via SC 215 from Columbia or by Interstate 26 to US 176, and then to SC 213 and SC 215.

Figure 1-1 shows the general location of VCSNS.

Figure 1-2 shows the Exclusion Area Boundary (EAB) for Units 1, 2, and 3.

Within the EAB, ownership is divided between SCE&G and Santee Cooper. Pursuant to the VCSNS owner's agreement authorizing the development, construction, licensing, and operation of generating units, SCE&G, for itself and as agent for the co-owner, retains complete authority to regulate any and all access and activity within the entire exclusion area.

Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) for the VCSNS is an area surrounding the VCSNS site with Unit 1 at the center, with a radius of about ten miles. Principal exposure sources from the plume exposure pathway are (a) external exposure to gamma and beta radiation from the plume and from deposition materials and (b) exposure of the internal organs to gamma and beta radiation from inhaled radioactive gases and/or radioactive particles. The time of potential exposure can range from hours to days.

The Ingestion Pathway Emergency Planning Zone (IPZ) is an area surrounding the station with Unit 1 as the center with a radius of about fifty (50) miles. The primary exposure source from the ingestion exposure pathway is the ingestion of contaminated fresh vegetables and milk. The time of potential exposure can range from hours to months. Figure 1-4 shows the Ingestion Pathway EPZ.

In the context of this Emergency Plan, including the Unit Annexes and Emergency Plan Procedures (EPP), SCE&G manages the operations of the VCSNS.

The primary hazard consideration at the nuclear power station is the potential unplanned release of radioactive material resulting from an accident. The probability of such a release is considered very low due to the design of the units and strict operational guidelines enforced by the NRC. Notwithstanding, federal regulations require that a solid Emergency Preparedness Program exist for each commercial nuclear power station. A detailed description of the station is provided in each unit's Final Safety Analysis Report (FSAR).

To minimize the number of ad hoc decisions made during an emergency and to ensure that necessary equipment, supplies, and essential services are available to meet the needs of an emergency, SCE&G has developed this Emergency Plan. This Emergency Plan is applicable to VCSNS and considers the consequences of radiological emergencies, as required by 10 CFR 50.47 and 10 CFR 50 Appendix E.

In addition, this plan addresses guidance and adheres to the intent of the criteria established and provided within NUREG-0654/FEMA-REP-1 Rev. 1 (NUREG-0654), which is a joint NRC and Federal Emergency Management Agency (FEMA) document. Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," endorses the criteria and recommendations in NUREG-0654, as methods acceptable to the NRC staff for complying with the standards in 10 CFR 50.47.

The Emergency Plan also considers the consequences of nonradiological emergencies.

Section C: Scope

This document describes actions to be taken in the event of a radiological accident at the VCSNS that may impact the health and safety of the general public or station employees. It also serves to limit the damage to facilities and property, and provides for the restoration of such facilities in the event of an emergency. If such an accident were to occur, the ERO would be put in place and maintained until such time when the plant is returned to a stable condition and the threat to the general public or station personnel no longer exists. This plan describes the functions and operation of the ERO, including assignments of authority and responsibility. It does not, nor is it intended to, provide guidance for actual plant equipment manipulations. These instructions are contained in site-specific normal and Emergency Operating Procedures (EOP) as required by Technical Specifications and other regulatory guidance. The Emergency Plan provides for: identification and evaluation of emergency situations, protective measures, communications, coordination and notification of governmental authorities, document review and control, emergency preparedness assessment, and training of all emergency response personnel. A method for recovering from a declared emergency is also described in this plan.

Section D: Planning Basis

The Emergency Plan, in conjunction with the Unit Annexes and the emergency plan procedures and administrative procedures, documents the methods by which the VCSNS Emergency

Preparedness Program meets the planning standards set forth in 10 CFR 50.47(b) and the requirements of 10 CFR 50 Appendix E. Development of the Emergency Plan was based on NUREG-0654.

Acceptable alternate methods, which deviate from NUREG-0654, are allowed under Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors." However, any and all deviations will be documented in the Unit Annexes and evaluated as continuing to meet the Planning Standards of 10 CFR 50.47(b) and 10 CFR 50 Appendix E under the 10 CFR 50.54(q) process. This evaluation process is employed to ensure the continued effectiveness of the Emergency Plan and respective Unit Annexes.

Other applicable regulations, publications, and guidance were used (see Appendix 1, "References") along with site-specific documents to ensure consistency in the planning effort.

Section E: Contiguous-Jurisdiction Emergency Planning

The Emergency Plan recognizes the state of South Carolina, in cooperation with the EPZ counties (Fairfield, Lexington, Newberry, & Richland), as the overall authority responsible for Protective Action Directives (PAD) in order to protect the health and safety of the general public.

Section F: Integrated Guidance and Criteria

This plan was developed in conjunction with federal, state, and county emergency response plans to ensure a consistent and integrated response to a classified event.

Section G: Funding and Technical Assistance

SCE&G is dedicated to providing the level of support necessary, as dictated by federal regulation, to ensure appropriate integration of the state, county, and VCSNS radiological emergency preparedness programs.

Section H: Emergency Response Organization

SCE&G acknowledges its primary responsibility for planning and implementing emergency measures within the EAB and for overall plant accident assessment. These emergency measures include corrective actions, protective measures, and aid for personnel onsite. To accomplish these responsibilities, SCE&G has established an augmented ERO that will be mobilized to provide the initial response to an event classified as an Alert, Site Area Emergency, or General Emergency. The ERO may be partially or fully activated during an Unusual Event if the Interim Emergency Director (IED) determines their assistance is needed to mitigate the event. In addition, advance arrangements have been made with offsite organizations for special emergency assistance such as ambulance, medical, hospital, fire, and police services.

In the longer time frame, a framework for a Recovery Organization is set forth in this plan. It is recognized that the normal station organization will be used for much of the recovery effort, with additional resources identified at the time of the event.

Section I: Federal Response

Provisions are made within the Emergency Plan for the integration of appropriate elements of federal assistance activities. Arrangements have been made to accommodate a federal response organization presence in the VCSNS emergency response facilities as well as support communications between VCSNS and federal emergency facilities.

Section J: Form and Content of Plan

In accordance with regulatory guidance provided in NUREG-0800, the Emergency Plan is referenced in Chapter 13 of each unit's FSAR. The Emergency Plan is administratively maintained as a separate document.

Appendix 3, List of Emergency Plan Procedures, provides a subject matter cross-reference between the NUREG-0654 evaluation criteria and the EPIPs and applicable administrative documents. Appendix 6 is a specific requirements cross-reference between the Emergency Plan and 10CFR50 Appendix E, 10CFR50.47, NUREG-0654,

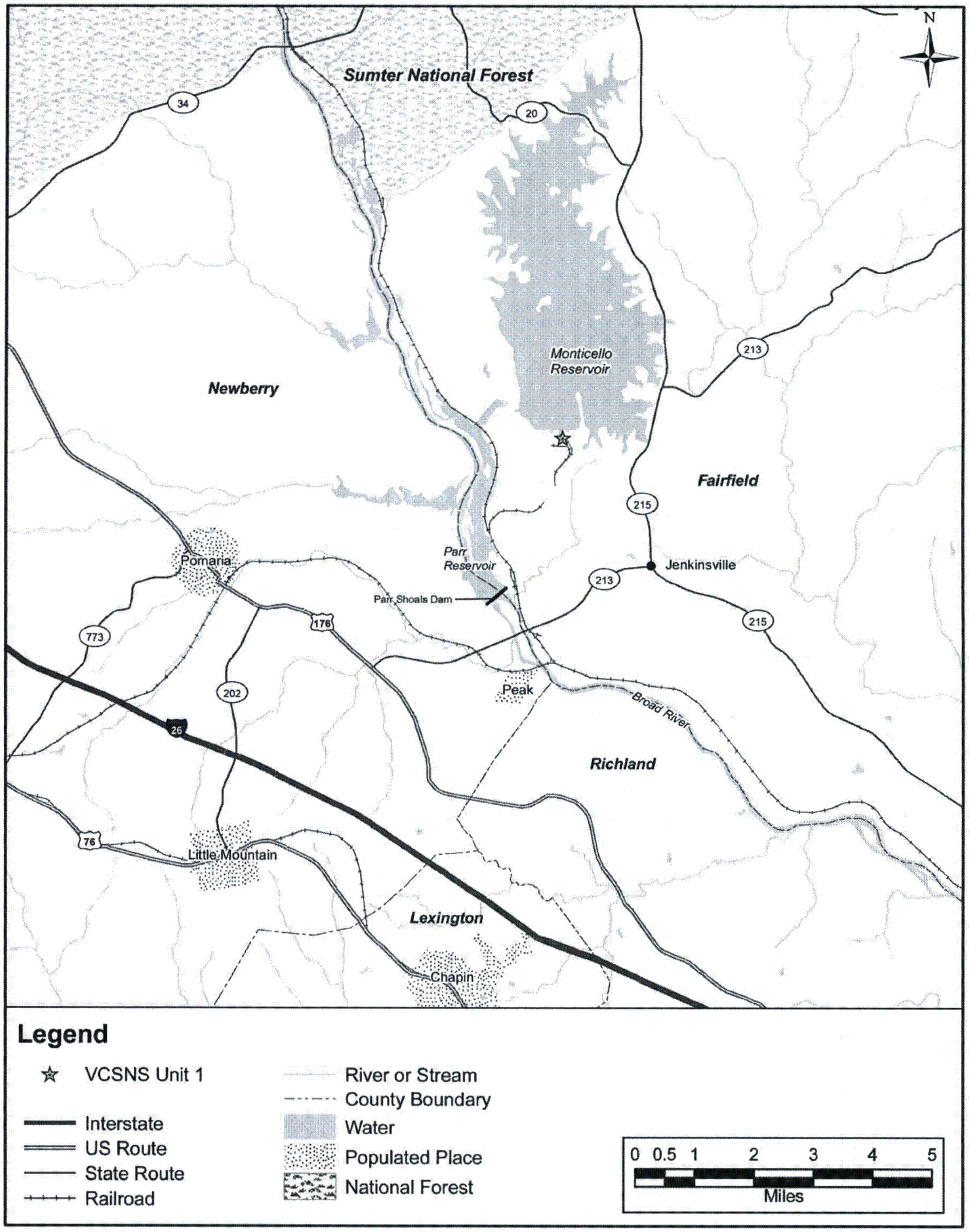


Figure 1-1 General Location of the Site and Surrounding Area

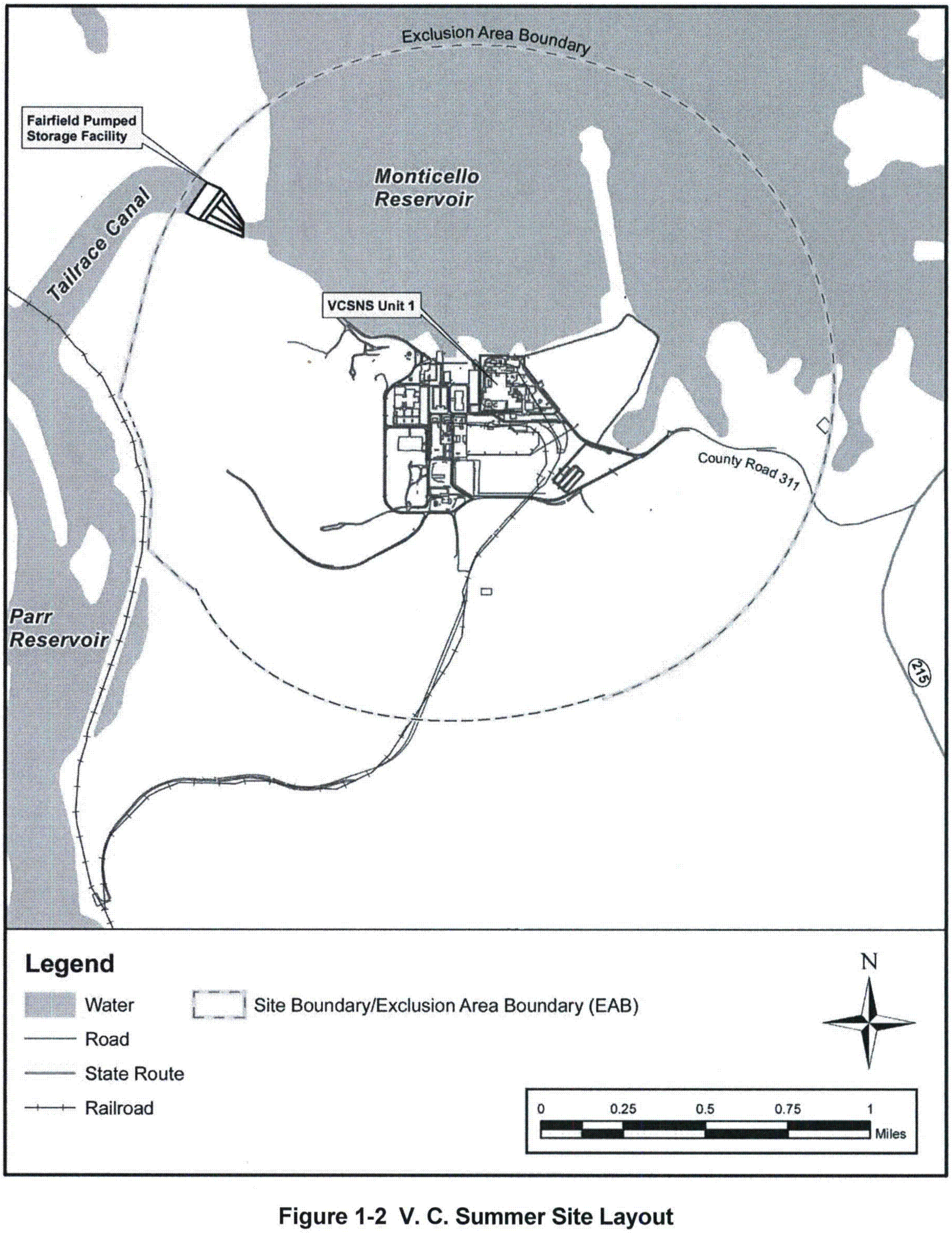


Figure 1-2 V. C. Summer Site Layout

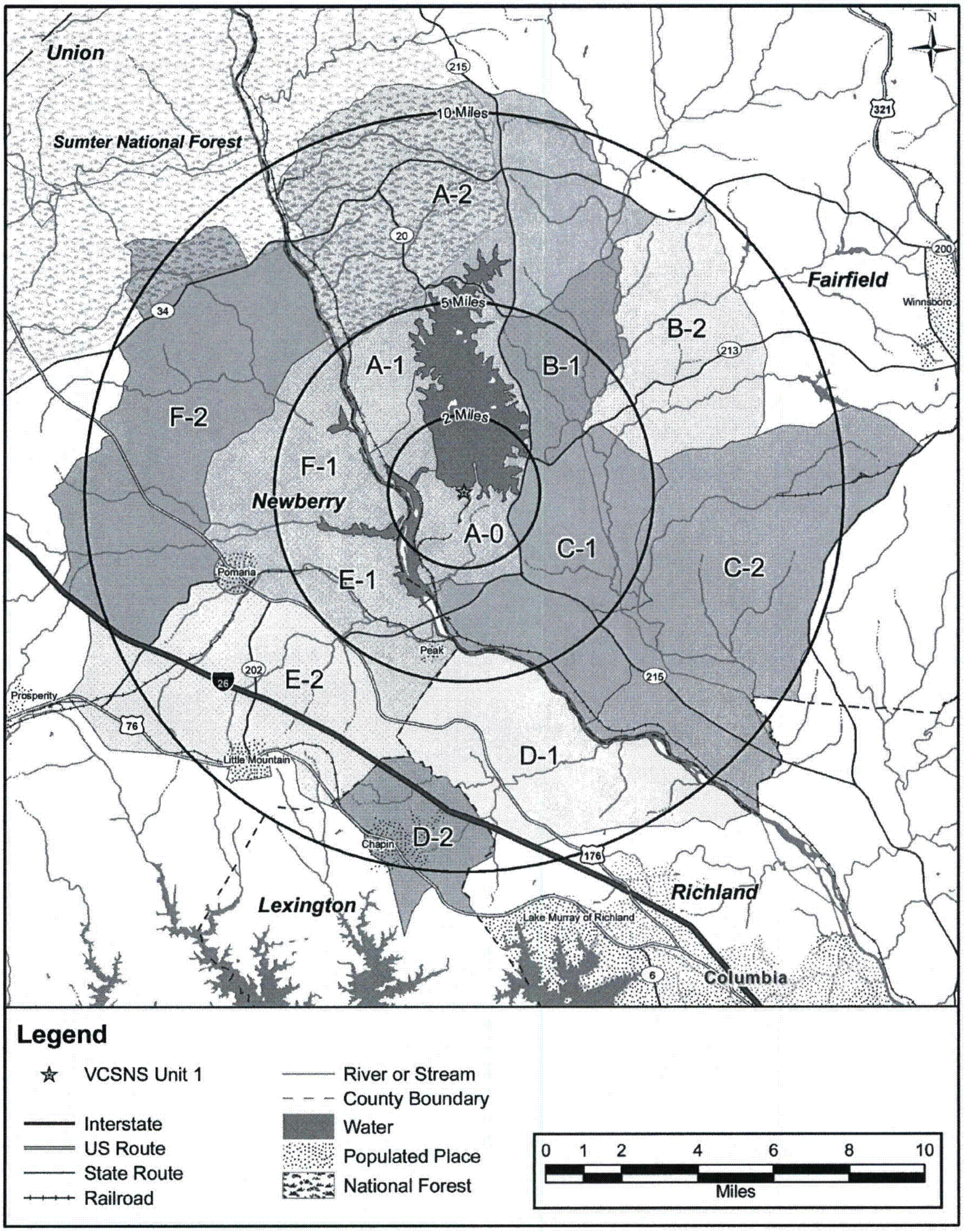


Figure 1-3 10-Mile Emergency Planning Zone (Exposure Pathway)

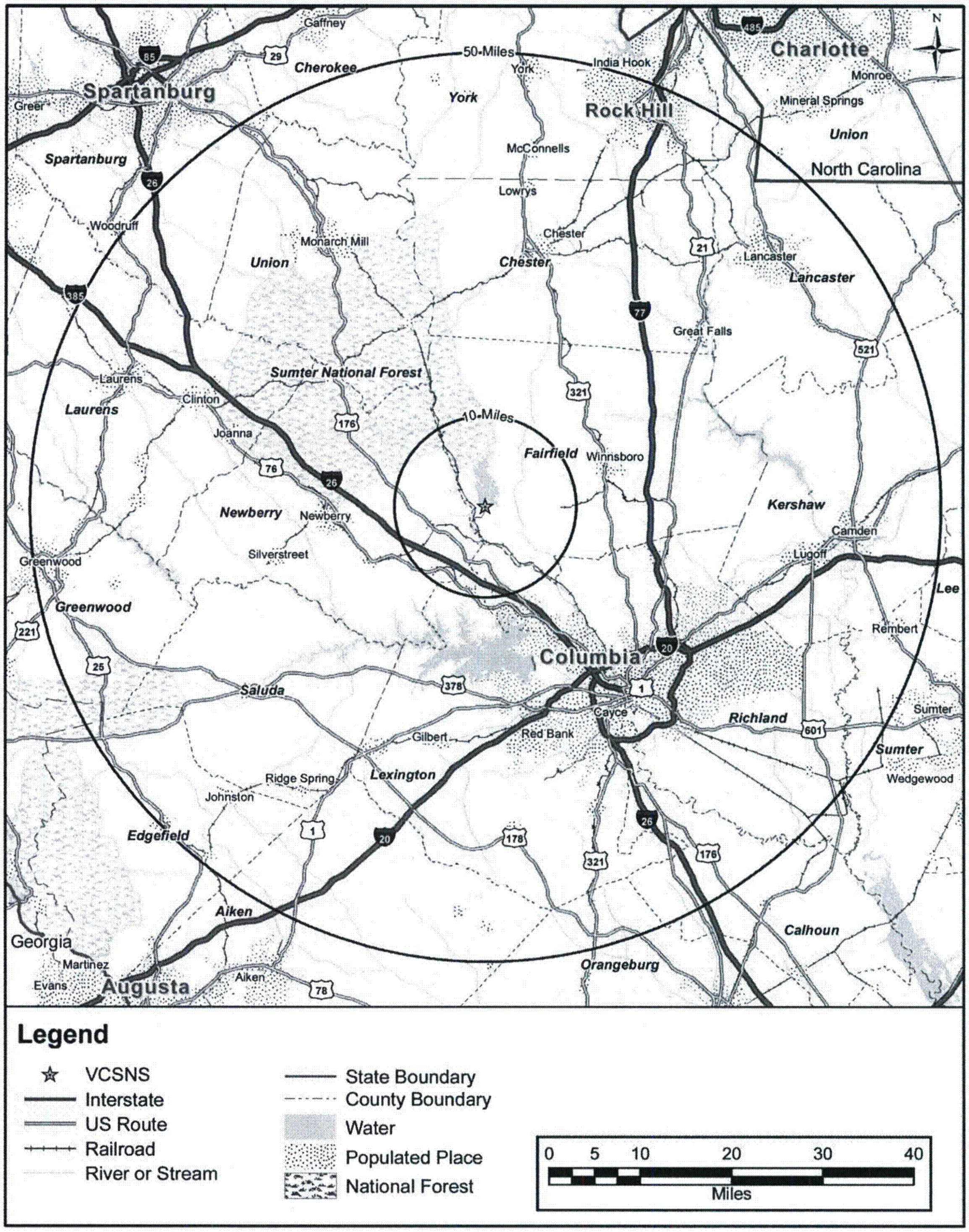


Figure 1-4 50-Mile Emergency Planning Zone (Ingestion Pathway)

Part 2: Planning Standards and Criteria

Section A: Assignment of Responsibility

This section describes the primary responsibilities and organizational control of SCE&G, federal, state, county, and other EROs within the plume exposure pathway and the ingestion pathway zones. Various supporting organizations are also described as well as staffing for initial and continuous response.

1. Concept of Operations

The relationships and the concept of operations for the organizations and agencies that are a part of the overall ERO are as follows:

A. Identified below are federal, state, and county organizations (and other local governmental agencies) that are involved in a response to an emergency at VCSNS (Figure A-1).

1) Federal Agencies: The National Response Framework (NRF) outlines federal statutory and regulatory responsibilities during incidents requiring a coordinated federal response. The primary federal response for supporting an emergency at VCSNS includes:

a) Nuclear Regulatory Commission (NRC): The NRC Regional Office has the responsibility for the auditing of nuclear power stations. It is responsible for ensuring that such activities are conducted in accordance with the terms and conditions of such NRC licenses and that as a result of such operations, there is no undue risk to the health and safety of the public.

The NRC Office of Nuclear Reactor Regulation, established by the Energy Reorganization Act of 1974, as amended, performs licensing functions associated with the construction and operation of nuclear reactors and with the receipt, possession, ownership, and use of special nuclear and byproduct materials used at reactor facilities.

With regard to emergency preparedness, the NRC shall:

- Assess licensee emergency plans for adequacy
- Review the FEMA findings and determinations on the adequacy and capability of implementation of state and local plans
- Make decisions with regard to the overall state of emergency preparedness and issuance of operating licenses

The NRC shall respond to incidents at licensed facilities or vehicular accidents involving licensed materials, in transit. Within the sphere of the NRF, the NRC shall act as a Coordinating Agency. In this role the NRC:

- Performs an independent assessment of the incident and potential offsite consequences and, as appropriate, provides recommendations concerning any protective measures

- Performs oversight of the licensee, to include monitoring, evaluation of protective action recommendations (PARs), advice, assistance, and, as appropriate, direction

- Dispatches, when appropriate, an NRC site team of technical experts to the licensee's facility

Under certain situations involving the protection of public health/safety or national security, the NRC may take possession of special nuclear materials and/or operate certain facilities regulated by the NRC. FEMA shall act as the lead federal agency for offsite, nontechnical concerns.

During an incident, the Chairman of the Commission is the senior NRC authority for all aspects of a response. The Chairman shall transfer control of emergency response activities to the Director of Site Operations when deemed appropriate by the Chairman.

All NRC Regions as well as Headquarters are prepared to respond to potential emergencies. All Regions and Headquarters have developed plans and procedures for responding to radiological incidents involving NRC licensees. Headquarters has developed the NRC Incident Response Plans and Implementing Procedures. Each NRC Region has developed Regional Supplements that detail how the Region will fulfill all of the responsibilities assigned in the NRC Incident Response Plan. All NRC organizations are responsible for maintaining an effective state of preparedness through periodic training, drills, and exercises.

Each Region and Headquarters has established and maintains an Incident Response Center designed to centralize and coordinate the emergency response function. Adequate communications are established to link the licensee, Headquarters, and the Region. The NRC has established lines of communications with local government, state government, other federal agencies, Congress and the White House. Public information will be disseminated in a timely manner and periodically.

Each Region is prepared to send a team of qualified specialists to the scene expeditiously. All of the necessary supplies and equipment needed for emergency response will be provided and maintained by the NRC.

The NRC Incident Response Plan objectives are to provide for protection of the public health and safety, property, and the environment, from the effects of radiological incidents that may occur at licensed facilities or which involve licensed materials, including radionuclides in transit.

The objectives of the agency plan set forth the organizational and management concepts and responsibilities needed to ensure that NRC has an effective emergency response program.

The NRC Incident Response Plan is intended to ensure NRC preparedness:

- To receive and evaluate notification information of incidents, accidents, and unusual events and determine the extent of NRC response necessary to meet NRC responsibilities for mitigating the consequences of these events
- To determine the cause of incidents, accidents, and unusual events in order to ensure that appropriate corrective actions are taken by the licensee to minimize the consequences of these events
- To provide onsite expertise in a timely manner, to evaluate the nature and extent of the incident, ascertain plant status (for reactors and fuel facilities), monitor licensee activities, determine compliance, make recommendations, and, if necessary, issue orders relative to the event
- To inform the public and others of plant status and technical details concerning the incident
- To recommend adequate protective actions to the responsible local and/or state agencies
- To provide technical assistance
- To ensure the plant is returned to a safe condition
- To return the NRC Headquarters and Regional office to normal operations

b) Federal Emergency Management Agency (FEMA): Per the National Response Framework (NRF), FEMA, a division of the Department of Homeland Security (DHS) is responsible for the overall coordination of a multiagency federal response to a significant radiological incident. The primary role of FEMA is to support the state by coordinating the delivery of federal nontechnical assistance. FEMA coordinates state requests for federal assistance, identifying which federal agency can best address specific needs. If deemed necessary by FEMA, it will establish a Homeland Security Operations Center (HSOC) from which it will manage its assistance activities.

c) U.S. Department of Energy (DOE): The DOE has extensive radiological monitoring equipment and personnel resources that it can assemble and dispatch to the scene of a radiological incident. The DOE local operations office at Savannah River Site can assist VCSNS following a radiological incident as outlined in the Federal Radiological Monitoring and Assessment Plan (FRMAP). If VCSNS or the affected states deem that assistance from DOE is necessary or desirable, they will request that assistance using the proper channels. VCSNS will contact the U.S. NRC Headquarters and the affected state(s) will make contact through DHS.

d) Environmental Protection Agency (EPA): Assists with field radiological monitoring/sampling and non-plant related recovery and reentry guidance.

e) Federal Bureau of Investigation (FBI): Support from the FBI is available through its statutory responsibility based in Public Law and the US Code, and through a memorandum of understanding for cooperation with the NRC. Notification to the FBI will be through provisions of the VCSNS Security Plan, or by the NRC.

f) National Weather Service (NWS): Provides meteorological information during emergency situations, if required. Data available will include existing and forecasted wind directions, wind speed, and ambient air temperature.

2) State Agencies

a) The State of South Carolina: The state of South Carolina has the statutory responsibility and authority for protecting the health and safety of the public in South Carolina. The state has developed a "South Carolina Operational Radiological Emergency Response Plan." This plan was developed in accordance with NUREG 0654. The Plan has received 44 CFR 350 unconditional approvals from DHS for all nuclear generating station(s) within the state boundaries. Basic descriptions for the South Carolina state agencies responsible for actions in the event of a nuclear power station are as follows:

- Governor of South Carolina: The governor of the state has overall command authority for both the radiological and nonradiological aspects of a nuclear incident. The governor shall make the final recommendation for protective actions and shall serve as the state's primary spokesperson.

- South Carolina Emergency Management Division (SCEMD): Coordinates the operational response and recovery functions of all state agencies. The SCEMD proposes PARs to the governor. It also coordinates the implementation of the governor's Protective Action Directives (PAD).

  The SCEMD response action to a nuclear incident will fall into one of the following functional areas:

  - Command for all (state-related) radiological aspects of a nuclear incident.
  - Field radiological functions (state-related) of confirmatory accident assessments during a nuclear emergency. This may include a Mobile Command Center, a Mobile Nuclear Laboratory, and monitoring and sampling teams.

  The SCEMD has the responsibility to inform and coordinate technical information with the North Carolina Emergency Management Agencies with respect to an emergency that impacts the 50-mile ingestion pathway zone.

The SCEMD has both the command authority for radiological aspects of a nuclear incident and the responsibility for performing various radiological functions. These functions include milk, water and food control, radiation exposure control for state emergency workers, and confirmatory accident assessment.

- Department of Health and Environmental Control (DHEC): DHEC maintains a radiological hazard assessment capability and provides radiological technical support, coordination and guidance for the state and local governments; conducts and/or coordinates offsite radiological surveillance and monitoring in coordination with the VCSNS offsite environmental monitoring group; and makes recommendations to SCEMD for protective actions as well as recovery and reentry guidelines.

- South Carolina Law Enforcement Division (SLED): SLED provides support during security related events at the station.

- The South Carolina Department of Natural Resources (SCDNR): The SCDNR patrols and ensures the safety of waterways in South Carolina. The SCDNR is promptly notified of any oil or hazardous substance discharges into rivers or lakes or radioactive contamination of rivers or lakes under its jurisdiction at levels requiring assistance to effect protective actions. The SCDNR is contacted by the appropriate state agencies in the event of an incident at an applicable nuclear power plant. The United States Coast Guard (USCG) is responsible for officially closing the waterways to all boating traffic.

b) The State of North Carolina: A portion of the 50-mile ingestion pathway EPZ for VCSNS lies within the state of North Carolina. The state of North Carolina has developed a Radiological Emergency Response Plan to respond to commercial nuclear power stations within the state of North Carolina and for those nuclear stations outside of the state that are within 50 miles of North Carolina.

3) County Government Agencies

VCSNS and the surrounding counties of Fairfield, Newberry, Lexington, and Richland that comprise the plume exposure pathway EPZ have developed integrated emergency response programs that call upon the resources of their county. The county organizations are responsible for implementing and coordinating the county response to an emergency.

Each of the county Emergency Operations Centers (EOCs) serve as the primary coordinating center for local government response within the county's jurisdiction and for coordination between counties.

4) Private Agencies
There are various private agencies that VCSNS has acquired Letters of Agreement regarding support during an emergency. These agencies have agreed to provide firefighting, medical, resource, and lodging support as needed during an emergency. These Letters of Agreement are listed in Appendix 2 and are reviewed and updated as necessary.

B. During an emergency condition classified as an Alert, Site Area Emergency, or General Emergency, the station's augmented ERO is notified and responds to augment the normal plant organization under the direction of the IED.

The augmented ERO consists of three major response suborganizations with inter-relationships as illustrated in Figure A-2:

1) The Onsite ERO, directed by the Emergency Director (ED), provides for:

- Control and operation of the plant
- Mitigation of the emergency condition
- Protection of station personnel inside the Protected Area
- Emergency support for Operations, Engineering, Maintenance, firefighting, Security, and first aid

The onsite ERO is made up primarily of personnel from the station's day-to-day management team, Operations, Health Physics, Chemistry, Engineering, Maintenance, Security, and other site support personnel.

2) The Offsite ERO, directed by the Offsite Emergency Manager (OEM), provides for:

- Offsite radiological accident assessment
- Protection of station personnel outside the Protected Area
- Emergency support for acquisition of material and support personnel
- The primary interface between VCSNS and outside organizations responsible for the protection of the public

The Offsite ERO is made up primarily of personnel from the station's high level management team, Security, Health Physics, and Training with support from other stations departments as necessary.

3) The Emergency Public Information Organization (EPIO), directed by the Emergency Control Officer/Company Spokesperson, coordinates with Public Information Officers (PIO) from other organizations to provide information to the public through the news media.

C. The Emergency Control Officer (ECO) is a senior VCSNS employee with overall responsibility for coordinating emergency response actions of the station, and the EPIO with the affected state(s) and county agencies.

D. Procedures for training and maintenance of the emergency organization are in place to ensure 24-hour-per-day staffing for emergency response, including established communication links.

2. State and County Functions and Responsibilities

The state and counties have emergency response plans that specify the responsibilities and functions for the major agencies, departments, and key individuals of their organizations. This information is located in their respective plans.

3. Agreements in Planning Effort

Written agreements establishing the concept of operations developed between VCSNS and other support organizations having an emergency response role have been developed. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. Agreement letters are not necessary with federal agencies that are legally required to respond based on federal law. However, agreements are necessary if the agency was expected to provide assistance not required by law. Letters of Agreement shall be obtained with private contractors and others who provide services in support of the station during a declared emergency. A list of Letters of Agreement is provided in Appendix 2 of this Plan, the actual letters are maintained on file at the station. Letters of Agreement, as a minimum, state that the cooperating organization will provide their normal services in support of an emergency at the VCSNS site. A contract/purchase order with a private contractor is considered acceptable in lieu of a Letter of Agreement for the specified duration of the contract.

4. Continuous Coverage

VCSNS maintains 24-hour emergency response capability. The normal on-shift complement provides the initial response to an emergency. This group is trained to handle emergency situations (e.g., initiate implementation of the Emergency Plan, make initial accident assessment, emergency classification, notifications, communications, and PARs until the augmented ERO arrives. Personnel from the unaffected unit(s) are available and respond when notified. Minimum staffing will be maintained in the unaffected units in accordance with guidance in NUREG-0654 Table B-1. The ERO is composed of a broad spectrum of personnel with specialties in Operations, Maintenance, Engineering, Radiochemistry, Health Physics, Fire Protection, Security, Public Affairs, and Emergency Preparedness who are available and trained to augment on-shift personnel in an emergency. Procedures for training and maintenance of the emergency organization are in place to provide the capability of continuous (24-hour) operations.

The ED, located in the Technical Support Center (TSC), has the authority and responsibility for assuring continuity of resources (technical, administrative, and material) in the event of the activation of the ERO.

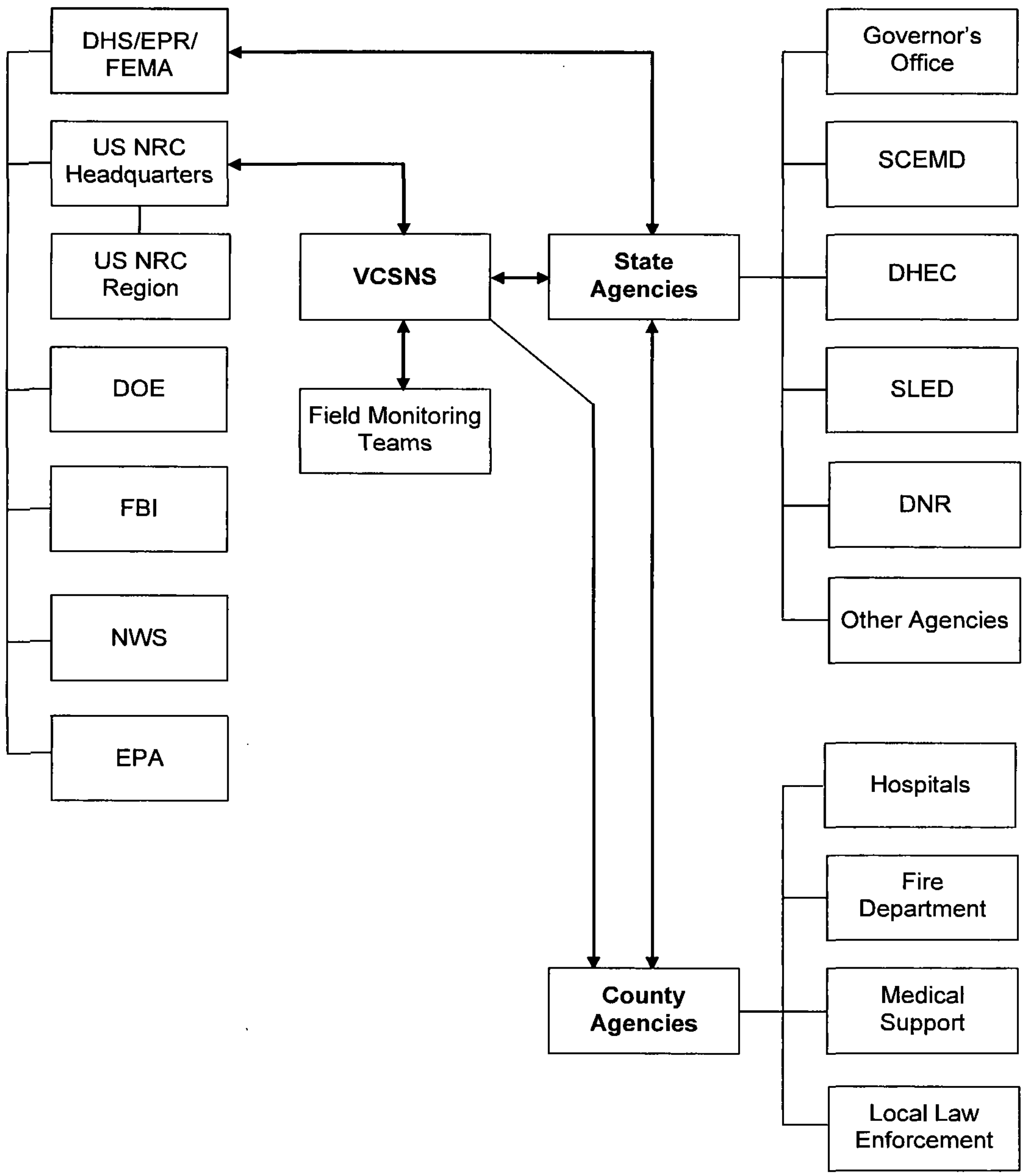


Figure A-1: Agency Response Organization Interrelationships

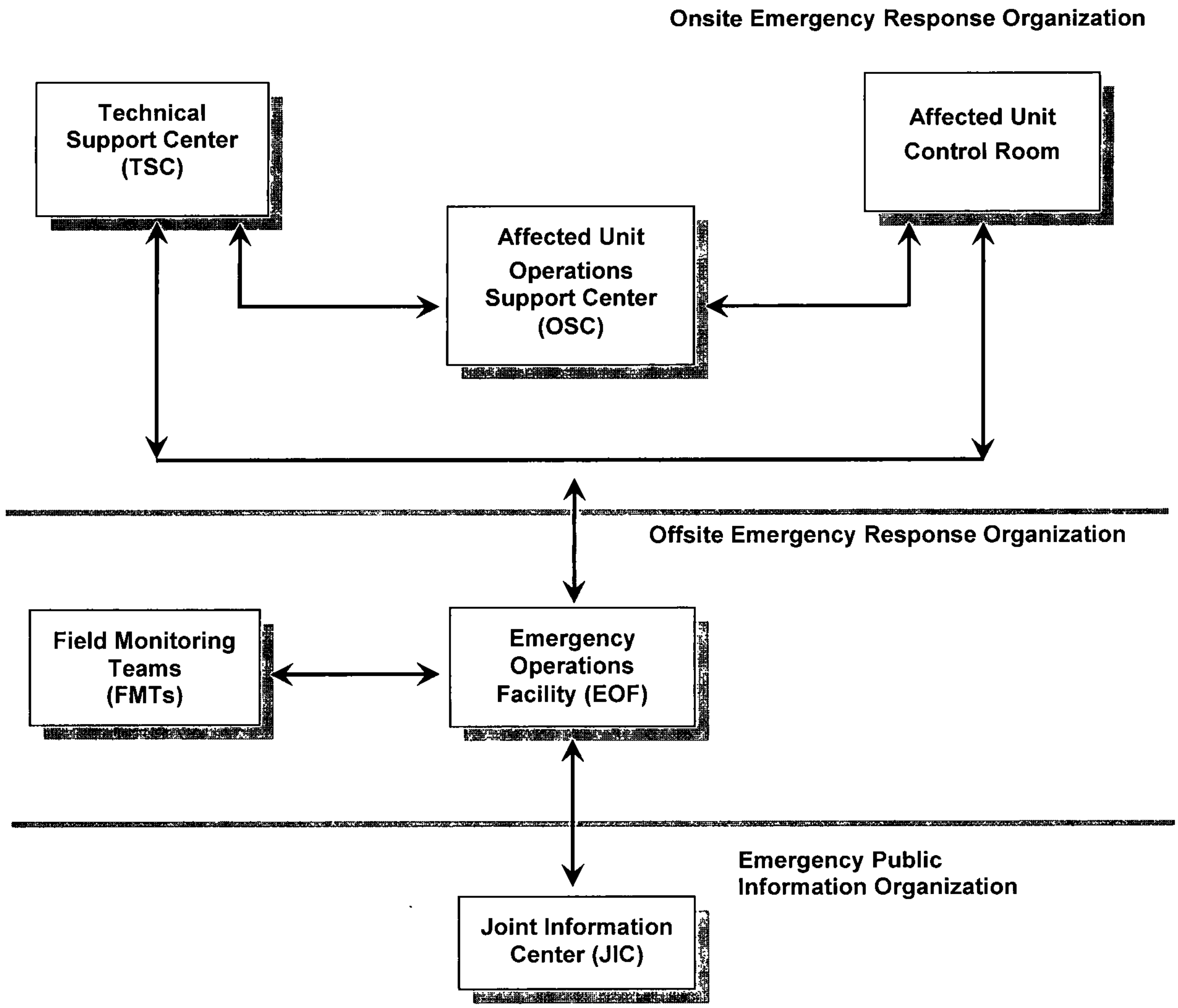


Figure A-2: VCSNS Augmented Emergency Response Organization Interrelationships

Section B: Emergency Response Organization

This section describes the ERO, its key positions, and associated responsibilities. It outlines the staffing requirements that provide initial emergency response actions and provisions for timely augmentation of on-shift personnel when required.

The below-listed ERO positions form the basis of VCSNS emergency response. If needed, any company personnel and resources can and will be used to ensure the safety of offsite populations, station personnel, and protection of station equipment needed to maintain nuclear safety.

1. On-Shift Emergency Response Organization Assignments

The normal plant personnel complement is established with the Vice President, Nuclear Operations having overall authority for station operations. The Vice President, Nuclear Operations directs the unit organization in the management of the various departments while the Shift Supervisor retains the responsibility for actual operation of plant systems. Emergency Preparedness must consider the capabilities of the normal plant organization and the ERO. The initial phases of an emergency situation at VCSNS will most likely involve a relatively small number of individuals. These individuals must be capable of (1) determining that an emergency exists, (2) providing initial classification and assessment, (3) promptly notifying offsite authorities and individuals in the emergency organization, and (4) making PARs as needed. The subsequent phases of the emergency situation may require an increasing augmentation of the emergency organization.

The station has personnel on-shift at all times that can provide an initial response to an Emergency Event. The Unit Annexes' Tables 2-1 outlines the unit on-shift emergency organization and its relation to the normal staff complement. Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing all response actions in an Unusual Event and the initial actions of higher classifications. The full ERO will be activated at an Alert, Site Area Emergency, or General Emergency.

On-Shift Personnel: Shift personnel have the capability at all times to perform detection, mitigation, classification, and notification functions required in the early phases of an emergency. Shift augmentation and further ERO involvement will be determined by the extent and magnitude of the event. When a transition to Severe Accident Management Guidelines (SAMGs) is initiated, the Control Room Staff assumes the duties and responsibilities of the SAMG implementers. A set of guidelines, Beyond Design Basis Mitigation Guidelines (BDMG), in support of events that are beyond VCSNS design basis has been developed and maintained to provide guidance on evaluations and actions taken to mitigate an event of this nature.

Shift Supervisor: Has the responsibility and the authority to declare an emergency and becomes the Interim Emergency Director (IED). In that role, the IED will initiate the appropriate immediate action in accordance with written procedures, mitigate the consequences of the emergency, activate the full ERO at an Alert or higher classification, and notify offsite support and government agencies, as appropriate. In the Shift Supervisor's absence or incapacitation, the line of succession is defined by unit's Operations and Emergency Plan Procedures.

Shift Engineer/Shift Technical Advisor (STA): A qualified individual assumes an overview role as the technical advisor with the specific responsibility of monitoring the maintenance of core cooling and containment integrity. An individual assigned the duty as the Shift Engineer/STA shall be available to the unit Control Room at all times.

Control Room Operators: One qualified Control Room Supervisor and at least two qualified Reactor Operators are assigned to each shift unit during normal operations. They are responsible for operating plant equipment from the Control Room.

Auxiliary Operators: Auxiliary (non-licensed) operators are assigned to each shift. They are responsible for operating plant equipment throughout the plant.

Radiation Protection: The station Health Physics personnel are responsible for the handling and monitoring of radioactive materials. Included in this organization are Health Physics Supervisors and Specialists.

Chemistry: The station Chemistry personnel are responsible for sampling of system effluents, and the chemical and radio-analytical analysis of those samples. Included in this organization are Chemistry Supervisors and Specialists.

Security: The station Security personnel are responsible for the physical security of the site. Included in this organization are Security management and Security Officers.

A Fire Brigade for the Protected Area(s) has been established by designating trained individuals from the above-listed groups as brigade members. The Fire Brigade Leader will be from the Operations staff within the affected Protected Area.

A Medical Emergency Response Team (MERT) for each Protected Area has been established by designating trained individuals from the above listed groups as team members.

An individual (or group of individuals) on each shift is trained and made available to act as the State/County Communicator for each Protected Area. This individual can notify station personnel, state agencies, county agencies, and the NRC. The State/County Communicator will maintain communications as necessary until relieved by members from the augmented ERO.

2. Authority over the Emergency Response Organization

The IED, ED, Offsite Emergency Manager (OEM), and Emergency Control Officer (ECO) are the designated VCSNS individuals who have overall authority and responsibility, management ability, and technical knowledge for coordinating all emergency response activities at the VCSNS. The IED is the Shift Supervisor from the lead unit. In the event that there are multiple units entering in an emergency condition simultaneously, either the Unit 1 or Unit 2 Shift Supervisor, depending on the affected Protected Area, will be the IED. In the event the site as a whole is in an emergency due to natural phenomena, a security event, or an event affecting both Protected Areas, the Unit 1 Shift Supervisor will be designated as the IED. If the event only affects a single Unit, then that Unit's Shift Supervisor is the IED. The ED, OEM, and ECO are members of site management.

Control Room: IED (Shift Supervisor), initially in command and control until relieved by the Emergency Director (ED) in the TSC. Once relieved by the ED, the Shift Supervisor will maintain reactor and systems control.

TSC: ED, when the TSC has attained minimum staffing levels, assumes the responsibilities for classification and declaration of emergencies, evaluations of operational events, and mitigation development. These duties may only be turned over to another qualified ED.

EOF: ECO, when the EOF has attained minimum staffing levels, assumes overall command and control of VCSNS emergency response and approval of press releases, unless a designated Company Spokes Person is assigned. These duties may only be turned over to another qualified ECO/Company Spokesperson.

OEM, when the EOF has attained minimum staffing levels, assumes command and control of the EOF, notification of local, state, and federal agencies, and development and notification of Protective Action Recommendations. These duties may only be turned over to another qualified OEM.

3. Criteria for Assuming Command and Control (Succession)

Emergency personnel assume responsibility for their positions upon receiving notification to activate. The responsibility for initial assessment of, and response to, an emergency rests with the Shift Supervisor. The Shift Supervisor is the IED and has the ED's responsibilities and authority until relieved by a qualified ED. The ED will relieve the Shift Supervisor of the responsibility for continued assessment of the severity of the emergency and functions as part of the ERO as appropriate in accordance with the guidance provided in the Emergency Plan, the Unit Annexes, and the emergency plan procedures. Final succession is achieved when the ED, OEM, and ECO assume overall command and control, and directs VCSNS's emergency response activities.

The Control Room is to be relieved of command and control as soon as possible after the declaration of an Alert or higher classification. The overall command and control of the emergency is transferred directly to the ECO, as soon as possible. Command and control does not transfer to the TSC and EOF until the following criteria have been met:

- Adequate staff levels are present in support of the non-delegable responsibilities.
- The status of the plant is well understood by the relieving individual.
- The staff has been fully briefed as to the status of the event and the current proposed plan of action.
- A formal turnover between the IED relinquishing command and control and the ED, OEM, and ECO assuming command and control has been made.

Although the ERO fulfills all regulatory requirements for emergency response, it may be altered at the discretion of the ECO. This type of alteration will be based on identified needs within the ERO, event dependent criteria, and identified needs of the company as a whole.

4. Non-Delegable Duties

Non-delegable duties include the following functions:

- Event classification
- Development of PARs for the general public
- Notification of offsite authorities (approval of state, county, and NRC notifications)
- Approving company press releases pertaining to the emergency

The Shift Supervisor is responsible for the initial classification of an event and assumes the position as IED. In this capacity, the Shift Supervisor has responsibility for performing the non-delegable responsibilities until relieved.

The ED (in the TSC) will relieve the IED of the command and control and event classification. The OEM (in the EOF) will relieve the IED of emergency notifications and PAR development; and the ECO (in the EOF) will relieve the ED of overall command and control.

5. Emergency Response Organization Position Responsibilities

Each Annexes' Table 2-1 and Part 2 Section B-1 and Table B-1a, outline ERO positions required to meet minimum staffing and augmentation of the on-shift complement upon activation of the Emergency Response Organization (ERO), and the major tasks assigned to each position. The augmentation staffing levels are used as a planning basis to cover a wide range of possible events. For extended events (one that is expected to continue for more than 24 hours), actual staffing will be established by the ED, OEM, and ECO based on the event and personnel availability. However, reduced staffing will only occur after discussion concerning the impact on plant operations and emergency response with the ED, OEM, and ECO.

As shown on Figure B-1a, the overall ERO is made up of three suborganizations:

- The first is called the Onsite ERO. It is responsible for onsite emergency response activities. These activities include protecting plant personnel, mitigating the results of the event, classifications, and keeping the Offsite ERO informed of onsite events and actions being taken.
- The second is called the Offsite ERO, which is responsible for offsite emergency response activities. These activities include providing information to and interface with offsite authorities, monitoring offsite results of the event, protecting plant personnel outside the Protected Area(s), supporting the onsite organization, notifications, Protective Action Recommendations (PAR), and coordinating public information.
- The third is called the Emergency Public Information Organization and is responsible for providing accurate information to the public about the event through the news media.

Specific responsibilities for each suborganization and related positions are as follows:

a. Onsite ERO (Figure B-1b): The Onsite ERO is activated during an emergency classified as an Alert or higher. It can also be activated by the IED at his discretion during an Unusual Event. It functions under the direction of the ED, who is responsible for organizing and coordinating the emergency efforts at and within the Protected Area of the affected unit(s).

The Onsite ERO consists of station personnel who are involved with emergency response efforts necessary to control the plant during an incident. This organization operates out of the Control Room, the Technical Support Center (TSC), and the affected Unit's Operational Support Center (OSC). Collectively, members of the Onsite ERO provide for the following activities during an emergency:

- Plant systems operations and monitoring
- Radiological survey and monitoring (including Environmental Monitoring)
- Firefighting
- Rescue operations and first aid
- Decontamination
- Security of plant and access control
- Repair and damage control
- Personnel protection including assembly, accountability, and evacuation
- Communications

When plant conditions warrant entry into the SAMGs, the ED assumes the role of decision-maker. The Technical Support Supervisor or another qualified individual(s) assumes the role of evaluator and assistant evaluator, and the Control Room staff assumes the role of implementers. Control Room personnel will perform mitigating actions for severe accidents per SAMGs before TSC activation. A set of guidelines, Beyond Design Basis Mitigation Guidelines (BDMG), in support of events that are beyond VCSNS design basis has been developed and maintained to provide guidance on evaluations and actions taken to mitigate an event of this nature.

Those personnel identified to augment the on-shift personnel within 75 minutes of the declaration of an Alert or higher classification are part of the on-call ERO. These personnel are immediately available during normal working hours and are contacted by a call out system during nonworking hours.

For security-related events that would prevent the emergency responders from reaching the site, the augmented TSC, OSC, and Control Room responders would be directed to respond to the EOF or another designated offsite location. TSC/OSC/Control Room staffs will provide any possible assistance from this offsite staging area until such time as site access is restored.

Due to the configuration of the site and the presence of two separate and different technologies, there are selected positions in the ERO that have expertise in a specific technology and will be used as position leads during an emergency affecting that technology.

All Onsite ERO personnel shall have the authority to perform assigned duties in a manner consistent with the objectives of this plan. In addition to maintaining adequate documentation of the event, position responsibilities include:

1) <u>Shift Supervisor (Interim Emergency Director) CR</u>
A Shift Supervisor is on duty 24 hours a day and is the IED in a declared emergency until relieved of this function. While serving in this capacity, the Shift Supervisor is responsible for:

- Activating the ERO (as deemed appropriate or as procedurally required).
- Initiating the NRC Emergency Response Data System (ERDS).
- Performing those duties outlined for the ED, OEM, and ECO.

The on-duty Shift Supervisor directs the activities of the operating crew and is responsible for the safe operation of the plant in compliance with the unit NRC operating license and the unit operating procedures. The Shift Supervisor, after relinquishing command and control, functionally reports to the ED in the TSC.

The Shift Supervisor's responsibilities, when not in command and control, are described below:

- The authority and responsibility to shutdown the reactor when determined that the safety of the reactor is in jeopardy or when operating parameters exceed any of the reactor protection circuit setpoints and automatic shutdown does not occur
- To ensure a review has been completed to determine the circumstance, cause, and limits under which operations can safely proceed before the reactor is returned to power following a trip or an unscheduled or unexplained power reduction
- The responsibility to be present at the plant and to provide direction for returning the reactor to power following a trip or an unscheduled or unexplained power reduction
- The responsibility to adhere to the unit Technical Specifications and to review routine operating data to assure safe operation
- The responsibility to identify applicable EALs and emergency classifications
- The responsibility to adhere to unit operating procedures and the requirements for their use. During an emergency, authorize operations personnel to depart from approved procedures where necessary to prevent injury to personnel, including the public, or damage to the facility consistent with the requirements of 10 CFR 50.54(x) and (y).
- Initiate immediate corrective actions to limit or contain the emergency invoking the provisions of 10 CFR 50.54(x) if appropriate, and specifically when addressing SAMGs or BDMGs
- Approve emergency special procedures, and implement as required under the provisions of 10 CFR 50.54(x)

- Supervise the activities of the Control Room crew and the Communicators
- Initiate onsite protective actions, including authorization of exposure limits for emergency workers in excess of normal station limits

2) Emergency Support Operator CR
The Operator reports to the Shift Supervisor. Major functions include assisting in the determination of the extent of station emergencies and recommending corrective actions. There is one Operator assigned to each Control Room. Each of these individuals report to their respective Control Rooms and communicates with their respective Operations Supervisor(s) in the TSC.

3) Emergency Director (ED) TSC
The ED supervises and directs the Onsite ERO. The ED's responsibilities include organizing and coordinating the onsite emergency efforts. Additionally, the ED has the requisite authority, plant operating experience, and qualifications to implement in-plant recovery operations. The ED is responsible for relieving the IED of classifying emergencies and onsite command and control. EDs are assigned from each Protected Area/Technology (Unit 1 and Units 2 & 3). The ED from affected Unit(s) assumes the position of lead ED for the ERO.

4) Technical Support Supervisor TSC
The Technical Support Supervisor reports to the ED and directs a staff of engineers in performing technical assessments of station emergencies and assists in recovery planning. Supervisors are assigned from each Protected Area/Technology (Unit 1 and Units 2 & 3). The Supervisor from affected Unit(s) assumes the position of lead Supervisor for the ERO.

5) Technical Support Communicator TSC
The Technical Support Communicator reports to the Technical Support Supervisor. The Communicator is responsible for transmitting/receiving technical information or engineering decisions and support requests to and from the EOF, TSC, OSC, and Control Room(s).

6) Operations Supervisor TSC
The Operations Supervisor reports to the ED. Major functions include determining the extent of station emergencies and recommending corrective actions. Supervisors are assigned from each Protected Area/Technology (Unit 1 and Units 2 & 3). The Supervisor from affected Unit(s) assumes the position of lead Supervisor for the ERO.

7) Radiological Assessment Supervisor TSC
The Radiological Assessment Supervisor reports to the ED and supervises the activities of the onsite radiological assessments. The supervisor directs the staff in determining the extent and nature of radiological hazardous and conditions onsite.

8) Emergency Notification System (ENS) Communicator TSC/CR
The Emergency Notification System Communicators report to the ED. The Communicator provides updates and responds to inquiries from the NRC for plant status, emergency classifications, and mitigation assessments, strategies, and actions.

9) Technical Support Staff TSC
Core Thermal (Reactor), Electrical, Mechanical, and I&C (Units 2 & 3 only) Engineers make up the Technical Support Staff. These Engineers evaluate damage assessment reports and support the development of mitigation recommendations, strategies, and procedures to recover the plant and return it to a safe and operational state. Each discipline will provide personnel to support each Protected Area/Technology.

10) Security Manager TSC
The Security Manager reports to the ED and supervises the activities and defensive strategy of the Security Force, the site access control, and the Protected Area and Vital Area access controls. The Manager also provides updates and information to the Security Advisor in the EOF.

11) Chemistry Supervisor TSC
The Supervisor reports to the ED and supervises the activities of the chemistry sampling and analyses. The supervisor directs the staff in determining the extent and nature of radiological and chemistry problems onsite.

12) Maintenance Supervisor TSC
The Supervisor reports to the ED and supervises the activities of the Maintenance organization and assist with mitigation evaluations and repairs. The supervisor directs the staff in determining the extent and nature of mechanical, electrical, and I&C problems. Supervisors are assigned from each Protected Area/Technology (Unit 1 and Units 2 & 3). The Supervisor from affected Unit(s) assumes the position of lead Supervisor for the ERO.

13) Operational Support Center Supervisors OSC
The OSC Supervisors reports to the ED and supervises the activities of OSC personnel while implementing the mitigation strategies and procedures. Each OSC (Units 1, 2, & 3) will have separate Supervisors.

14) Operational Support Center Damage Control Teams OSC
Specialists and Operators make-up the OSC Damage Control Teams. These teams perform emergency mitigation tasks throughout the station. Individuals from Health Physics, Mechanical, Electrical, and I&C Maintenance, Chemistry, and Operations are always available as part of the OSC Damage Control Teams. Individuals from other plant organizations may also be called to assist in emergency mitigation efforts. Each OSC will have separate teams.

b. Offsite ERO (Figure B-1c): The Offsite ERO is activated during an emergency classified as an Alert or higher. It can also be activated by the IED at his discretion during an Unusual Event. It functions under the direction of the Offsite Emergency Manager, and is responsible for offsite emergency response activities. These activities include providing information to, and interface with, offsite authorities; monitoring offsite results of the event; protecting plant personnel outside the Protected Area, who are sheltered or evacuated, supporting the onsite organization, and coordinating the flow of information to the EPIO.

1) Emergency Control Officer (ECO) EOF

When the ECO has command and control, the ongoing responsibilities include:

- Assumes overall command and control of emergency response activities
- Ensure that federal, state, and county authorities and industry support agencies remain cognizant of the status of the emergency situation. If requested, dispatch informed individuals to offsite governmental EOCs
- Serve as the Company Spokesperson for press conferences
- Approve the technical content of VCSNS press releases before they are released to the media (non-delegable duty)
- Coordinate all VCSNS activities involved with the emergency response
- Ensure offsite agency updates are periodically communicated as required/requested
- Request assistance from non-VCSNS emergency response organizations, as necessary
- Provide status, assessment information, and recommended protective actions to offsite emergency response agencies
- Request state or federal assistance

2) Offsite Emergency Manager (OEM) EOF
The OEM reports to the ECO. The OEM has the authority, management ability, and technical knowledge to assist the ECO in the management of VCSNS's offsite ERO by directing and coordinating the activation and response efforts of the EOF staff, determining PARs (non-delegable duty) when necessary, and approving state and county notification forms (non-delegable duty) with the assistance of the Offsite Radiological Monitoring Coordinator and the Communications Coordinator.

3) Plant Engineering Advisor EOF
The Plant Engineering Advisor reports to the OEM. The Advisor supports the OEM and ECO with technical information regarding the affected unit.

4) Offsite Radiological Monitoring Coordinator (ORMC) EOF
The ORMC reports to the OEM and directs the activities of the EOF radiological assessment staff. These duties include specific responsibilities: recommending changes in the event classification and PARs based on effluent releases or dose projections, assisting the OEM in the evaluation of the significance of an emergency with respect to the public, and advising the OEM on the need for emergency exposures or for issuance of Potassium Iodide (KI) to the Field Teams.

5) Dose Assessor EOF
The Dose Assessor reports to the Offsite Radiological Monitoring Coordinator and operates the dose assessment program, interprets radiological data from the field monitoring teams, and provides PARs based on dose projections to the Offsite Radiological Monitoring Coordinator.

6) Communications Coordinator EOF
The Communications Coordinator reports to the OEM and creates the Emergency Notification Form (ENF). The Coordinator ensures initial notifications are communicated to the offsite officials within 15 minutes after the declaration of an emergency classification or change in Protective Action Recommendation (PAR) and follow-up notifications are made within 60 minutes of the previous notification. The position will coordinate the exchange of information with appropriate state and county agencies regarding the emergency, siren activation, offsite Protective Action Decisions (PAD), or other questions that may arise. This position is the lead for the State/County Communicator in the EOF.

7) State/County Communicator EOF
The State/County Communicator reports to the Communications Coordinator and ensures that initial notifications are communicated to the offsite officials within 15 minutes after the change in classification or a change in PARs and that follow-up notifications are made within about 60 minutes of the previous notification. This position will exchange information with appropriate state and county agencies regarding emergency notification forms or other questions that may arise.

8) Plant Security Advisor EOF
The Advisor reports to the OEM and will be responsible for maintaining EOF security, coordinating EOF security with site security, and interfacing with local law enforcement, as needed.

9) Health Physics Network (HPN) Communicator EOF
The Health Physics Network Communicators report to the Offsite Radiological Monitoring Coordinator in the EOF. The EOF communicator provides updates and responds to inquiries from the NRC on offsite environmental data, release status, dose projections, and changes to PARS for the general public.

10) Field Teams EOF
The Field Teams report to the ORMC and are responsible for conducting radiological monitoring surveys and sampling for areas outside of the Owner Controlled Area, within the EPZ.

11) Plant Operations Advisor EOF
The Plant Operations Advisor reports to the OEM. The Advisor supports the OEM and ECO with operational and technical information regarding the affected unit.

c. Emergency Public Information Organization (EPIO) (Figure B-1d): The EPIO is part of the overall ERO that is activated during an emergency. It functions under the ECO (Company Spokesperson) and gets support from the OEM.

The EPIO consists of corporate, and station personnel who are involved with emergency response efforts necessary to coordinate VCSNS public notices with offsite agency public information updates. This organization operates out of the Joint Information Center (JIC). Collectively, members of the EPIO provide for the following activities during an emergency:

- Development and issuance of news releases
- Coordination and conduct of media briefings
- Rumor control
- Media monitoring and correction of misinformation

All EPIO personnel shall have the authority to perform assigned duties in a manner consistent with the objectives of this plan. In addition to maintaining adequate documentation of the event, position responsibilities include:

1) Company Spokesperson (Emergency Control Officer) JIC/EOF
The Company Spokesperson reports is responsible for directing the VCSNS EPIO, coordinating with the other responders, and providing news information to the media.

2) Joint Information Center Coordinator JIC
The JIC Coordinator reports to the Company Spokesperson and is responsible for ensuring the operability of the JIC and supervision of monitoring activities in the JIC.

3) Media Coordinator JIC
The Media Monitoring Coordinator reports to the JIC Coordinator and ensures that the media is being monitored and that VCSNS personnel review the information detailed or contained in media releases.

6. Emergency Response Organization Block Diagram

Each Annex Table 2-1 and Part 2 Section B-1 and Table B-1a, list the basis for the ERO and the supporting positions assigned to interface with federal, state, and county authorities. Section B.5 discusses specific responsibilities and the interrelationships for these positions.

7. Industry/Private Support Organizations

VCSNS retains contractors to provide supporting services. A contract/purchase order with a private contractor is acceptable in lieu of an agreement letter for the specified duration of the contract. Institute of Nuclear Power Organization (INPO), Electric Power Research Institute (EPRI), and Nuclear Energy Institute (NEI) maintain a coordination agreement on emergency information with their member utilities.

Among services currently provided are the following:

a. Institute of Nuclear Power Operations (INPO): Experience has shown that a utility may need resources beyond in-house capabilities for the recovery from a nuclear plant emergency. One of the roles of INPO is to assist affected utilities by quickly applying the resources of the nuclear industry to meet the needs of an emergency. INPO has an emergency response plan that enables it to provide the following emergency support functions:

- Assistance to the affected utility in locating sources of emergency personnel, equipment, and operational analysis
- INPO provides the "Nuclear Network," or its replacement, electronic communications system to its members, participants, NEI, and EPRI to coordinate the flow of media and technical information about the emergency
- VCSNS may obtain utility industry information and assistance from any party to this agreement through the coordination of INPO

To support these functions, INPO maintains the following emergency support capabilities:

- A dedicated emergency call number
- Designated INPO representative(s) who can be quickly dispatched to the VCSNS ERO to coordinate INPO support activities and information flow
- The 24-hour-per-day operation of an Emergency Response Center at INPO headquarters

INPO will be notified (via the designated emergency call number) for all situations involving an Alert, Site Area Emergency, or General Emergency declaration. INPO has coordinated the preparation of a Voluntary Assistance Agreement for Transportation Accidents. SCE&G has signed this agreement which establishes the rights and responsibilities of electric utilities in requesting or providing assistance for response to a transportation accident involving nuclear materials.

b. American Nuclear Insurers (ANI): In early 1982, ANI issued Bulletin #5B (1981) "Accident Notification Procedures for Liability Insured" which provides revised criteria for the notification of the pools in the event of a nuclear emergency at one of the liability insured nuclear power reactor sites. This revision brings the ANI/MAELU (Mutual Atomic Energy Liability Underwriters) notification criteria into alignment with the standard emergency classification system adopted by the nuclear industry. This document also identifies a suitable channel for follow-up communication by ANI after initial notification.

c. DOE Radiation Emergency Assistance Center/Training Site (REAC/TS): DOE REAC/TS provides services of medical and health physics support. REAC/TS advises on the health physics aspects of situations requiring medical assistance.

d. Manufacturer Design and Engineering Support: Under established contracts, the unit(s) design engineering company provides design engineering expertise, specialized equipment, and other services identified as needed and deemed appropriate to assist in an emergency situation.

8. Supplemental Emergency Assistance to the ERO

Agreements are maintained with outside support agencies who do not take part in the organizational control of the emergency. They provide assistance when called on during an emergency or during the recovery phase. These agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. These support agencies (named in Appendix 2) provide services of:

a. Law enforcement

b. Fire protection

c. Ambulance services

d. Medical and hospital support

Support groups providing transportation and treatment of injured station personnel are described in Section L of this Plan.

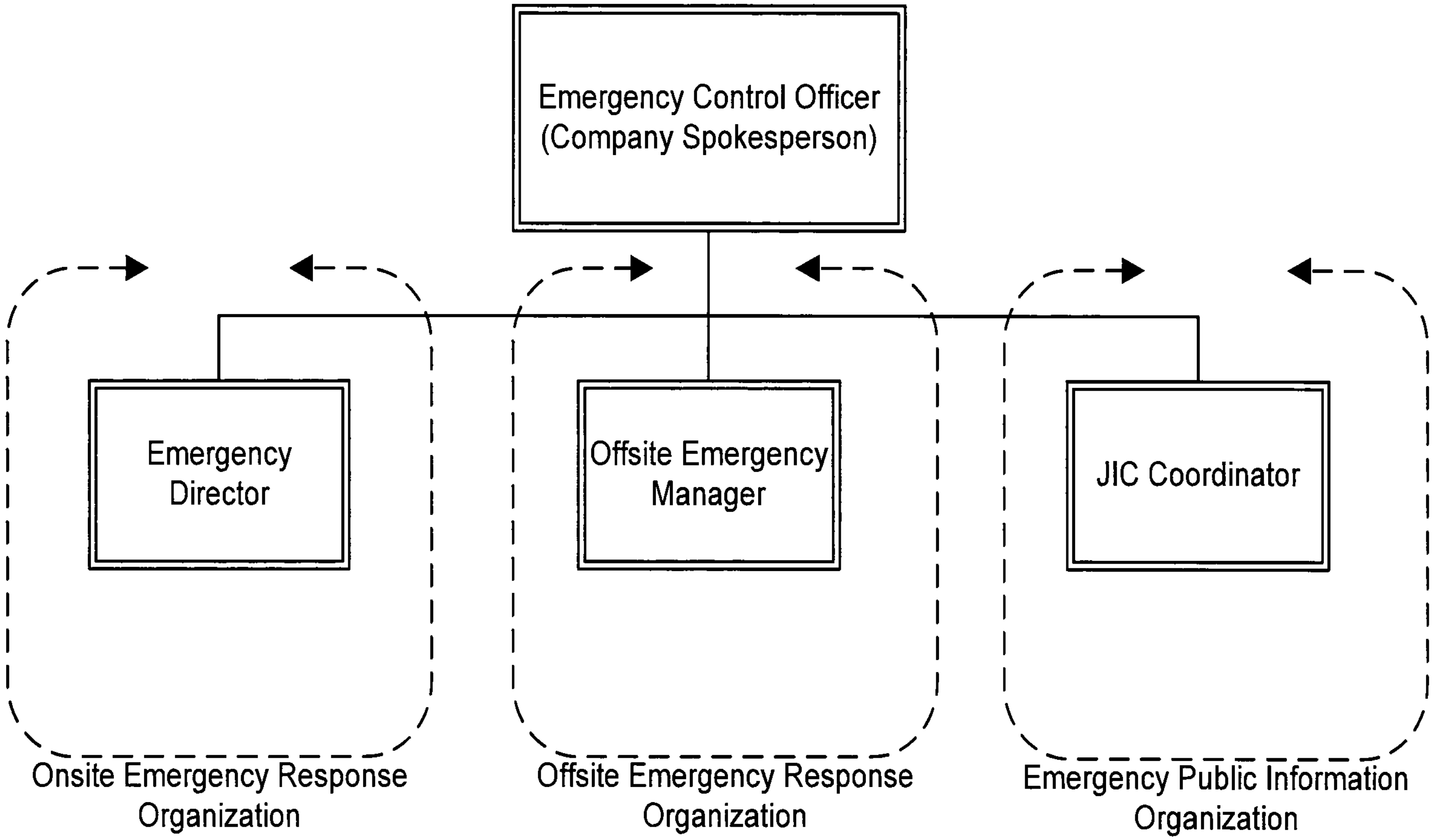


Figure B-1a: Overall ERO Command Structure

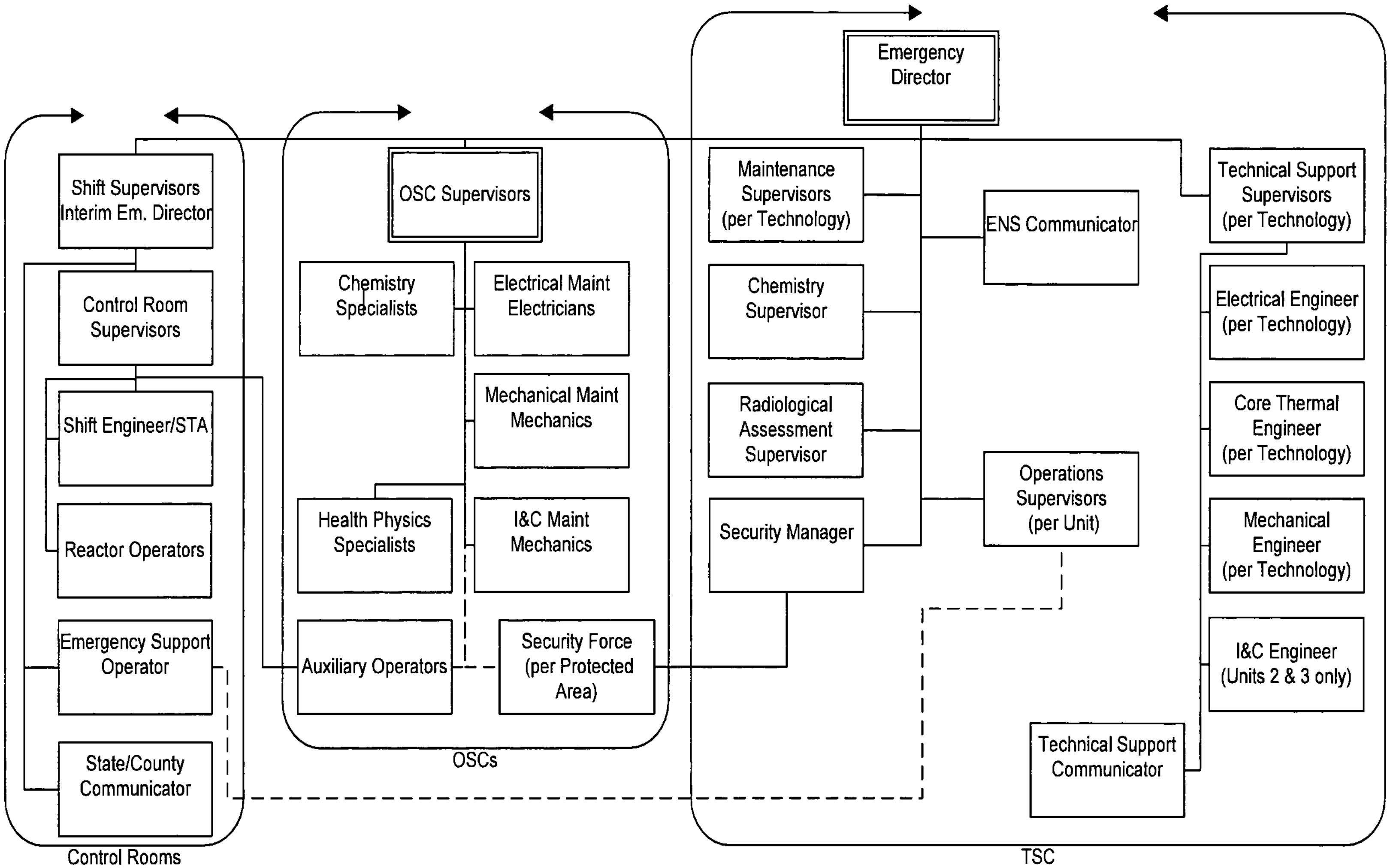


Figure B-1b: Onsite Emergency Response Organization

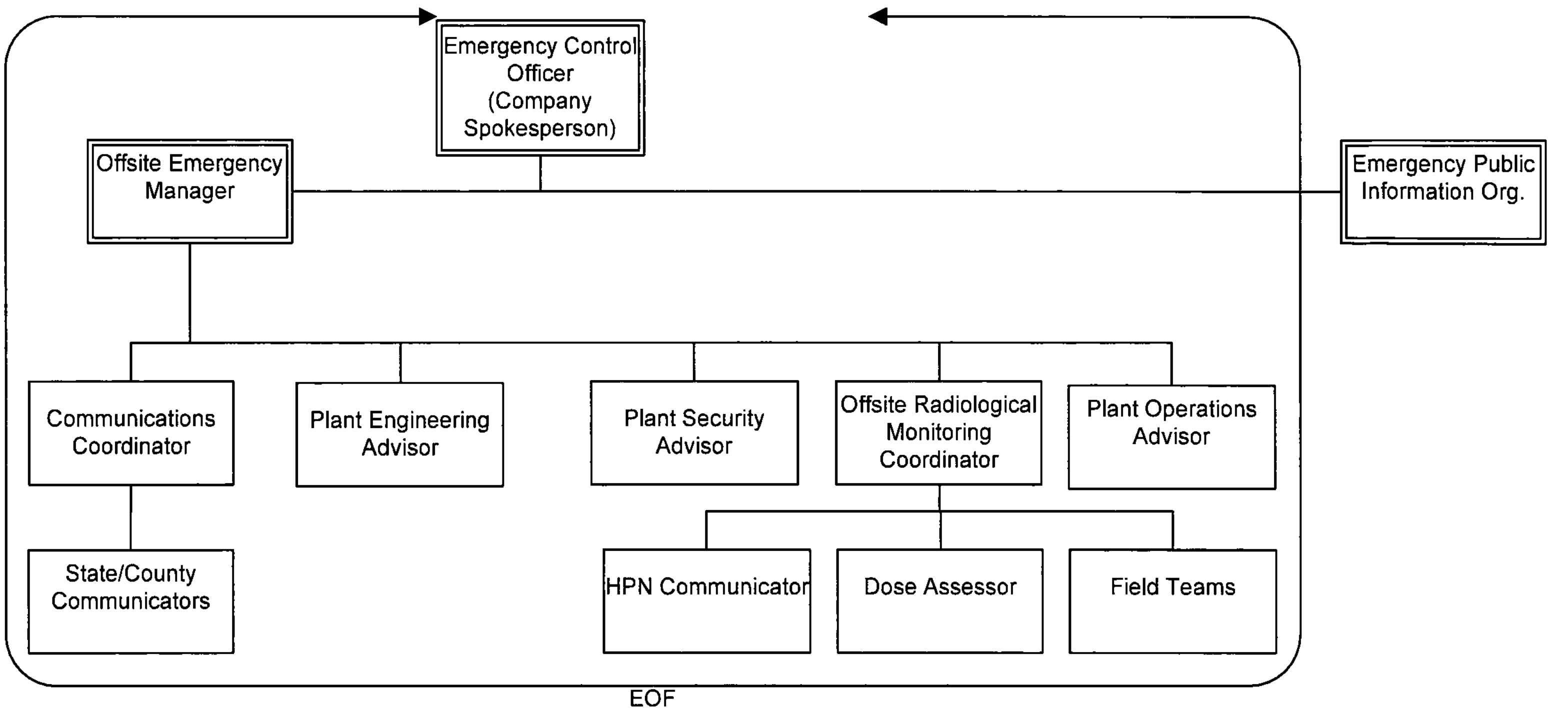


Figure B-1c: Offsite Emergency Response Organization

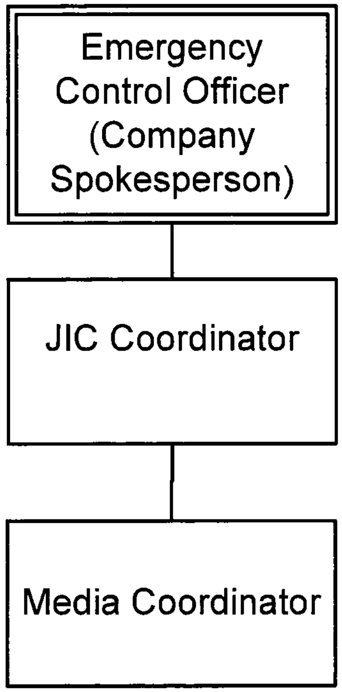


Figure B-1d: Emergency Public Information Organization

Table B-1a: Staffing Requirements for the VCSNS ERO

Functional Area	Major Tasks	Emergency Positions (Facility)		Staffing - Shift/ERO (75 Minute Response Time*)		
				Unit Shift Staffing	ERO Facility Activation Staffing**	ERO Facility Essential Staffing
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor/Interim ED	(CR)	(h)		
		Control Room Supervisor	(CR)	(h)		
		Reactor Operator	(CR)	(h)		
		Auxiliary Operator	(CR/OSC)	(h)		
		Emergency Support Operator	(CR)	----------	----------	1(i)
2. Emergency Direction and Control	Command and Control	Interim Emergency Director	(CR)	(h)		
		Emergency Director	(TSC)	----------	1(a)	
		Emergency Control Officer	(EOF)	----------	1(a)	
		Offsite Emergency Manager	(EOF)	----------	1(a)	
3. Notification & Communication	Emergency Communications	Interim Emergency Director	(CR)	(h)		
		State/County Communicator	(CR)	(h)	----------	
		Offsite Emergency Manager	(EOF)	----------	1(a)	
		State/County Communicator	(EOF)	----------	1(g)	
		Communications Coordinator	(EOF)	----------	1	
	Plant Status	ENS Communicator	(TSC)	----------	----------	1
		Technical Support Communicator	(TSC)	----------	----------	1
		HPN Communicator	(EOF)	----------	----------	1
		Plant Engineering Advisor	(EOF)	----------	----------	1
		Plant Operations Advisor	(EOF)	----------	----------	1

Functional Area	Major Tasks	Emergency Positions (Facility)	Staffing - Shift/ERO (75 Minute Response Time*) Unit Shift Staffing	ERO Facility Activation Staffing**	ERO Facility Essential Staffing
4. Radiological Assessment and Support of Operational Accident Assessment	Offsite Dose Assessment	Health Physics Specialist (OSC)	----------	1	
		Offsite Rad Monitoring Coordinator (EOF)	----------	----------	1
		Dose Assessor/Health Physics (EOF)	(h)	----------	1
	Offsite Radiological Monitoring	Field Monitoring Teams (EOF)			
		Health Physics Specialist (or qualified personnel)	----------	1	1
		Drivers	----------	1	1
	Onsite Radiological Monitoring	Damage Control (OSC)			
		Health Physics Specialist (or qualified personnel)	----------	1	1
		Radiological Assessment Supervisor (TSC)	----------	----------	1
	In-plant Surveys	Health Physics Specialist (OSC)	(h)	----------	1
	Chemistry	Chemistry Specialist (OSC)	(h)	----------	1
		Chemistry Supervisor (TSC)	----------	----------	1
	HP Supervisory	Health Physics Specialist (OSC)	----------	----------	1
5. Plant System Engineering, Repair, and Corrective Actions	Technical Support	Shift Engineer (CR)	(h)		
		Operations Supervisor (TSC)	----------	----------	1(i)
		Technical Support Supervisor (TSC)	----------	1(i)	
		Core Thermal Engineer (TSC)	----------	1(i)	
		Mechanical Engineer (TSC)	----------	----------	1(i)
		Electrical Engineer (TSC)		----------	1(i)
		I&C Engineer (TSC)			1(i)
	Repair and Corrective Actions	Mechanical Maintenance Mechanic (OSC)	(h)	----------	1
		Electrical Maintenance Electrician (OSC)	(h)	1	1
		I&C Maintenance Mechanic (OSC)	(h)	1	1
		Health Physics Specialist (Rad Waste) (OSC)	----------	----------	1
		OSC Supervisor (OSC)	----------	1	
		Maintenance Supervisor (TSC)	----------	----------	1(i)
6. In-Plant Protective Actions	Radiation Protection	Health Physics Specialists (OSC)	(h)	----------	(b)
7. Fire Fighting	—	Fire Brigade	(h) (f)		

Functional Area	Major Tasks	Emergency Positions (Facility)	Staffing - Shift/ERO (75 Minute Response Time*) Unit Shift Staffing	ERO Facility Activation Staffing**	ERO Facility Essential Staffing
8. Rescue Operations and First Aid	—	Medical Emergency Response Team	(h) (f)		
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Force	(h)		
		Security Manager (TSC)	----------	----------	1
		Plant Security Advisor (EOF)	----------	----------	1
10. Public Information	Media Interface, Information Development, Media and Rumor Control Monitoring, and Facility Operations and Control	Company Spokesperson (JIC)	----------	----------	1
		JIC Coordinator (JIC)	----------	----------	1

(a) The Shift Supervisor shall function as the IED until relieved by the Emergency Director and Offsite Emergency Manager

(b) May be provided by personnel assigned other functions

(f) Supported by Offsite Response Organizations (ORO)

(g) Telephone Communicator Only

(h) Shift personnel are listed in each Unit's Annex Table 2-1

(i) Per Unit/Technology (with exception of I&C Eng, Units 2 & 3 only)

* Response time is based on optimum travel conditions

** Facility Activation Staffing also includes Shift Staffing Personnel assigned to the respective facilities. These personnel must be available, but are not required to be in the facility to activate.

Section C: Emergency Response Support and Resources

This section describes the provisions for requesting and effectively using support resources and for accommodating offsite officials at the VCSNS emergency response facilities.

1. Federal Response Support and Resources

Assistance is available from federal agencies through the NRF. The lead federal agency who provides direct assistance to VCSNS during an emergency is the NRC. Other federal agencies, such as the DHS and the DOE provide assistance to the state through implementation of the NRF.

a. Sections A and B of this plan identify the specific individuals by title who are authorized to request federal assistance.

b. Federal agencies that may provide assistance in direct support of VCSNS in the event of an accident are identified in Section A of this plan. If needed, federal resources are made available to VCSNS in an expeditious and timely manner.

c. Each emergency response facility has the equipment and communications capability necessary for a continuous high level of response, interaction, and communication among key personnel during emergency conditions. The emergency facilities are able to accommodate federal representatives with working areas provided for their use. Based on the NRC Response Coordination Manual 1996 (RCM-96) or NUREG-0728, accommodations for the initial site response team assume the following approximate numbers for each facility:

Facility	Accommodations
EOF	12
TSC	6
CR	1
JIC	2

d. Communication pathways provided in each of these facilities include access to dedicated landline telephones, wireless telephones and FTS telephones as provided by the NRC and include the Reactor Safety Counterpart Link (RSCL), Management Counterpart Link (MCL), the Protective Measures Counterpart Link (PMCL), and the Local Area Network (LAN). These FTS lines are available in the appropriate VCSNS emergency response facilities and are for use by the NRC Response Team upon their arrival. The VCSNS ERO does not normally utilize these communication links.

2. Liaisons

a. The NRC and FEMA and the state and counties may dispatch representatives to the EOF where accommodations have been provided.

b. At the Site Area Emergency level and above, VCSNS personnel may be assigned as liaisons to the state of South Carolina, Lexington County, Richland County, Newberry County, and Fairfield County EOCs after they are activated. These representatives act as technical liaisons to interpret emergency action levels, explain accident conditions, and provide technical information regarding actions by the station's ERO.

3. Radiological Laboratories

Support of the radiation monitoring and analysis effort is provided by an onsite laboratory. The onsite laboratory is the central point for receipt and analysis of all onsite samples and includes equipment for chemical analyses and for the analysis of radioactivity.

Additional laboratory facilities are available at DHEC other nuclear facilities, or private labs. DHEC also has a mobile laboratory for analyzing environmental samples. The response time for efficient activation of the mobile laboratory is approximately 2 to 3 hours.

4. Other Assistance

Through INPO, other companies' operating nuclear facilities are available to provide certain types of assistance and support, including technicians, engineering, design, consultation, whole body counting, and dosimetry evaluation and equipment. Additional facilities, organizations, and individuals, as listed in the Emergency Planning Telephone Directory, are available and may be used in support of emergency response. In addition, ANI provides insurance to cover VCSNS legal liability up to the limits imposed by the Price-Anderson Act, for bodily injury and/or property damage caused by the nuclear energy hazard resulting from an incident at the plant. Written agreements that describe the level of assistance and resources provided to VCSNS by external sources listed in Appendix 2 as applicable.

Section D: Emergency Classification System

This section describes the classification and emergency action level scheme used to determine the minimum response to an abnormal event at the station. This scheme is based on plant systems, effluent parameters, and operating procedures for each unit. The initial response of federal, state, and county agencies depends on information provided by the ERO. The station's Emergency Preparedness Staff works closely with the state of South Carolina and county agencies to ensure consistency in classification schemes and procedural interfaces.

1. Emergency Classification System

The Emergency Plan provides for classification of emergencies into four (4) categories or conditions, covering the postulated spectrum of emergency situations. They are:

- Unusual Event
- Alert
- Site Area Emergency
- General Emergency

Each classification is characterized by EALs or event Initiating Conditions (IC) and addresses emergencies of increasing severity.

a. Unusual Event: Events are in progress or have occurred that indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

This is the least severe of the four levels. The purpose of this classification is to bring response personnel and offsite agencies to a state of readiness in the event the situation degrades and to provide systematic handling of information and decision making. The lead Unit's Shift Supervisor will classify an Unusual Event and become the IED.

Required actions at this classification include:

- Notifications to station and company management
- Notification, within 15 minutes, of the state and counties
- At the discretion of the IED, or the station management, full or selective staffing of any one or more of the emergency response facilities may be initiated
- Notification of the NRC as soon as possible but within 60 minutes of classification
- Assessment of the situation and response as necessary, which may include escalating to a higher classification when and if conditions warrant
- When the event is terminated, close-out is performed over communication links to offsite authorities (i.e., NRC, state, county) participating in the response by providing a summary of the event

- Provide a formal written summary transmitted to the state and counties within 24 hours

b. Alert: Events are in progress or have occurred that involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline (PAG) exposure levels.

   The purpose of this classification is to ensure that emergency response personnel are readily available and to provide offsite authorities with current status information. An Alert will be classified as the initiating event or as escalation from an Unusual Event. In either case, the classification will most likely be made by the lead Unit's Shift Supervisor (IED) before the transfer of command and control.

   Required actions at this classification include:

   - Notifications to station management
   - Notification, within 15 minutes, of the state and counties
   - Activation of the TSC, OSC(s), EOF, and JIC
   - Transfer of command and control
   - Notification of the NRC as soon as possible but within 60 minutes of classification
   - Notification of INPO and ANI
   - Assessment of the situation and response as necessary, which may include escalating to a higher classification if and when conditions warrant
   - Onsite and offsite field teams are sent to staging areas or dispatched to monitor for releases of radiation to the environment
   - Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological and radiological data
   - When the event is terminated, close-out is performed over communication links to offsite authorities participating in the response by providing a verbal summary of the event (i.e., NRC, state, county), followed by formal written summary transmitted to the state and counties within 8 hours.

c. Site Area Emergency: Events are in progress or have occurred that involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTIONS that result in intentional damage or malicious acts 1) toward site personnel or equipment that could lead to the likely failure of, or 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

   This classification will most likely be made by the ED following activation of the TSC with notifications being developed in the EOF.

Required actions at this classification, in addition to those listed under the Alert level, include:

- If not previously performed, assembly/accountability shall be performed and site evacuation of nonessential personnel shall be initiated.

- Dispatch of plant technical liaisons to the county and state EOCs when they are activated to provide a plant-knowledgeable individual to explain plant communications regarding the emergency and support the interaction with the offsite authorities during the emergency

d. General Emergency: Events are in progress or have occurred that involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

The purpose of this classification, in addition to those of the Site Area Emergency level, is to initiate predetermined protective actions for the public and provide continuous assessment of information from monitoring groups. The classification will most likely be made by the ED following activation of the TSC with notifications and PARs being developed in the EOF, following activation.

Required actions at this classification, in addition to those listed under the Alert and Site Area Emergency, include:

- A PAR will be determined and issued.

- Assessment of the situation and response as necessary.

e. Classification Downgrading: VCSNS's policy is that emergency classifications shall not be downgraded to a lower classification. Once declared, the event shall remain in effect until no classification is warranted or until such time as conditions warrant entry into the Recovery Phase.

f. Guidance for Termination of an Emergency: The purpose of terminating an emergency is to provide an orderly turnover of plant control from the EROs to the normal VCSNS plant organization. Termination of the emergency is authorized by the ECO in command and control. If the emergency is classified as an Alert or higher, the IED must await the activation of the emergency response facilities and turn over command and control to the ECO before initiating the Recovery/Termination Checklist. The considerations provided in the Recovery/Termination Checklist in the emergency plan procedures must be performed before exiting the emergency event. Consultation with governmental agencies and other parties should be conducted before termination of an event classified as Site Area Emergency or General Emergency. Notifications shall be transmitted to appropriate agencies to terminate an event. When a classified event is terminated a Recovery Phase will be entered.

g. Recovery Phase: That period when the emergency phase is over and activities are being taken to return the situation to a normal state (acceptable condition). The plant is under control and no potential for further degradation to the plant or the environment is believed to exist.

Entry into the Recovery Phase will be authorized by the ECO after consultation with the ED and OEM at an Alert or higher classification and the offsite authorities if a Site Area Emergency or General Emergency was declared. The IED may enter the Recovery/Termination Phase after the Unusual Event when conditions warrant.

Required actions at this phase include:

- The state and the NRC shall be consulted prior to entry into recovery from a Site Area Emergency or a General Emergency.
- Notifications will be made to station management, state, counties, and NRC.
- A Recovery organization will be established to manage repairs to return the Unit(s) to an acceptable condition, and support environmental monitoring activities as requested in coordination with federal and state efforts.
- INPO and ANI are notified of Recovery classification.

h. VCSNS Security Plan: VCSNS has a Security Plan that complies with the requirements of 10 CFR 73. The interface between the Radiological Emergency Plan and the Security Plan is one of parallel operation. The plans are compatible. The Radiation Emergency Plan response measures, once initiated, are executed in parallel with measures taken in accordance with the Security Plan. During a classified event, the individual in overall command and control has responsibility for implementing both plans.

Threats made to VCSNS facilities are evaluated in accordance with established threat assessment procedures and the Security Plan. The Security Plan, Appendix C, Safeguards Contingency Plan, identifies situations that could be ICs for EAL classifications. Contingency events include bomb threats, attack threats, civil disturbances, Protected Area intrusions, loss of guard/post contact, vital area intrusions, bomb devices discovered, loss of guard force, hostages, extortion, fire/explosions, internal disturbances, security communications failure, and obvious attempts of tampering. The Safeguards Contingency Plan provides guidance for decisions and actions to be taken for each security contingency event. As guidance, the Safeguards Contingency Plan allows for differing responses depending upon the assessment of the actual situation within each contingency event classification.

The assessment of any security contingency event and the decision to initiate, or not to implement the Radiation Emergency Plan, will be the responsibility of the Shift Supervisor or ECO. All identified security contingency events have the potential of being assessed as ICs for a radiological emergency declaration.

2. Emergency Action Level Technical Basis

Emergency Plan Implementing Procedures include an EAL Technical Basis Document which includes Unit-Specific EALs consistent with the emergency classification descriptions from NEI 99-01 and NEI 07-01. The EALs are consistent with NEI guidance documentation in accordance with Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors." Where possible, these EALs will be related to plant instrumentation readings.

Emergency classifications are characterized by EALs. The Threshold Values are referenced whenever an Initiating Condition is reached. An Initiating Condition is one of a predetermined subset of unit conditions where either the potential exists for a radiological emergency, or such an emergency has occurred. Defined in this manner, an Initiating Condition is an emergency condition, which sets it apart from the broad class of conditions that may or may not have the potential to escalate into a radiological emergency. ICs are arranged in one of the Recognition Categories.

EALs are for unplanned events. A planned evolution involves preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls before knowingly entering the condition. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL Threshold Value being met or exceeded are not subject to classification and activation requirements as long as the evolution proceeds as planned. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72.

An emergency is classified after assessing abnormal plant conditions and comparing them to EAL Threshold Values for the appropriate ICs. Classifications are based on the evaluation of VCSNS. EAL matrix tables organized by recognition categories are used to facilitate the comparison. The EAL matrix for Unit 1 is used when the unit is in the Technical Specification defined modes of Power Operations as: Power Operations, Startup, Hot Standby, Hot Shutdown, Cold Shutdown, Refueling, or the Defueled mode. The EAL matrix for Units 2 & 3 is used when either unit is in the Technical Specification defined modes of Power Operations as: Power Operations, Startup, Hot Standby, Safe Shutdown, Cold Shutdown, Refueling, or Defueled.

All recognition categories should be reviewed for applicability prior to classification. The EALs are coded with a letter and number designator. All ICs, which describe the severity of a common condition (series), are located above the EALs.

3. Offsite Classification Systems

VCSNS works with the state and counties to ensure consistency between classification schemes. The content of the EALs is reviewed with the state and county authorities on an annual basis. The state and counties are informed regarding any EAL changes that significantly impact the ICs or technical basis.

4. Offsite Emergency Procedures

VCSNS works with the state and county authorities to ensure that procedures are in place that provide for emergency actions to be taken which are consistent with the protective actions recommended by the station, accounting for local offsite conditions that exist at the time of the emergency.

Section E: Notification Methods and Procedures

This section describes the notification of state and county response organizations, federal agencies, and VCSNS emergency response personnel. It outlines the content of initial and follow-up messages to response organizations within the plume exposure pathway EPZ.

1. Bases for Emergency Response Organization Notification

VCSNS, in cooperation with state and county authorities, has established mutually agreeable methods and procedures for notification of offsite response organizations consistent with the emergency classification and action level scheme. Notifications to offsite agencies include a means of verification or authentication such as the use of dedicated communications networks, verification code words, or providing call-back verification phone numbers.

Notification for Transportation Accidents: A Transportation Accident is defined in 49 CFR 171.15 and 49 CFR 171.16. If a Transportation Accident involving material in the custody of a VCSNS facility occurs, the appropriate internal and offsite agencies will be notified in accordance with VCSNS procedures.

2. Notification and Mobilization of Emergency Response Personnel

Emergency implementing procedures are established for notification and mobilization of emergency response personnel as follows:

a. Onsite: When an emergency is declared, reclassified, or terminated, an announcement is made (over the plant public address system or by other means) that includes the emergency classification declared and response actions to be taken by site personnel.

   At the Unusual Event classification, select ERO augmentation personnel may be notified and requested to remain available to respond. At an Alert classification or higher, ERO augmentation personnel are notified for activation of the TSC, OSC, EOF, and JIC using an ERO notification system and/or manual call-outs via commercial telephone as backup.

b. Offsite: Notifications are promptly made to offsite EROs as follows:

   1) State/County Agencies: A notification shall be made within 15 minutes of:

      - The initial emergency classification
      - Classification escalation
      - The issuance of, or change to a PAR for the general public
      - Changes in radiological release status, occurring outside of an event classification or PAR notification, based on an agreement with the state/county authorities

      The emergency warning points are simultaneously notified using a dedicated notification system. Commercial telephone lines and/or radios are available as backup notification methods.

A notification will also be initiated to cognizant state/county government agencies as soon as possible but within one hour of the termination of an event classification, or entry into Recovery Phase.

2) NRC: An event will be reported to the NRC Operations Center immediately after notification of the appropriate state and county agencies but not later than one hour after the time of initial classification, escalation, termination, or entry into the Recovery Phase. The NRC is notified by a dedicated telephone system called the Emergency Notification System (ENS). If the ENS is inoperative, the required notifications are made via commercial telephone service, other dedicated telephone service, or any other method that shall ensure that a report is made as soon as practical. The Emergency Notification Form (ENF) should be used as a guide to provide initial information to the NRC. If continuous communication is requested and established, a log is used in lieu of the ENF.

Specific requirements for the notifications to the NRC for classified emergency events are detailed in 10 CFR 50.72 with guidance provided in the station's notification procedures.

The computerized data link to the NRC, referred to as the ERDS, will be initiated within one hour of the declaration of an Alert classification or higher.

Mobilization of federal, state, and county response organizations is performed in accordance with their applicable emergency plan and procedures. At a minimum, mobilization of federal response organizations and activation of state and county EOCs is expected to occur at the declaration of a Site Area Emergency. The state and county authorities are responsible for the process of notification of the general public.

c. Support Organizations: When an emergency is initially classified, escalated, or terminated, notifications are promptly made to the following support organizations:

- Medical, rescue, and firefighting support services are notified for assistance as the situation dictates
- INPO is notified at an Alert or higher classification with requests for assistance as necessary
- ANI is notified at an Alert or higher classification with requests for assistance as necessary
- Vendor and contractor support services are notified for assistance as the situation dictates

3. Initial Notification Messages

VCSNS, in conjunction with state and county authorities, has established the contents of the initial notification message form, the ENF, transmitted during a classified emergency. The contents of the form include, as a minimum:

- Designation ("Drill" or "Actual Event")

- Identity of site and unit
- Event classification
- EAL number (as agreed upon with state authorities)
- Nontechnical event description (as agreed upon with state authorities)
- Date and time of declaration (or entry into Recovery Phase or Termination)
- Whether a release is taking or has taken place (Note: "Release" means a radiological release attributable to the emergency event.)
- Wind direction and speed
- Whether offsite protective measures may be necessary
- Potentially affected EPZ zones when a General Emergency is declared

Notification approval, transmittal date and time, and offsite agencies contacted are recorded either on the notification form or in an event logbook.

4. Follow-Up Messages

For all emergency classifications, update messages to state and county authorities will be provided on a prearranged frequency. The facility in control of notifications is responsible for ensuring that the updates are completed. State and county updates contain the prearranged information plus any additional information requested at the time of the notification.

Follow-up notifications are provided to the NRC Operations Center as soon as possible, but not later than one hour after significant new information is available involving:

a. The results of evaluations or assessments of plant conditions.

b. The effectiveness of response or protective measures taken.

c. Information related to plant behavior that is not understood.

If requested by the NRC, an open, continuous communications channel will be maintained with the NRC Operations Center over the ENS and/or HPN circuits.

5. State and County Information Dissemination

The state and county emergency response plans describe procedures for state and county officials to make a public notification decision promptly on being informed by the plant of an emergency. The system for disseminating information to the public includes notification by pre-scripted messages through appropriate broadcast media such as the Emergency Alert System (EAS).

6. Notification of the Public

The capability for the prompt notification of the general public within the 10-mile plume exposure pathway EPZ around the VCSNS is covered under this plan.

This notification capability consists of two principal elements: (1) the Alert and Notification Systems (ANS) and (2) the EAS radio or television stations.

- The ANS consists of fixed sirens. Activation of the ANS sirens when directed by the civil authorities will alert the public to turn on their radios or televisions to a local EAS station for detailed information on the emergency situation.
- The EAS is a network of local radio and television stations prepared to transmit or relay emergency information and instructions from the civil authorities to the general public. This notification is directed and controlled by civil authorities, not VCSNS

Activation of the ANS will be initiated by VCSNS personnel upon direction by state or local authorities as specified in existing agreements concerning activation of the system. The siren system is designed in such a fashion that it can be operationally segregated by county boundary within the 10-mile emergency zone radius. The ANS signal will be a three-minute steady signal. Upon determination of the need for public notification, the ANS can be activated within 15 minutes. Upon failure of part or all of the system, the State of SC will direct notification methods in accordance with their plan.

The locations of the sirens were determined by a comprehensive engineering study that addressed population density, geographical features, siren output, and mounting heights of sirens, to ensure coverage of the EPZ.

To ensure the ANS is maintained in an operational readiness posture, the local agencies have agreed to a testing frequency for the system (by sounding the sirens) periodically that meets or exceeds FEMA guidance. Reports of inoperable equipment are provided to EP-designated maintenance personnel. The goal of the testing and maintenance program is to identify inoperable equipment in a timely manner and to restore equipment to a functional status commensurate with FEMA operability requirements as referenced in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants" Section E.6.2.1. In addition to this routine test and repair program, preventive maintenance of the ANS will be performed on an annual basis.

7. Messages to the Public

The state has developed EAS messages for the public consistent with the classification scheme. These draft messages are included as part of the South Carolina Operational Radiological Emergency Response Plan and contain instructions with regard to specific protective actions to be taken by occupants and visitors of affected areas. Messages may include instructions such as: take shelter and go indoors, close windows and doors, turn off ventilation systems; directions given for evacuation; directions to stay tuned to specific stations for further information, ad hoc respiratory protection, (e.g., handkerchief over mouth, etc.). VCSNS will provide support for the content of these messages when requested. The state and/or the counties control the distribution of radio protective drugs to the general public.

Section F: Emergency Communications

This section describes the provisions used for prompt communications among principal EROs, communications with the ERO, and communications with the general public.

1. Communications/Notifications

SCE&G has extensive and reliable communication systems installed at VCSNS. Examples of the communications network include systems such as normal and dedicated telephone lines on landlines, fiber-optic voice channels, cell phones, satellite phones, mobile radio units, portable radios, and computer peripherals. This network provides:

- Voice communication through normal telephone, dedicated line, and automatic ring-down between selected facilities, conference call capability, speaker phones, and operator assistance where required. In addition, there are satellite phone and cell phone capabilities to maintain communication links to the emergency response facilities and offsite authorities.

- Communications between emergency vehicles and appropriate fixed locations, as well as with state mobile units and fixed locations

- Facsimile, computer network, and modem transmission

Figure F-1 depicts the initial notification paths and the organizational titles from the VCSNS Emergency Response Facilities (ERFs) to federal, state, and county EROs, and industry support agencies. The primary and alternate methods of communication, and the NRC communications network, are illustrated on Figures F-2 and F-3.

a. VCSNS maintains the capability to make initial notifications to the designated offsite agencies on a 24-hour-per-day basis. The offsite notification system, referred to as the Electric Switch System Exchange (ESSX), provides communications to state and county warning points and EOCs from the Control Room, TSC, and the EOF. Backup methods include facsimile, commercial telephone lines, radios, and internet. State and county warning points are continuously staffed.

b-d. VCSNS has established several communication systems that ensure reliable and timely exchange of information necessary to provide effective command and control over any emergency response (1) between the station and state and county agencies within the EPZs, (2) with federal EROs, (3) between the station, the EOF, and the state and county EOCs, and (4) between ERFs and Field Monitoring Teams. A general description of the systems is as follows:

1) Private Branch Exchange (PBX) Telephone System: The PBX telephone system provides communication capability between telephones located within the VCSNS facilities through direct dialing. The PBX is used to connect the Control Room, TSC, OSC, and the EOF. The PBX telephone system also provides for outside communications through interconnections with the corporate fiber optic telephone communications system and commercial telephone systems.

2) ESSX: The ESSX is a dedicated commercial communications system that has been installed for the purpose of notifying state and county authorities of declared

emergencies at VCSNS. This system links together the VCSNS Control Room, EOF, TSC, and state and county authorities as appropriate.

3) Local Commercial Telephone System: This system provides standard commercial telephone service through the public infrastructure, consisting of central offices and the wire line carrier. The commercial telephone system includes connections to PBX, emergency telephone system, dedicated lines to emergency facilities, and lines to the JIC. The commercial vendor provides primary and secondary power for their lines at their central office.

4) ERDS: As prescribed by 10 CFR 50 Appendix E.VI, ERDS will supply the NRC with selected plant data points on a near real time basis. ERDS is activated by the ERO as soon as possible but not later than one hour after declaration of an Alert, Site Area Emergency, or General Emergency. The selected data points are transmitted via modem or a Virtual Private Network (VPN) to the NRC at approximately 1-minute intervals. The ERO has backup methods available to provide required information to the NRC in the event that ERDS is inoperable during the declared emergency.

5) Field Monitoring Team Communications: A separate radio communications channel has been installed to allow coordinated environmental monitoring and assessment during an emergency. This system consists of the necessary hardware to allow radio communication between the Control Room, EOF, and mobile units in VCSNS vehicles. Commercial cell phones, satellite phones, or other means are available as backup to the primary field team communications system.

6) Satellite Telephones: Satellite telephones are provided to the Control Room, the TSC, and the EOF providing a backup communication link in the event that the landlines are rendered inoperative. These units are equipped with outside antennae to permit the use of the communications device inside the facilities.

7) 800 MHz Radio: This radio system is an 800 MHz SCANA Corporation system that is divided into trunks which are used by corporation subsidiaries. The trunk system at VCSNS is comprised of channels for Maintenance, Operations, Health Physics, Field Monitoring Teams, etc to allow a means of communications between facility personnel and field personnel for routine work and emergency conditions. The system utilizes both base stations and remote units in conjunction with associated cabling, repeaters, and antennas to provide optimum coverage for two-way continuous transmission.

8) SCE&G Fiber Optic System: The fiber optic system connects South Carolina Electric and Gas Company's main office in Cayce, South Carolina with the Summer Complex which includes V.C. Summer Nuclear Station, Fairfield Pump Storage Unit, Parr Steam and Hydro Unit and the New Nuclear Deployment Building. Summer Station is the hub for this system. The system contains 72 fiber optic channels.

9) In addition, station communication links exist to ensure appropriate information transfer capabilities during an emergency. The station may also use its video conferencing systems, computer network connections, wireless telephones, or station radios to augment its emergency communications.

e. ERO Notification System: VCSNS uses an automated ERO Notification System that employs an automatic telephone system to rapidly notify members of the ERO. Procedures specify the course of action to be taken if the ERO Notification System fails.

f. NRC Communications (ENS and HPN): Communications with the NRC Operations Center will be performed via the NRC ENS and the HPN circuits or commercial and satellite telephone lines. Information is normally communicated to the NRC in accordance with NL-122, Regulatory Notification and Reporting, before establishing an open ENS and/or HPN line.

Installation and use of these NRC telephones is under the direction of the NRC (see Figure F-3).

Emergency Notification System: Dedicated telephone equipment is in place between the Control Room and the NRC, with an extension of that line in the TSC. A separate line is available in the EOF with the capability of being patched with the station through the NRC. This line is used for NRC event notifications and status updates. Backup power is provided for these lines.

HPN: There also exists a separate dedicated telephone between the NRC and the EOF for conveying health physics information to the NRC as requested or as an open communication line. Backup power is provided for these lines.

2. Medical Communications

Communications are established with the primary medical hospitals and transportation services via commercial telephone that is accessed by VCSNS personnel.

3. Communications Testing

Communications equipment is checked in accordance with Section N.2. Communication drills between VCSNS and state and county government facilities are conducted in accordance with Section N.2.a.

ANS siren testing is performed as follows:

Silent Test .... At least biweekly

Growl (or Equipment) Test .... Quarterly and following preventive maintenance

Full Volume Test .... Annually

4. Plant Alarms

In conjunction with the plant paging systems, the site has audible alarms used to alert site personnel to an unsafe or emergency conditions. The alarms include a Reactor Building/Containment Vessel Evacuation Alarm, Radiation Emergency/Site Evacuation Alarm, and Fire Alarm. Activation of these alarms is done from the Control Rooms.

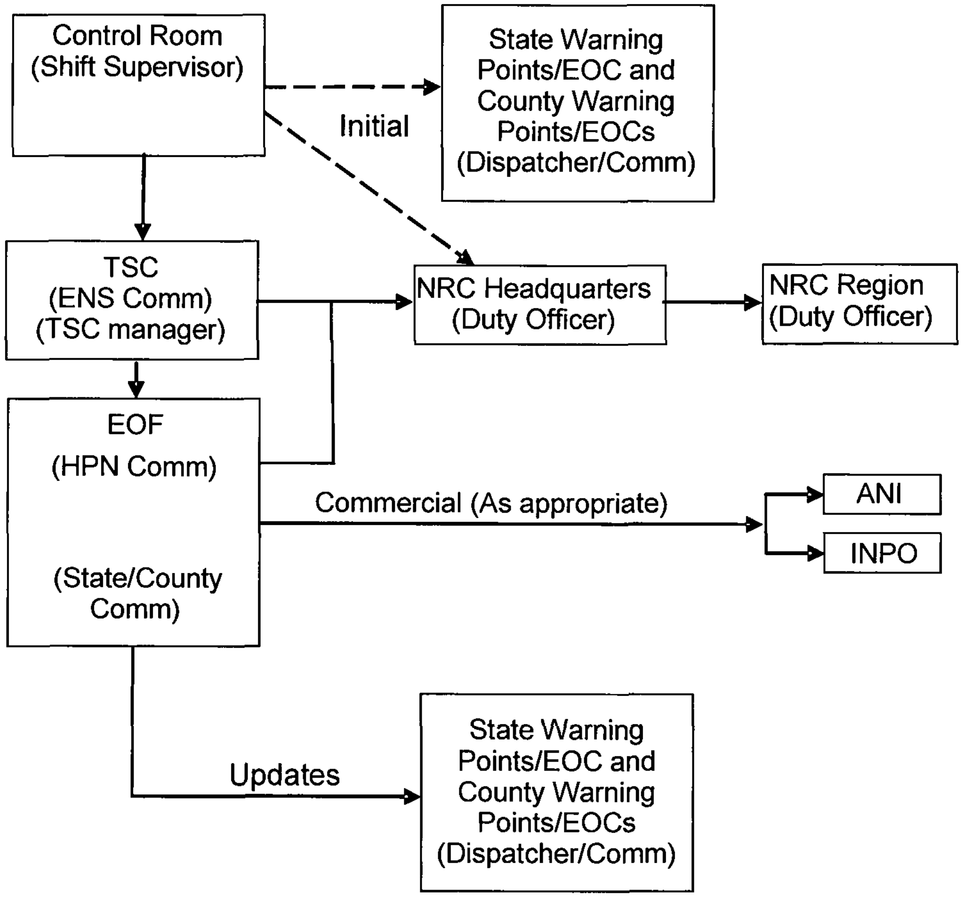
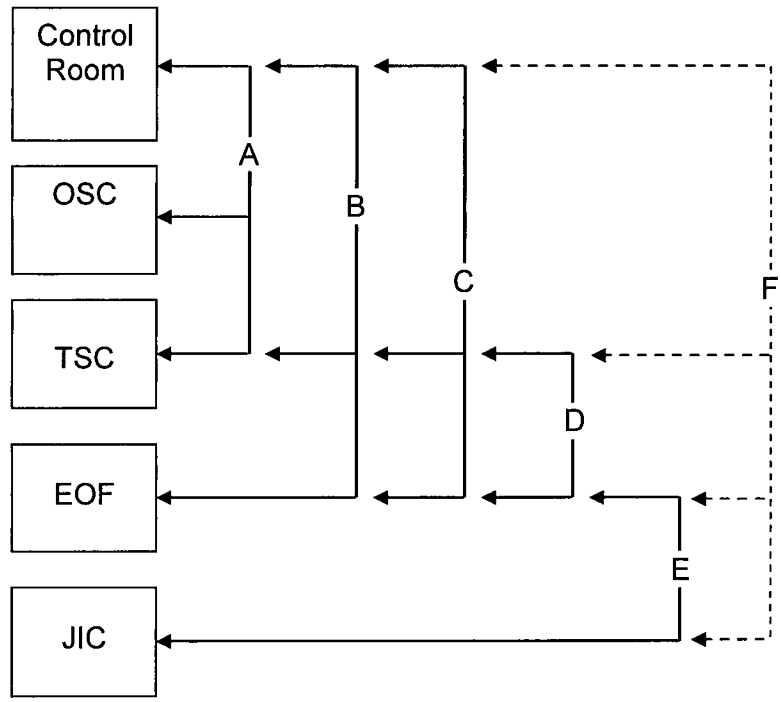


Figure F-1: Notification Scheme (After Full Augmentation)



←——Dedicated Phone Link (Independent or Limited PBX)

← - - -Station Telephone Line (PBX or Commercial)

A = Dedicated phone link dispatch OSC teams between the OSC, TSC, and Control Room.

B = Dedicated phone link for use by the ECO or OEM, ED, and Shift Supervisor between the Control Room, the TSC, and the EOF.

C = Dedicated phone link for transmission of technical data between the TSC, Control Room, and the EOF.

D = Dedicated phone link to discuss mitigating activities and priorities between the TSC and EOF.

E = Dedicated phone link to discuss changes in station or affected plant conditions and EPIO needs between the EOF and the JIC.

F = Station telephone line that is a communication link between activated facilities.

Figure F-2: ERF Communications Matrix

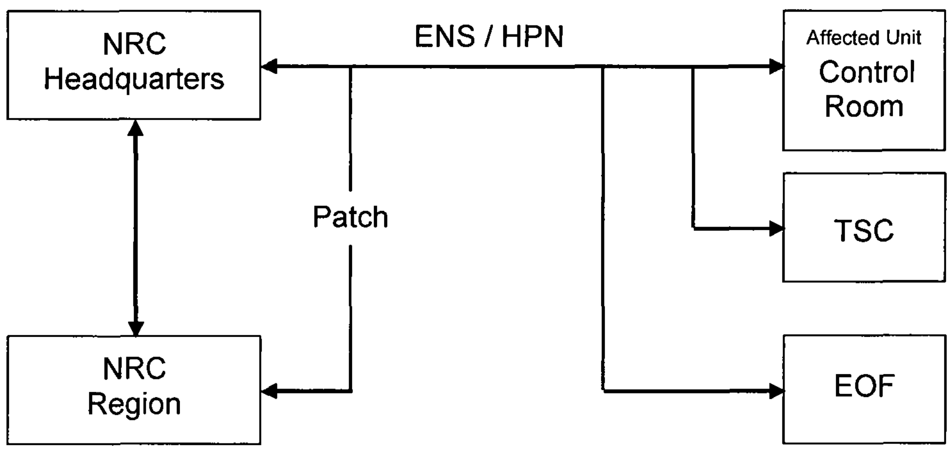


Figure F-3: NRC Communications for Nuclear Response

Section G: Public Education and Information

This section describes the VCSNS public education and information program. It outlines the methods for distributing public information materials on an annual basis and describes how the public is informed in the event of an emergency.

1. Public Information Publication

The state of South Carolina has overall responsibility for maintaining a continuing disaster preparedness public education program. The EPIO publication for the VCSNS is updated annually, in coordination with state and county agencies, to address how the general public is notified and what their actions should be in an emergency. SCE&G distributes the publication annually to all residents within the 10-mile plume exposure EPZ and to appropriate locations where a transient population may obtain a copy. The public information publication includes the following information:

a. Educational information on radiation

b. Information regarding who to contact for additional information

c. A description of possible protective measures for the public (take shelter, evacuate, and/or ingest a radioprotective drug)

d. A map of major evacuation routes

e. A list of reception centers to coordinate sheltering of evacuees and instructions on how to obtain additional information, especially for the disabled or their caretakers and those without transportation

2. Public Education Materials

Public information publications instruct the public to go indoors and turn on their radios or televisions when they hear the ANS sirens operating. These publications also identify the local radio and television stations to which the public should tune in for information related to the emergency. Information is also provided to the transient population by means of signs at local business establishments and at the entrances to recreational areas around the VCSNS with instructions to be followed in the event of an emergency at VCSNS. A list of radio and television stations that will transmit emergency information is provided on the signs. Telephone numbers where additional information can be obtained are also provided.

3. Media Accommodations

a. The SCANA Public Affairs Group is notified when an Unusual Event or higher emergency condition exists. They will handle public and media inquires in the early stages of the event (until the JIC is activated) by distributing background information, news releases, and providing information to SCANA management.

1) The EPI Organization: The EPIO is part of the ERO. It may be activated at any time at the discretion of VCSNS management. However, when there is a procedural requirement to activate the EOF, the EPIO shall also be activated.

The primary purpose of the EPIO is to disseminate information from VCSNS's ERO about the emergency events to the public, via the news media. However, the

authority for issuance of news releases for the classification of an Unusual Event or before to ERO activation will always reside with the SCANA Public Affairs Group. Upon activation, the EPIO has the responsibility and authority for issuance of news releases to the public after the information gains the approval of the Company Spokes Person.

The EPIO is comprised of senior managers from SCANA who will function as spokespersons, and other individuals including personnel from VCSNS and the SCANA Governmental Affairs and Human Resources areas. SCANA's spokespersons disseminate information to the news media/public concerning the emergency events out of the JIC.

2) The Joint Information Center: The JIC is the facility in which media personnel gather to receive information related to the emergency event. The JIC is the location where approved news releases will be provided to the media for dissemination to the public. News releases are coordinated between the EOF and JIC personnel and state and/or federal representatives in the JIC. Public information personnel operate designated portions of the EOF or from the JIC, which is under the direction of the ECO/Company Spokesperson and functions as the single point of contact to interface with federal, state, and local authorities who are responsible for disseminating information to the public.

VCSNS has a designated JIC co-located with the EOF. The JIC is equipped with appropriate seating, lighting, and visual aids to allow for public announcements and briefings to be given to the news media. Additionally, the JIC is equipped with commercial telephone lines for making outgoing calls. The EPIO functions from the JIC and EOF in preparing and releasing VCSNS information regarding the emergency event. The JIC is activated at the discretion of the Emergency Control Officer in the EOF. Functions of the JIC include:

- Serving as the primary location for accumulating accurate and current information regarding the emergency conditions and writing news releases
- Providing work space and phones for public information personnel from the state, counties, NRC, FEMA, and industry-related organizations
- Providing responses to media inquiries through Media Monitoring Staff telephones that the media can call for information about an emergency

b. The news media is not permitted into the EOF during an emergency.

4. Coordination of Public Information

a. The JIC is staffed by SCANA, VCSNS, and federal, state, and county government public information representatives who will be the source of public information during an emergency at the station. The ECO (Company Spokesperson) is the primary spokesperson for SCANA. The ECO (Company Spokesperson) has direct access to all necessary information (see Section B.5). All information will be coordinated before conducting news briefings.

b. Rumors or misinformation are identified during an emergency by the Media Monitors and Rumor Control Monitors. They respond to telephone calls from the public and the media, and monitor media reports.

5. Media Orientation

Emergency Preparedness, in conjunction with SCANA Public Affairs Group, offers programs (at least annually) to acquaint news media with the Emergency Plan, information concerning radiation, and points of contact for release of public information in an emergency.

Section H: Emergency Facilities and Equipment

Onsite and offsite facilities are available for emergency assessment, communications, first aid and medical care, and damage control. Of particular importance are the ERFs: the Control Room, TSC, OSCs, EOF, and JIC.

This section describes the emergency facilities and equipment used by the ERO and outlines the requirements that aid in timely and accurate response actions. It also describes the surveillance programs used to monitor and ensure that these facilities and equipment are maintained in a high degree of constant readiness.

1. Control Rooms, Technical Support Center, and Operational Support Centers

VCSNS has established a TSC that is activated upon declaration of an Alert or higher classification. VCSNS has also established three OSCs, one in each of the Units. The OSC in the affected Unit will be activated. Until they become operational, required functions of these facilities are performed by shift personnel and directed from the affected/lead Unit's Control Room. These facilities may be activated at the discretion of the IED at an Unusual Event classification.

a. Control Room: There is a Control Room for each of the Units on the site. The VCSNS reactors and major plant systems are operated from these locations. Each Control Room is equipped with instrumentation to supply detailed information on the reactor and its major systems. Each Control Room is continuously staffed with qualified licensed operators. The Control Room is the first onsite facility to become involved with the response to emergency events. The lead Control Room will be the designated location for the IED. The lead Control Room will be designated as follows: if the event is a site wide event or only affects the Unit 1 Protected Area, then the Unit 1 Control Room is the lead, if the event affects the Units 2 & 3 Protected Area only, then the Unit 2 Control Room is the lead. If the event only affects a single Unit, then that Unit's Control Room is the lead. Control Room personnel must evaluate and effect control over the emergency and initiate activities necessary for coping with the emergency until such time that augmented emergency response facilities can be activated. These activities shall include:

- Reactor and plant control
- Initial direction of all plant related operations
- Accident recognition, classification, mitigation, and initial corrective actions
- Alerting of onsite personnel

- Activation of the ERO notification system
- Activation of the ERFs
- Notification of offsite agencies
- Activation of ERDS
- Continuous evaluation of the magnitude and potential consequences of an incident
- Initial dose projections
- Recommendations for immediate protective actions for the public

As other ERFs become activated, they will provide support to the Control Room. Overall command and control of the emergency will transfer to the EOF when it is properly staffed and ready to take over these responsibilities. Throughout all emergencies, the Control Room maintains its emergency activation status until its normal operational status may be resumed or its recovery activities are initiated.

b. Technical Support Center: VCSNS has established a TSC for use during emergency situations by station management, technical, and engineering support personnel. This facility is located outside the Protected Area southwest of Unit 1 and northeast of Units 2 & 3. This location provides the ability to respond and activate the facility in a timely fashion, independent of which Unit is affected. It also will permit the use of the TSC in a security event that may curtail the entry of ERO personnel into the affected Protected Area(s). The TSC directly meets most of the requirements of NUREG 0696, "Functional Criteria for Emergency Response Facilities". It does not lend itself to face to face communications with the Control Room. The TSC is provided with communications links that can transmit and receive direct voice and data communications from any of the affected Control Rooms. These communications have alternate pathways that can also be used as needed. Security personnel are positioned in the TSC to enhance the movement of personnel between the TSC and the Control Room, as necessary. The TSC is activated for all emergencies classified as Alert or higher. Activation of this facility for other events is optional. When activated, the TSC functions include:

- Support for the Control Room's emergency response efforts
- Continued evaluation of event and classification of emergencies
- Assessment of the plant status and potential offsite impact
- Coordination of emergency response actions within the Protected Areas
- Communication with the NRC via ENS
- Activation of the ERDS or ensuring that it is activated

The TSC is the onsite location used to support the Control Rooms for assessment of plant statuses and potential offsite impact, and for implementation of emergency actions. The TSC provides technical data and information to the EOF.

Figure B-1b illustrates the staffing and organization of the TSC.

The TSC provides reliable voice communications to the Control Rooms, OSCs, EOF, and NRC. In addition, it provides facsimile transmissions capability and electronic transfer capabilities (see Section F).

The TSC is sized to accommodate a minimum of forty (40) personnel and their supporting equipment. This includes provisions for NRC representatives. The TSC is also sized and configured to accommodate a Back-up Operational Support Center (OSC). The Back-up OSC includes a designated command area and work areas for OSC personnel. Personnel will have access to plant data and network computer systems, as well as communications systems, such as telephone and radio systems.

Personnel in the TSC shall be protected from radiological hazards, including direct radiation and airborne contaminants under accident conditions with similar radiological habitability as Control Room personnel. To ensure adequate radiological protection, periodic radiation surveys of the TSC are conducted or portable radiation monitors may be used. These systems indicate radiation dose rates and airborne radioactivity inside the TSC while in use. In addition, KI is available for use as required. In the event that the TSC becomes uninhabitable, implementing procedures will provide guidance on the transfer of duties and relocation of the staff until such time that the TSC staff is able to fulfill their duties as assigned.

The TSC has access to a complete set of as-built drawings and other records, including general arrangement diagrams, piping and instrument diagrams (P&IDs), and the electrical schematics. The TSC has the capability to record and display vital plant data, in real time, to be used by knowledgeable individuals responsible for engineering and management support of reactor operations, and for implementation of emergency procedures.

The Back-up TSC is the area immediately adjacent to the lead Unit's Control Room and a Remote TSC is included in the Emergency Operations Facility Building.

The Remote TSC is designed to allow evaluators and decision makers access to plant data and network computer systems to support event evaluations, development of mitigation strategies, and determination of emergency classifications. The facility also has access to communications systems, such as telephone (land based and satellite) systems and radio systems with direct links to the onsite personnel. Using these systems, communications may be established with Security, the Units' Control Rooms, the EOF, and OSC(s). The building provides work space for engineering personnel with access to plant drawings, system information, and plant procedures. A limited number of hard copies of procedures are provided for reference or as back-up to network systems.

c. <u>Operational Support Centers</u>: The OSCs are the locations where the Unit's support personnel report during an emergency and from which they will be dispatched for assignments or duties in support of emergency operations. The affected Unit's OSC shall be activated whenever the TSC is activated, but need not remain activated at the Alert level if its use is judged unnecessary by the ED. At the Site Area Emergency and General Emergency levels, the Unit's OSC or an alternate OSC shall be activated at all times. Activation for other events is optional. VCSNS disciplines reporting to the OSCs include, but are not limited to:

- Operating personnel not assigned to the Control Room
- Health Physics personnel
- Chemistry personnel
- Maintenance personnel (Mechanical, Electrical, and I&C)

Figure B-1b illustrates the staffing and organization for the OSC

Each OSC is equipped with communication links to the Control Rooms and the TSC (see Section F). A limited inventory of supplies will be kept in the OSCs or accessible to the OSCs. This inventory will include respirators, protective clothing, flashlights, and portable survey instruments.

Refer to the Unit Annexes for additional information regarding the OSCs.

A Back-up OSC is included in the configuration and sizing of the Technical Support Center and a Remote OSC is included in the Joint Information Center Building, which also houses the EOF. The Back-up OSC includes a designated command area, work areas for OSC groups, and staging areas (break room/kitchen) for OSC Damage Control personnel.

The Remote OSC is designed to allow evaluators and decision makers access to plant data and network computer systems to support event evaluations and development of mitigation strategies and mission while planning for return to the site. The facility also has access to communications systems, such as telephone (land based and satellite) systems and radio systems with direct links to the onsite personnel. Using these systems, communications may be established with the Units' Control Rooms, the EOF, and TSC. The building provides work space for staging damage control teams and has access to plant drawings, system information, and plant procedures. A limited number of hard copies of procedures are provided for reference or as back-up to network systems.

2. Emergency Operations Facility

The EOF is the location where the ECO will direct a staff in evaluating and coordinating the overall company activities involved with an emergency. Activation of the EOF is mandatory upon declaration of an Alert or higher classification. The EOF is located in Richland County near the intersection of Bickley Road and SC Hwy 176 and is outside the 10 Mile Emergency Planning Zone and greater than 10 miles from the Technical Support Center (TSC). The EOF provides for:

- Management of overall emergency response
- Performance of the non-delegable emergency notification and PAR development ad notification functions when in command and control
- Notification of appropriate corporate and station management
- Coordination of offsite radiological and environmental assessments
- Determination of recommended public protective actions
- Management of recovery operations from an Alert or higher classification

- Coordination of emergency response activities with federal, state, and county agencies

The EOF was designed with the following considerations:

- The EOF is provided with access limiting devices when not in use and assigned security personnel during activation to ensure that only authorized personnel are permitted to enter the facility.
- The location provides optimum functional and availability characteristics for carrying out overall strategic direction of VCSNS emergency and support operations, determination of public protective actions to be recommended to offsite officials, and coordination with federal, state, and county agencies.
- It is of sufficient size to accommodate about 50 people including NRC representatives.
- It meets the criteria of NUREG-0696, "Functional Criteria for Emergency Response Facilities" regarding location, structure, habitability, size, communications, instrumentation, data system equipment, power supplies, technical data, records availability, and management. The EOF power is backed with an emergency diesel generator and has an uninterruptable power source to maintain loads during the transfer between power sources.
- It is equipped with reliable voice communications capabilities to the TSC, the Control Rooms, the NRC, and the state and county EOCs. In addition, the EOF has facsimile, computer transmission, and electronic transfer capabilities.
- Equipment is provided to gather, store, and display data needed in the EOF to analyze and exchange information on plant conditions with the station. The EOF technical data system receives, stores, processes, and displays information sufficient to perform assessments of the actual and potential onsite and offsite environmental consequences of an emergency condition.
- The EOF has ready access (either through hard copies or electronic media) to plant records, procedures, and emergency plans needed for effective overall management of VCSNS emergency response resources.
- It is designed to support a Remote TSC (RTSC) and Remote OSC (ROSC) in the event of an emergency which limits access to the site.

3. Joint Information Center

The JIC is the location where the Company Spokesperson will direct a staff in providing and coordinating the release of information during an emergency. The JIC is co-located with the EOF outside the 10-mile EPZ. The JIC provides facilities and equipment for VCSNS, federal, state, and county agencies to interface with each other and to provide a location where information regarding the event is released to the media and general public.

4. Emergency Operations Centers

EOCs operated by the state and county communities have been established to perform direction and control of emergency response functions, as outlined in their respective plans.

The respective state EOC is capable of continuous (24-hour) operations for a protracted period. These centers contain sufficient communications (radio, telephone, and facsimile) equipment, maps, emergency plans, and status boards to provide the necessary interfaces with other federal, state, county, and station emergency facilities.

The county EOCs serve as command and control headquarters for local emergency response activities as well as a center for the coordination of communications to field units and to the state EOC. These EOCs have the equipment necessary, (such as facsimile machines, telecommunications equipment, radios, photocopiers, wall maps, etc.) to carry out their emergency responsibilities.

5. Activation

NOTE: NUREG-0654 Criterion II.B.5 states that the "licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency." It further references that short period as 30 and 60 minutes. VCSNS will adequately staff its on-shift personnel to support the Control Room personnel upon declaration of an Alert or higher classification. This staffing will fulfill the NUREG-0654 Criterion II.B.5 for 30-minute responders and provides additional support to the Onshift ERO within a 75 minute response for on-call ERO personnel. The time frames for rapid augmentation of a nuclear power plant staff in the event of an emergency are not regulatory requirements but rather administrative times set by VCSNS. It is VCSNS's intent to expend its best efforts to meet the augmentation criteria times regarding staffing Emergency Response Facilities with sufficiently skilled individuals capable of handling an emergency. Due to diversity of normal residential patterns for the stations' staff, possible adverse weather conditions, and road congestion, these time frames might be exceeded.

VCSNS has put into place plans and procedures to ensure timely activation of its ERFs. The Shift Supervisor (as IED) will initiate a call-out in accordance with the emergency planning procedures. The ERO augmentation process identifies individuals who are capable of fulfilling the specific response functions that are listed in Table B-1a. This table was developed based on the functions listed in NUREG-0654, Table B-1.

Although the response time will vary due to factors such as weather and traffic conditions, a time of 75 minutes for minimum staffing, has been established for the ERO personnel responding to the station emergency facilities, following the declaration of an Alert or higher emergency classification. Additionally, plans have been developed to ensure timely functional activation and staffing of the JIC when the classification of Alert or higher classification is declared.

It is the intention of the organization to be capable of activating the applicable ERFs within 15 minutes of achieving minimum staffing. The facility can be declared activated when the following conditions are met:

a. Minimum staffing has been achieved

b. Personnel have been briefed on the situation

c. The facility is functionally capable of performing the appropriate activity

The senior manager in charge may elect to activate their facility without meeting minimum staffing if it has been determined that sufficient personnel are available to fully respond to the specific event (this would not constitute a successful minimum staff response).

The 75-minute response time and 15-minute activation times are not applicable to the JIC. Public Information personnel must first coordinate the decision to activate the JIC with the appropriate offsite authorities responding to the facility.

6. Monitoring Equipment Onsite

The station is equipped with instrumentation for seismic monitoring, radiation monitoring, fire protection, and meteorological monitoring. Instrumentation for the detection or analysis of emergency conditions is maintained in accordance with station Technical Specifications, if applicable or commitments made to the NRC. The actual instrumentation will not be described in detail in this plan. Additional details, if required, of the equipment will appear in each unit's Annex. This equipment includes, but is not limited to, the following:

a. Geophysical Monitors

1) Meteorological Instrumentation: There are two permanent meteorological monitoring stations located near the station for display and recording of wind speed, wind direction, and ambient and differential temperature for use in making offsite dose projections. Meteorological information is presented in the Control Room, TSC, and EOF by means of the plant computer system. This information is remotely interrogated using a computer or other data access terminal.

   With regard to VCSNS's meteorological monitoring program, since the meteorological facilities are not composed of structures, systems, and components that prevent or mitigate the consequences of postulated accidents and are not "safety-related," those aspects of quality assurance germane to providing good meteorological information for a nuclear power station were adopted into the Quality Assurance Program Description (QAPD).

   The National Weather Service (NWS), or regional weather forecast providers, may be contacted during severe weather periods. These providers analyze national and local weather in order to provide localized weather forecasts for the VCSNS area, as appropriate.

2) Seismic Monitoring: The seismic monitoring system measures and records the acceleration (earthquake ground motion) of the structure. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, are permanently recorded as information which defines the response spectrum. The system remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits and tape transports. It also provides signals for immediate remote indication that specific preset response accelerations have been exceeded.

3) Hydrological Monitors: The design basis flood, probable maximum precipitation, and other improbable, conceivable extremes in hydrologic natural phenomena are well below any design limits for the units as detailed in their FSARs. Hence, there are no specific, dedicated hydrological monitors.

b. Radiological Monitors and Sampling

1) The RMS: In-plant radiological measurements provide information that may help determine the nature, extent, and source of emergency conditions. The RMS is available to give early warning of a possible emergency and provides for a continuing evaluation of the situation in the Control Room. Radiation monitoring instruments are located at selected areas within the facility to detect, measure, and record radiation levels. In the event the radiation level should increase above a preset level, an alarm is initiated in the Control Room. Certain radiation monitoring instruments also alarm locally in selected areas of the facility. The RMS is divided into 3 subsystems:

a) Area Radiation Monitors are used for the direct measurement of in-plant exposure rates. The area radiation monitor readings allow in-plant exposure rate determinations to be made remotely without requiring local hand-held meter surveys. This information may be used, initially, to aid in the determination of plant area accessibility. In addition to permanent monitors, portable continuous air monitors measure airborne particulate and airborne iodine activities at various locations within the operating areas.

b) Process radiation monitors are used for the measurement of radioactive noble gas, iodine, and particulate concentrations in plant effluent and other gaseous and fluid streams.

c) The accident, or high range, RMS monitors radiation levels at various locations within the operating area. These are high range instruments used to track radiation levels under accident or post-accident conditions. These instruments include the containment monitors.

The RMS provides the necessary activity or radiation levels required for determining source terms in dose projection procedures. Key RMS data is linked to the plant computer, which allows information to be passed to the TSC and EOF. The isotopic mix, including isotopes such as those in Table 3 of NUREG-0654, is based upon a default accident mix. Refer to the unit-specific FSAR for further detail on the RMS capabilities and design.

2) Liquid and Gaseous Sampling Systems: The process sampling system consists of the normal sampling system and additional sampling panels located throughout the plant. Sampling systems are installed or can be modified to permit reactor coolant and containment atmosphere sampling even under severe accident conditions.

The sampling systems use a number of manual sampling techniques to enable reactor coolant and containment sampling operations over a wide range of plant conditions. They are capable of providing information relative to post-accident plant conditions to allow operator actions to be taken to mitigate and control the course of an accident. Refer to the respective Unit's FSAR for further detail on sampling capabilities.

3) Portable Radiation Monitoring Equipment: Portable radiation survey instruments are available for a wide variety uses such as area, sample, and personnel surveys and continued accident assessment. Instruments are stored throughout the plant and in the emergency facilities.

c. Process Monitors: The Control Room and applicable redundant backup locations are equipped with extensive plant process monitors for use in both normal and emergency conditions. These indications include but are not limited to reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, status or lineup of equipment components. This instrumentation provides the basis for initiation of corrective actions.

1) Plant Monitoring/Information System: A plant monitoring/information system provides the data acquisition and database capability for performing plant monitoring and functions. The system is designed to scan, convert to engineering units, conduct reasonability and alarm limit checks, apply required transformations, store for recall and analysis, and display the reading of transformed data from plant instrumentation. The system scans flows, pressures, temperatures, fluid levels, radiation levels, equipment, and valve status at required frequencies. Scanned variables are quality tagged. The system provides for short and midterm storage of data for online retrieval and fast recall, and long-term storage to appropriate media.

2) Safety Parameter Display System (SPDS): SPDS provides a reliable display of plant parameters from which the safety status of operation may be assessed in the Control Room, TSC, and EOF for the station. The primary function of the SPDS is to help operating personnel in the Control Room make quick assessments of plant safety status. SPDS and/or other display systems in the TSC and EOF promote the exchange of information between these facilities and the Control Room and assists the emergency organization in the decision making process. It also provides data trending information regarding current and past status of the affected Unit(s).

d. Fire Detection System: The fire detection system is designed to quickly detect visible or invisible smoke (or other products of combustion) and/or heat in designated areas of the plant. The fire alarm communication systems and subsystems are located at strategic points throughout the plant to warn personnel of a nuclear incident or other emergency conditions. Existing plant alarm systems are sufficiently audible to alert personnel in the event of a fire or need for assembly. These alarm communication systems consist of warning sirens and lights (in high noise areas) and the PA system. Refer to the respective Unit'sFSAR for further description of the unit's fire protection system.

7. Monitoring Equipment Offsite

VCSNS has made provisions to acquire data from and have access to the following offsite sources of monitoring and analysis equipment:

a. Geophysical Monitors: In the event that both onsite meteorological towers or monitoring instrumentation becomes inoperative, meteorological data may be obtained directly from the NWS or the internet.

A South Carolina State Network (SCSN) seismometer is located about 3.2 miles east-southeast of the VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The SCSN seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

In addition, a central point of contact is the National Earthquake Information Service in Golden, Colorado to obtain information about a seismic event.

The EOF will coordinate hydrology and seismology expertise in the event onsite information becomes unavailable.

b. Radiological Environmental Monitors and Sampling: The state of South Carolina DHEC will conduct an extensive offsite environmental monitoring program to provide data on measurable levels of radiation and radioactive materials in the environs.

VCSNS also maintains an offsite environmental monitoring program as well. The program is described fully in the Offsite Dose Calculation Manual and includes:

- Fixed continuous air samplers
- Routine sampling of river water, milk, and fish
- A fixed thermo-luminescent dosimeter (TLD) monitoring network

The TLD program consists of the following elements:

- A near-site ring of dosimeters covering the 16 meteorological sectors
- A 16-sector ring of dosimeters placed in a zone within about 5 miles from the plant
- TLDs placed at each of the normal fixed air sampler locations (typically about 8-15 air samplers)

c. Laboratory Facilities: External facilities for counting and analyzing samples can be provided by the other nuclear stations in the area. These laboratories can act as backup facilities in the event that the station's counting room(s) and laboratory become unusable or the offsite radiological monitoring and environmental sampling operation exceeds the capacity of the station capabilities during an emergency. It is estimated that these laboratories will be able to respond within several hours from initial notification.

Outside analytical assistance may be requested from state and federal agencies, or through contracted vendors. The state maintains a radiological laboratory that provides independent analysis. The DOE, through the Interagency Radiological Assistance Program has access to any national laboratory with DOE contract (i.e., Savannah River Site, Brookhaven, Oak Ridge, Lawrence Livermore, etc.).

A general description of the laboratory capabilities is provided in Section C.3.

8. Offsite Monitoring Equipment Storage

VCSNS maintains a sufficient supply of emergency equipment (such as portable survey, counting, and air sampling instrumentation and other radiological monitoring equipment and supplies) that may be used for environmental monitoring. These supplies meet the initial requirements of two environmental Field Monitoring Teams. During subsequent phases of an emergency, additional equipment is available from other utility or state Field Monitoring Teams, INPO mutual aid, and offsite response organizations.

9. Meteorological Monitoring

The station has installed and maintains two meteorological towers equipped with instrumentation for continuous reading of the wind speed, wind direction, air temperature,

and vertical temperature difference (ΔT). Additional capabilities are available to obtain representative current meteorological information from other sources, such as the NWS. A full description of the onsite meteorological capabilities is given in Section 4 of the unit Annexes.

10. OSC Capabilities

Each OSC provides an area for coordinating and planning of OSC activities and the staging of personnel. Additional space is available in adjacent offices and locker rooms to accommodate additional personnel as may be required. Alternate locations are available. The onsite storerooms maintain a supply of parts and equipment for normal plant maintenance. These parts, supplies, and equipment are available for damage control use as necessary.

Sufficient radiation protection equipment (i.e., protective clothing, respiratory protection gear, KI, and other health physics equipment and supplies) is stored and maintained near the OSC (as well as the other ERFs). Damage Control Team equipment is available in the maintenance shops which are near the OSCs. This equipment may include items such as a camera, portable lighting, and additional portable communications equipment. The areas near the OSC are stocked with an assortment of first aid and medical treatment equipment and supplies. When an emergency condition exists at one Unit, additional supplies can be obtained from other unaffected units and through corporate resources upon request. The OSC maintains reliable voice communications with the Control Room, TSC, and EOF. For a description of communications equipment, refer to Section F.

11. Facility and Equipment Readiness

Emergency facilities and equipment are inspected and inventoried in accordance with emergency preparedness procedures. These procedures provide information on location and availability of emergency equipment and supplies. An inventory of all emergency equipment and supplies is performed on a quarterly basis and after each use in an actual emergency or drill. During this inventory, radiation monitoring equipment is checked to verify that required calibration period and location are in accordance with the inventory lists. Surveillances include an operational check of instruments and equipment. Equipment, supplies, and parts which have a shelf-life are identified, checked, and replaced as necessary. Sufficient reserves of instruments and equipment are maintained to replace those which are removed from emergency kits or lockers for calibration or repair.

12. Emergency Equipment and Supplies

Below is a list of typical equipment and supplies dedicated for emergency use in the VCSNS ERFs. Refer to Emergency Equipment Checklist Procedure for specific equipment and supplies found in the various locations:

Control Rooms

- Emergency Plan Implementing Procedures
- Drawings of Facility and Plant Site
- Self-Contained Breathing Apparatus
- Portable radios
- Telephone (landlines and satellite)

- Dose Assessment Computer
- Potassium Iodide (KI) (provided by the OSC)

Operational Support Centers

- Protective clothing, Self Contained Breathing Apparatus, and respirators may be stored in alternate areas of the plant with access from the OSC
- Emergency Plan Implementing Procedures
- Telephones
- Flashlights w/batteries
- Portable Survey Meters
- Dosimetry (TLDs and Self-Reading Dosimeters)
- Portable Air Sampler
- Air Sampler Filter paper
- Silver Zeolite cartridges
- Potassium Iodide (KI)
- 800 MHz Radio

Technical Support Center

- Telephones
- Flashlights w/batteries
- Emergency Plan Implementing Procedures
- Graphs, Overlays, and Maps
- Drawings of Facility and Plant Site
- Potassium Iodide (KI)

Emergency Operations Facility

- Dose Assessment Computer
- Telephones
- Flashlights w/batteries
- Emergency Plan Implementing Procedures
- Graphs, Overlays, and Maps
- Drawings of Facility and Plant Site

Joint Information Center

- Telephones
- Flashlights w/batteries
- Emergency Plan Implementing Procedures
- Graphics, Overlays, and Maps
- Graphics of Facility and Plant Site
- Media Monitoring devices

13. General Use Emergency Equipment

Inventory procedures identify the equipment that comprise the kits used in an emergency situation that are available within each emergency facility.

14. Collection Point for Field Samples

The environmental lab located in a SCE&G facility near site has been designated as the central point for the receipt and analysis of radiological field monitoring samples. Sampling and analysis equipment is available for activity determination of these samples. Sufficient field monitoring equipment is maintained at the station for initial sampling. Instrumentation and equipment used for sample activity determination are routinely calibrated to ensure timely availability.

Section I: Accident Assessment

To effectively coordinate and direct all facets of the response to an emergency situation, diligent accident assessment efforts are required throughout the emergency. All four emergency classifications have similar assessment methods; however, each classification requires a greater magnitude of assessment effort dependent upon the plant symptoms and/or initiating event(s).

1. Plant Parameters and Corresponding Emergency Classification

Plant system and effluent parameter values are used in the determination of accident severity and subsequent emergency classification. Environmental and meteorological events are also determining factors in emergency classification. An emergency condition can be the result of just one parameter or condition change, or the combination of several. The specific symptoms, parameter values or events for each level of emergency classification are detailed in the emergency implementing procedures. Specific plant system and effluent parameters that characterize a classifiable event (EALs) are presented in the Unit Annexes.

In order to adequately assess the emergency condition, each emergency facility has the necessary equipment and instrumentation installed to make available essential plant information on a continuous basis. Evaluation of plant conditions is accomplished through the monitoring of plant parameters both from indication in the Control Room and within the plant. Some of the more important plant parameters to be monitored in the Control Room are assembled into a single display location, which is entitled the SPDS. The SPDS monitors such parameters relative to the plant design such as: reactor coolant system pressure, reactor or pressurizer water level, containment pressure, reactor power, safety system status, containment radiation level and effluent monitor readings. The instrumentation and equipment capabilities available for each emergency facility are described in Section H.

2. Onsite Accident Assessment Capabilities

The resources available to provide initial and continuing information for accident assessment throughout the course of an event include plant parameter display systems, liquid and gaseous sampling system, Area and Process RMSs, and Accident RMSs (which includes the high range containment radiation monitors). Descriptions of these systems are given in Section H.6.b.

3. Source Term Determination

Source term (or core damage) estimations serve several roles within the VCSNS Emergency Preparedness Program. For planning purposes, core damage considerations are used as the bases for several of the EAL ICs and as the threshold for the declaration of a General Emergency (the definition of a General Emergency specifies conditions which involve 'substantial' core degradation or melting as one of the bases for classification).

From an implementation perspective, core damage estimations provide a means of realistically differentiating between the four core states (no damage, clad failure, fuel melt, and vessel melt-through) to:

- Evaluate the status of the fuel barriers and how their status relates to the risks and possible consequences of the accident
- Provide input on core configuration for prioritization of mitigating activities
- Determine the potential quality (type) and/or quantity (%) of source term available for release in support of projected offsite doses and PARs
- Provide information that quantifies the severity of an accident in terms that can be readily understood and visualized
- Support the determination of radiological protective actions that should be considered for long term recovery activities

The assessment methodologies used by VCSNS are intended to provide a rapid best estimate of core damage which, when evaluated together, help to develop an overall picture of the extent of core damage. The methods used to estimate the amount or type of core damage occurring under accident conditions includes the following:

- Containment Radiation Monitors: An indirect method used to determine the amount of core damage. Applicable to loss of coolant accident (LOCA) scenarios. Based on an end-of-life source term and static nuclide ratio assumptions yielding a limited accuracy. Valid any time following an accident.
- Core Temperatures: Methods such as core exit thermocouple, peak core temperatures, and hot leg temperatures provide indirect methods used to indicate the type and/or amount of core damage. Applicable for all types of accidents. Valid any time following an accident.
- Core Uncovery: Methods such as core uncovery time, reactor vessel level, and source range monitor count rate provide indirect methods used to indicate the type of core damage (clad failure or fuel melt). Applicable for all types of accidents. Provides a relatively accurate estimate of the state of the core early in the event. Valid any time following an accident.
- Containment Hydrogen Concentration: An indirect method used to establish the type of core damage. Applicable to LOCA-type accidents where all the Hydrogen generated by the metal-water reaction is released into containment. Valid any time following an accident.
- Sample Analysis — Isotopic Ratio Comparison: A direct method used to establish the type of core damage. Compares expected isotopic ratios with a sample to determine a general core state. Applicable under all types of accidents. Valid any time following an accident.
- Sample Analysis — Presence of Abnormal Isotopes: A direct method used to provide a go/no-go indication of fuel melt by the presence of unusually high concentrations of the less volatile fission products. Applicable under all types of accidents. Valid any time following an accident.

- Sample Analysis — Concentration Evaluation: A direct method that yields the most accurate numerical estimations of the amount of core damage. Applicable for all types of accidents. Requires the sampled system(s) be in a steady state that usually prevents its use until the plant is in a stable condition.

4. Effluent Monitor Data and Dose Projection

Dose assessment or projection represents the calculation of an accumulated dose at some time in the future if current or projected conditions continue. During an accident, the plant parameter display system and personal computers will provide the ERO with the timely information required to make decisions. Radiological and meteorological instrumentation readings are used to project dose rates at predetermined distances from the Station, and to determine the integrated dose received. Dose assessment methods used by the ERO to project offsite doses include:

a. Monitored Release Points: This method uses the plant's effluent radiation monitors and system flow rates. Effluent release points are used to directly calculate a release rate. The point of the release determines the way the source term is affected and is adjusted by the dose assessment process.

b. Containment Leakage/Failure: This method uses a variety of containment failures or leak rates in conjunction with available source term estimations to develop a release rate to the environment. A direct vent of containment can be modeled as a failure to isolate.

c. Release Point Samples: This method uses a sample at the release point and an estimated flow rate to develop a release rate at the point of release.

d. Field Monitoring Team Data: This method uses a field survey or sample and the atmospheric model to back calculate a release rate and ratio concentrations of radioactive material at various points up and downwind of plume centerline.

The computer applications used to provide dose calculations are evaluated against the EPA-400 plume exposure PAGs applicable for the early phase of an accident. These evaluations place an emphasis on determining the necessity for offsite PARs. Dose assessment actions will be performed in the following sequence:

First: Onset of a release to one hour post-accident: Shift personnel will rely on a simplified computerized dose model to assist them in developing offsite dose projections using real time data from effluent monitors and site meteorology.

Second: One hour post-accident to event termination: Estimates of offsite doses based on more sophisticated techniques are provided. Dedicated ERO personnel will analyze the offsite consequences of a release using more complex computerized dose modeling. These additional methods are able to analyze more offsite conditions than the simplified quick method, as well account for more specific source term considerations.

5. Meteorological Information

Local meteorological data is available from the onsite meteorological towers. The data available includes wind speed, wind direction, temperature, and vertical temperature

difference (ΔT). This data is used by VCSNS, the state, and NRC to provide near real-time predictions of the atmospheric effluent transport and diffusion. Meteorological data from the tower are available in the Control Room, TSC, and EOF. A full description of the onsite meteorological capabilities is given in Section 4 of the Unit Annexes.

6. Unmonitored Release

Dose projections can be made during a release through use of actual sample data in situations where effluent monitors are either off-scale or inoperative or the release occurs by an unmonitored flow path. In the absence of effluent sample data, a dose projection can be performed simply by specifying the accident category as a default. The selection of a default accident category defines the mix, the total curies, and the release pathway(s). The total number of curies from a default mix for each isotope is used to provide an upper bound for release concentration, and hence, an upper bound for the dose rate and dose to the public.

7. Field Monitoring

In addition to the capabilities and resources described in Section H.7.b and H.8, VCSNS maintains the ability to take offsite air samples and to directly measure gamma dose rates in the event of an airborne or liquid release. The capability to take offsite soil, water, and vegetation samples is also provided by either the Field Teams or South Carolina Department of Health and Environmental Control (SCDHEC) Teams.

The environmental monitoring equipment, as described in Section H, includes portable survey, counting, and air sampling instrumentation and other radiological monitoring equipment and supplies to be used by the Field Monitoring Teams. Samples are taken at predetermined locations as well as those specified both during and after a release. Environmental measurements are used as an aid in the determination and assessment of protective and recovery actions for the general public.

8. Field Teams

Field Teams are dispatched by VCSNS to perform a variety of functions during conditions that may involve significant releases of radioactive materials from the plant. Radiological survey and sample data is used to define affected area boundaries, verify or modify dose projections and PARs, and assess the actual magnitude, extent, and significance of a liquid or gaseous release.

In addition to contamination and dose rate measurements, the change out of environmental TLDs can be performed. Other actions may include soil, water, and vegetation sampling.

The initial environmental surveys involve simple-to-perform measurements to quickly confirm or modify the dose projections based on plant parameters. Subsequent environmental monitoring efforts will be aimed at further defining the offsite consequences including instituting an expanded program to enable prompt assessments of any subsequent releases from the plant.

The expertise necessary to conduct limited offsite environmental survey and sampling exist onsite 24 hours a day. A minimum of two offsite Field Teams are notified and activated at an Alert or higher classification. Teams are composed of two individuals who are assembled at a near site SCANA facility to use dedicated survey and sampling equipment. Teams are then dispatched in company vehicles into the surrounding area when a release is ongoing or

is expected to occur. Radiological survey and sample data is transmitted to the emergency facilities. SCDHEC support can be used to perform collection, shipment, and analysis of environmental sample media.

9. Iodine Monitoring

Field monitoring equipment has the capability to detect and measure airborne radioiodine concentrations as low as 1×10^{-7} µCi/cc in the field. Interference from the presence of noble gas and background radiation will be minimized by ensuring that monitoring teams move to areas of low background before analyzing the sample cartridge. The collected air sample is measured by hand-held survey meter as an initial check of the projection derived from plant data to determine if significant quantities of elemental iodine have actually been released (the chemical form that would pose a health hazard).

10. Dose Estimates

Specific procedures exist for the correlation of air activity levels to dose rate for key isotopes. These procedures also provide a method to estimate the integrated dose from the projected and actual dose rates and for the comparison of these estimates with the PAGs.

11. State Monitoring Capabilities

The state (SCDHEC) has the ability to dispatch their own field monitoring teams to track the airborne radioactive plume. The state also has the ability and resources to coordinate with federal and VCSNS monitoring teams to compare sample results.

Section J: Protective Response

Protective response consists of emergency actions, taken during or after an emergency situation, which are intended to minimize or eliminate hazards to the health and safety of the public and/or station personnel. A range of protective actions has been developed for emergency workers and the general public in the plume exposure pathway EPZ. Additionally, guidelines have been established to aid in choosing protective actions during an emergency that are consistent with federal guidance. VCSNS is responsible for onsite actions, while the responsibility for offsite actions rests with the state, county, and other offsite response agencies.

1. Notification of Onsite Personnel

For all emergency classifications, all personnel within the Owner Controlled Area (OCA) are notified of the initial classification or escalation of an emergency by recognizable alarms, and/or verbal announcements over the plant public address system. Announcements include the emergency classification and response actions to be taken by personnel onsite (such as ERO, non-ERO, contractor personnel, and visitors). Contractors and visitors will be provided information on how to respond in the event of an emergency. Provisions are made to alert personnel in high noise areas and outbuildings within the Protected Areas as applicable.

The station has identified locations where people might be expected to be present outside the Protected Areas but within the OCA. Accountability of persons within the OCA but outside the Protected Areas is not required. However, provisions including public address system announcements, sirens, and security patrols are established for notification of personnel within the OCA any time a site evacuation has been initiated, or as otherwise deemed appropriate.

2. Evacuation Locations

If a site evacuation is required, nonessential personnel are directed to either assemble within designated assembly areas or to immediately evacuate the site. Personnel will be directed to either proceed to their homes or to reassemble at designated offsite locations (Offsite Holding Areas). Visitors to the station will assemble with and follow the instructions of their escorts. Nonessential personnel within the Protected Areas will normally exit through the normal access point. Personal transportation (if available) will normally be used and established evacuation routes will be followed. Personnel without transportation will be identified and provided transportation as necessary. Personnel needing transportation are instructed to request assistance from personnel evacuating the site. In the event that personal vehicles cannot be utilized for evacuation, the IED or ED will request offsite assistance to support personnel evacuation.

3. Radiological Monitoring of Evacuees

Personnel evacuating the site will be monitored for contamination by the portal monitors as they exit the Protected Areas, with portable friskers in assembly areas, or sent to offsite monitoring locations on an as needed basis. If there is no release of radioactive materials within the affected unit, limited monitoring may be used to speed the evacuation process.

4. Protective Actions for Onsite Personnel

Evacuation is the primary protective action anticipated for onsite personnel not having immediate emergency response assignments. The station has identified locations that serve as assembly areas and offsite locations (Offsite Holding Areas) for nonessential personnel when they are not instructed to proceed home. The specific locations of these areas are provided in the Unit Annexes. Implementing procedures describe equipment, supplies, and general operation of these facilities. The ED will designate personnel within the OCA as essential or nonessential. Evacuation of nonessential personnel is usually conducted immediately after accountability if a Site Area Emergency or General Emergency has been declared and conditions permit. Evacuation shall commence in accordance with VCSNS procedures as directed by the IED or ED or his/her designee, unless one of the following conditions exist:

a. Severe weather conditions threaten safe transport

b. A significant radiological hazard would be encountered

c. There is a security threat occurring that would have an adverse impact on the personnel while leaving the site

d. A condition similar to the above in magnitude, which in the opinion of the OEM, IED, or ED would adversely affect the site personnel

Security forces will be dispatched, when available, to access road(s) to control entry to site facilities. Unauthorized and non-ERO personnel will be denied entry.

The initiation of a site evacuation will be reported to the appropriate state and county agencies.

In the event that evacuation is not the best protective action, the onsite personnel will be directed to take other protective actions including: sheltering for extremely inclement weather or during an ongoing radiological release and take immediate cover for security events when evacuation will place personnel in jeopardy.

5. Accountability

The purpose of accountability is to determine the locations of all personnel inside the Protected Areas and to muster emergency personnel at prearranged locations. When accountability of onsite personnel is determined to be necessary by the IED or the ED, all personnel within the Protected Areas shall be accounted for and the names of missing individuals (if any) are determined within 30 minutes of the announcement. Should missing personnel be identified, search and rescue operations are initiated.

Accountability is usually performed in conjunction with assembly, and is required to be initiated whenever a Site Area Emergency or higher classification is declared. The movement of personnel for the purposes of accountability may be delayed if their health and safety could be in jeopardy, such as severe weather or for security concerns.

If it is determined that the prearranged assembly area is unfit for personnel, the IED or the ED may designate an alternative assembly area and direct personnel using appropriate communication systems that are available.

Once established, accountability within the Protected Areas is maintained throughout the course of the event, unless specifically terminated by the ED.

6. Provisions for Onsite Personnel

VCSNS maintains an inventory of respiratory protection equipment, anti-contamination clothing, and KI that is made available to emergency workers remaining onsite should conditions warrant. During the course of an emergency, protective actions are considered to minimize radiological exposures or contamination problems associated with all onsite personnel. For those who must work within the restricted area of the affected unit, measures that are considered are:

a. Use of Respirators: On-shift and emergency response personnel use respiratory protection in any environment involving exposure to high level gaseous activity or oxygen deficient atmosphere, or where air quality is in doubt. In the presence of airborne particulates, emergency response personnel may be directed by Health Physics personnel to use full-face filter-type respirators. The criteria for issuance of respiratory protection are described in Radiation Protection procedures.

b. Use of Protective Clothing: Anti-contamination clothing, located in or near the OSC and station dress out areas is available for use by onsite personnel. The criteria for issuance of protective clothing are described in Radiation Protection procedures.

c. Use of Potassium Iodide (KI): The use of KI may be recommended when a projected dose of 25 Rem committed dose equivalent (CDE) is exceeded for an emergency worker's thyroid. This is the value specified in EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents." The OSC and the TSC maintain a supply of KI. The Radiological Assessment Supervisor has the responsibility for approval of issuing KI to VCSNS onsite emergency workers.

7. Mechanism for Implementing Protective Action Recommendations

Plant conditions, projected dose and dose rates, and/or field monitoring data are evaluated to develop PARs for the purpose of preventing or minimizing exposure to the general public. PARs are provided to the offsite agencies responsible for implementing protective actions for the general public within the 10-mile EPZ. PARs are approved by the ECO.

In an emergency that requires immediate protective actions be taken before activation of the offsite emergency facilities, PARs are provided directly to the state and county 24 hour warning points by the IED.

8. Evacuation Time Estimate

An independent Evacuation Time Estimate Study has been performed to provide estimates of the time required to evacuate resident and transient populations surrounding the VCSNS site for various times of the year under favorable and adverse conditions. Evacuation Time Estimate for evacuation of the plume exposure EPZ is referenced in Appendix 5 and detailed in the referenced Evacuation Time Estimate Study.

9. Capability of Implementing Protective Action Recommendations

The responsibility for implementing protective measures based on PAGs for the offsite population at risk is the responsibility of the state and county governments. Detailed procedures for public protective actions are contained in the state and county radiological emergency response plans as appropriate.

The state agencies are responsible for evaluation of VCSNS PARs and preparing a recommendation to the governor, or his/her appointed agent. The decision made and the order given based on the state agencies' recommendation becomes the Protective Action Directive (PAD) which is implemented by the offsite agencies. The counties within the 10-mile EPZ may make PADs prior to those of the governor when they determine the need to protect the health and safety of the public in their county.

If the plant conditions are stable and offsite radiological conditions are such that the public health and safety are not endangered, then return to evacuated areas may be discussed with the state. State authorities are responsible for actually recommending return and transmitting this recommendation.

10. Implementation of Protective Action Recommendations

The VCSNS, state, and county emergency plans used to implement the protective measures for the plume exposure pathway take numerous factors into consideration. Among these considerations are:

a. Most of the public evacuees are expected to travel in their own vehicles, leaving the EPZ via designated evacuation routes. The state and county plans contain official maps and information on the locations of reception centers and shelters.

b. The population distribution around the station for the 10-mile radius is illustrated in Figure J-1. More details of populations can be found in the Evacuation Time Estimate, see Appendix 5 for revision details.

c. As indicated in Section E, offsite agencies are notified in the event the Emergency Plan is activated. State and county agencies have the capability to notify members of the transient and resident population within the plume exposure pathway EPZ.

d-l. Items addressed separately in state and county emergency plans.

m. At a General Emergency classification, VCSNS will provide the state and counties with PARs for the public. For incidents involving actual, potential, or imminent releases of radioactive material to the atmosphere, EPA 400-R-92-001, the NRC Response Technical Manual (RTM-96) and NUREG-0654, Supp. 3 are used as the basis for the general public PARs.

1) Plant-Based PARs

Figure J-2 has been developed to aid VCSNS personnel providing PARs based on the above. Possible plant-based PARs issued at a General Emergency include:

- Shelter of the general public within a two mile radius and five miles downwind (puff release above PAGs) and institute KI policy

- Evacuation of the general public within a two mile radius and five miles downwind and institute KI policy

- Evacuation of the general public within a five mile radius and ten miles downwind and institute KI policy

In addition to the above actions to minimize or prevent potential exposure to radiation, a recommendation for the remainder of the EPZ to monitor the Emergency Alerting Station(s) will be provided to the offsite authorities.

2) Dose-Based PARs
Evacuation is recommended if projected doses reach the minimum EPA PAGs (1 Rem TEDE or 5 Rem CDE thyroid).

Shelter is recommended if projected doses reach the minimum EPA PAGs (1 Rem TEDE or 5 Rem CDE Thyroid) **AND** a puff release is in progress.

Many assumptions exist in dose assessment calculations, involving both source term and meteorological factors, which make computer predictions over long distances suspect. However, in the event dose assessment results indicate the need to recommend actions beyond the outer EPZ boundaries, Field Teams are dispatched to downwind areas to verify the calculated exposure rates before issuing ad hoc PARs outside the EPZ.

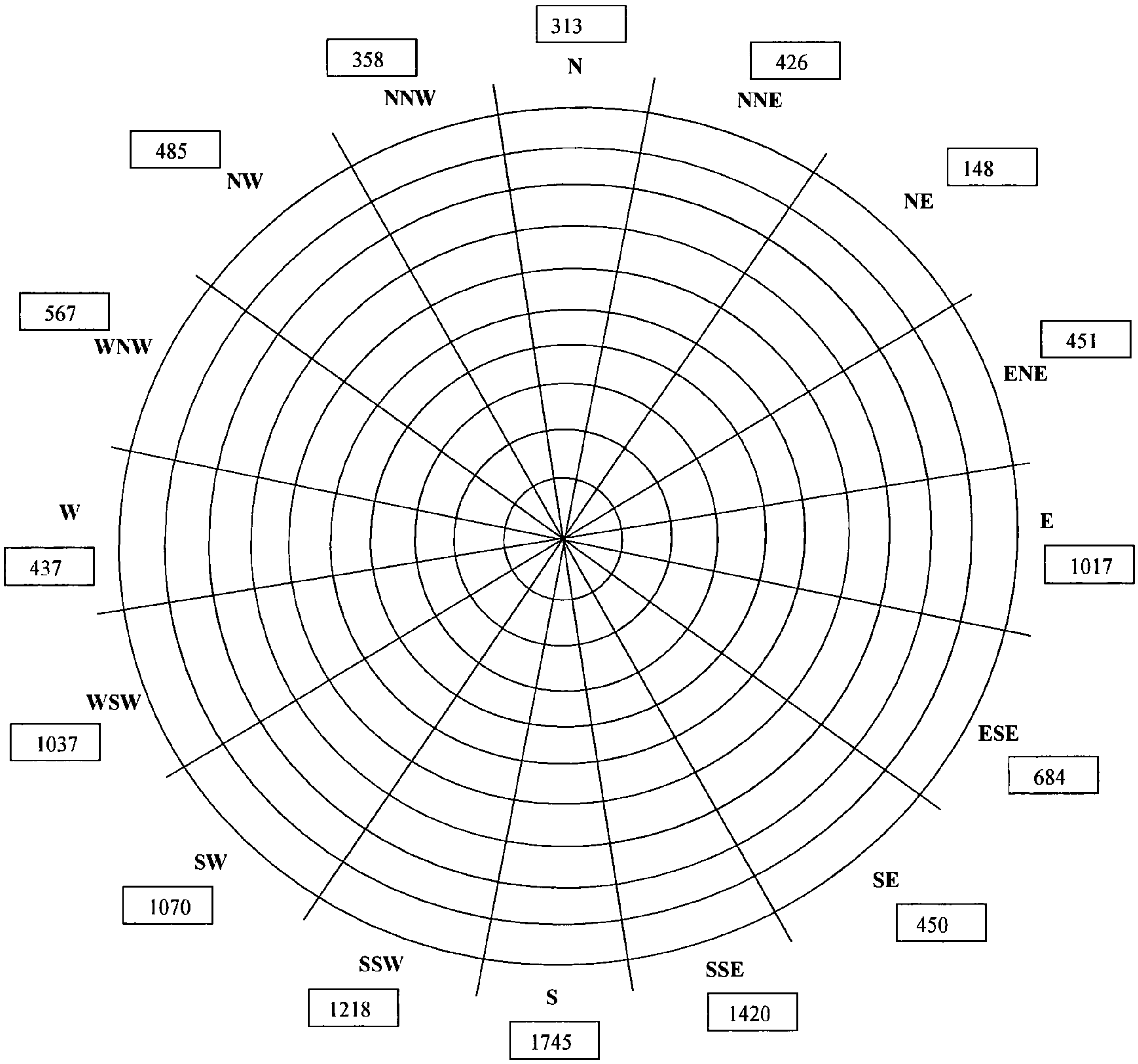
Station personnel normally do not have the necessary information to determine whether off site conditions would require sheltering instead of evacuation. An effort to base PARs on external factors (such as road conditions, traffic/traffic control, weather, or offsite emergency response capabilities) is usually performed by the state.

11. Ingestion Pathway Protective Measures

The responsibility for specifying protective measures to be used for the ingestion pathway rests with the states of South Carolina and North Carolina. These measures include the methods for protecting the public from consumption of contaminated water and foodstuffs.

12. Monitoring of Evacuees

The state and county organizations have the capability to register and monitor evacuees at designated reception centers. This capability includes personnel and equipment capable of monitoring residents and transients evacuating from the plume exposure EPZ and arriving at the reception centers, in accordance with FEMA guidelines.



Ring	Total Population
0–2 mile	246
0–5 mile	1,728
0–10 mile	12,988

Figure J-1: Sector Population Distribution

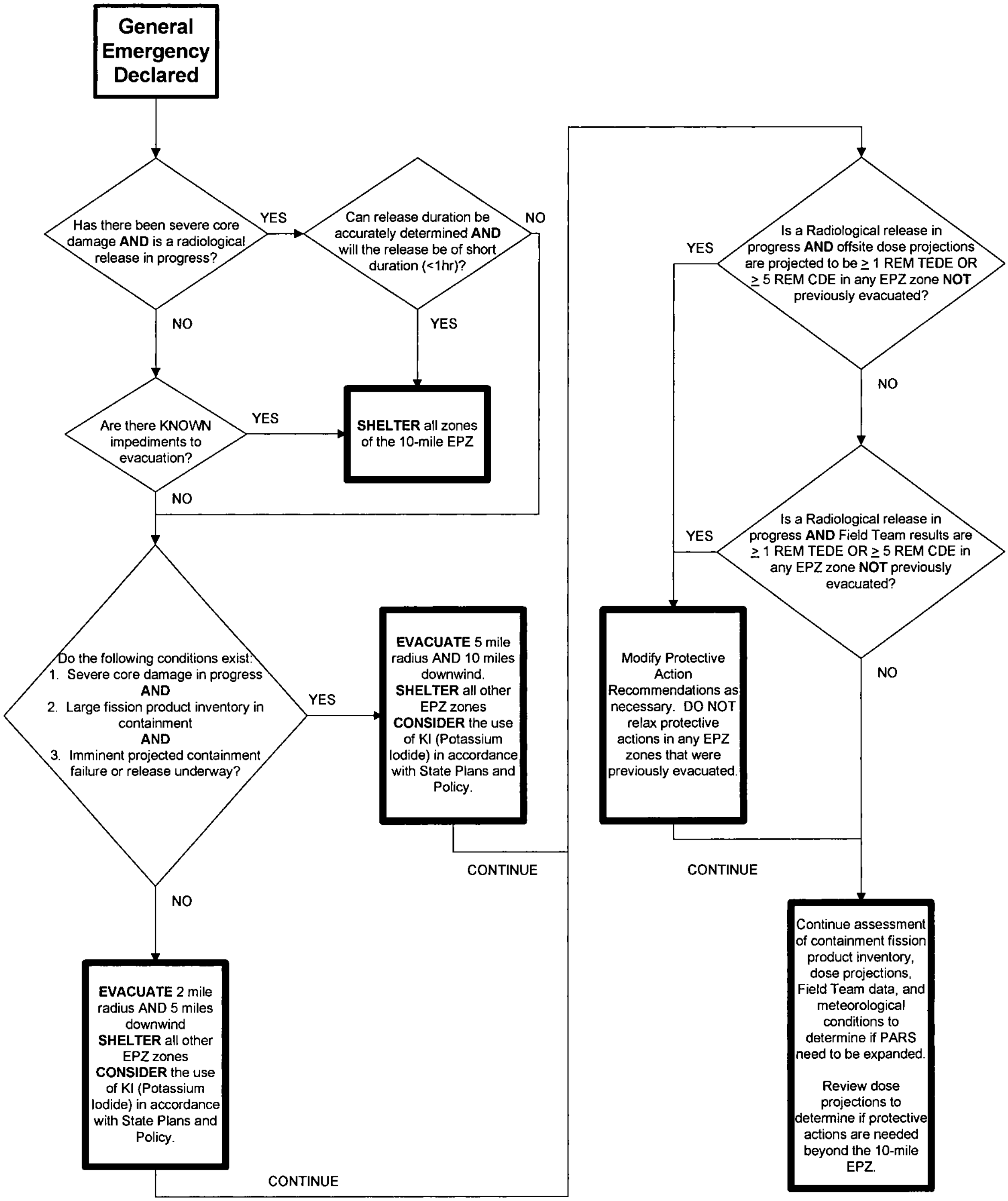


Figure J-2: PAR Flowchart

Section K: Radiological Exposure Control

This section of the plan describes the means for controlling emergency worker radiological exposures during an emergency, as well as the measures that are used by VCSNS to provide necessary assistance to persons injured or exposed to radiation and/or radioactive materials. Exposure guidelines in this section are consistent with EPA Emergency Worker and Lifesaving Activity PAGs described in EPA 400-R-92-001 (EPA-400).

1. Emergency Exposure Guidelines

Being licensed by the NRC, VCSNS maintains personnel exposure control programs in accordance with 10 CFR 20 under normal operating conditions. The ED is assigned the non-delegable responsibility for authorizing personnel exposure levels under emergency conditions in compliance with EPA-400. In emergency situations, workers may receive exposure under a variety of circumstances in order to ensure the safety and protection of others and of valuable property. These exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected. The Emergency Worker Dose Limits are as follows:

Dose Limit (Rem TEDE)	Activity	Condition
0-5	All	Personnel should be kept within normal 10 CFR 20 limits during bona fide emergencies, except as authorized for activities as indicated below.
5-10	Protecting valuable property	Lower dose not practicable.
10-25	Lifesaving or protection of large populations	Lower dose not practicable.
> 25	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved.

Limit dose to the lens of the eye to 3 times the above values and doses to any other organ (including skin and body extremities) to 10 times the above values.

Whenever possible, the concurrence of the Radiological Assessment Supervisor should be secured before exposing individuals to dose equivalents beyond the EPA-400 lower limit.

2. Emergency Radiation Protection Program

The Radiological Assessment Supervisor is the individual responsible for implementing the radiation protection actions during an emergency. Radiation protection guidelines include the following:

- Volunteers over 45 years of age are considered first for any emergency response action requiring exposure greater than normal limits. Routine dose limits shall not be extended to emergency dose limits for declared pregnant individuals. As in the case of normal occupational exposure, doses received under emergency conditions should be maintained as low as reasonably achievable.

- Persons undertaking any emergency operation in which the dose will exceed 25 Rem TEDE should do so only on a voluntary basis and with full awareness of the risks involved including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effects.

- In the context of the emergency limits, exposure of workers that is incurred for the protection of large populations may be considered justified for situations in which the collective dose avoided by the emergency operation is significantly larger than that incurred by the workers involved.

- Exposure accountability is maintained and proper personnel radiological monitoring equipment is provided for all personnel during emergency conditions.

- Access to high radiation areas is only permitted with prior approval of the applicable Radiological Assessment Supervisor. Personnel are not allowed to enter known or potential high radiation areas unless their exposure has been properly evaluated.

- Periodic habitability surveys of emergency facilities are performed during an emergency. If the facility is determined to be uninhabitable, the facility is evacuated in order to prevent or minimize exposure to radiation and radioactive materials. Alternate assembly areas are established, as necessary, to relocate and monitor evacuated personnel.

3. Personnel Monitoring

a. Emergency workers will receive TLD badges and personal self-reading dosimeters capable of measuring expected exposures on a real time basis. The capability exists for the emergency processing of TLDs on a 24-hour per day basis, if necessary.

b. Emergency worker dose records are maintained by Health Physics (as appropriate) in accordance with the emergency and radiological protection procedures. Emergency workers are instructed to read their dosimeters frequently. TLDs may be processed with increased periodicity.

4. Non-V. C. Summer Personnel Exposure Authorization

The responsibility for authorizing non-VCSNS emergency workers (i.e., state and local agency emergency workers) to receive exposures in excess of the EPA-400 General Public PAGs rests with the state and county organizations, except when such emergency workers are onsite. Authorization of exposures in excess of EPA General Public PAGs, in this latter instance, rests with the ED.

5. Contamination and Decontamination

During an emergency, the ED is responsible for preventing or minimizing personnel exposure to radioactive materials deposited on the ground or other surfaces inside the Protected Areas. Special consideration should be given to setting up contamination control arrangements for personnel entering the OSC after completion of assigned activities. The OEM is responsible for preventing or minimizing personnel exposure to radioactive materials deposited on the ground or other surfaces beyond the Protected Areas to the Owner Controlled Area. The OEM is also responsible for the VCSNS Field Team members that are assigned to track and sample the release plume.

a. During emergency conditions, normal plant contamination control criteria will be adhered to as much as possible. However, these limits may be modified by the ORMC in accordance with existing radiation protection procedures, should conditions warrant.

b. Contamination Control Means: Personnel found to be contaminated will normally be attended to at decontamination areas located onsite. The decontamination facility consists of a men's and women's showers, toilet, locker room, and change areas. Temporary decontamination areas can also be set up inside at various locations. Decontamination showers and supplies are provided onsite with additional personnel decontamination equipment and capabilities. Shower and sink drains in the Radiation Controlled Area are routed to the miscellaneous waste processing system where the liquid is processed and monitored prior to discharge. Potentially contaminated emergency vehicles will be surveyed before they are allowed to leave the plant or offsite assembly area. If the survey area is not suitable for monitoring and decontamination due to radiological or other concerns, vehicles will be surveyed at an alternate location.

6. Contamination Control Measures

Controls are established and maintained 24 hours per day to contain the spread of loose surface radioactive contamination.

a. Contaminated Areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel leaving Contaminated Areas are monitored to ensure that they and their clothing are not contaminated. If contamination above acceptable levels is found, they will be decontaminated in accordance with plant procedures. If normal decontamination procedures do not reduce personnel contamination to acceptable levels, the case will be referred to a competent medical authority. Supplies, instruments, and equipment that are in Contaminated Areas or have been brought into Contaminated Areas will be monitored before removal. If personnel are found to be contaminated, they will be decontaminated using normal plant decontamination techniques and facilities. Contaminated materials will be disposed of as radwaste. Contaminated vehicles will be decontaminated before being released. An ambulance responding and transporting injured contaminated personnel will be monitored and decontaminated before departing the medical facility by VCSNS personnel or sent to the county emergency worker decon facility, during a declared emergency.

b. Measures will be taken to control onsite access to potentially contaminated potable water and food supplies. Under emergency conditions, when uncontrolled releases of activity have occurred, eating, drinking, and chewing are prohibited in all onsite VCSNS ERFs until such time as habitability surveys indicate that such activities are permissible.

c. Restricted areas and contaminated items will be returned to normal use when contamination levels have been returned to acceptable levels. Contamination control criteria for returning areas and items to normal use are contained in the plant procedures.

7. Decontamination of Relocated Personnel

Efforts will be made to prevent contaminated vehicles operated by nonessential personnel to depart the VCSNS site. Alternate forms of transportation will be made available to reduce the possibilities of transporting contamination offsite with suspected contaminated vehicles.

Nonessential onsite personnel may be evacuated to an offsite holding area or assembly area, as discussed in Section J. Radiological controls personnel at that location monitor evacuees and determine the need for decontamination. Existing and temporary facilities to limit contamination and exposure will be used and established at the site as necessary during an emergency situation. In the event that decontamination of site evacuees locally is not possible, personnel will be sent to designated locations for monitoring and decontamination. Provisions for extra clothing are made and suitable decontaminates are available for the expected types of contaminations, particularly with regards to skin contaminations.

Section L: Medical and Public Health Support

This section describes the arrangements for medical services for contaminated injured individuals at the station.

1. Offsite Hospital and Medical Service Facilities

Arrangements, by letter of agreement, are maintained by SCE&G with Palmetto Health Richland Hospital for receiving and treating contaminated or exposed persons with injuries requiring immediate medical care. Hospital personnel have been trained and the hospital is equipped to handle contaminated or radiation injured individuals. Specifically, training of medical support personnel at Palmetto Richland Hospital includes basic training on the nature of radiological emergencies, diagnosis and treatment, and follow-up medical care. Station personnel are available to assist medical personnel with decontamination, radiation exposure and contamination control. Materials that are identified as contaminated are collected by Health Physics personnel and returned to VCSNS for decontamination or disposal.

Because of the specialized nature of the diagnosis and treatment of radiation injuries, VCSNS maintains an agreement with the REAC/TS in Oak Ridge, Tennessee. REAC/TS will provide a backup response capability for patients with serious contamination/ingestion or who have been excessively exposed to radiation. REAC/TS has a radiological emergency response team of physicians, nurses, Health Physicists, and necessary support personnel on 24-hour call to provide consultative or direct medical or radiological assistance. Specifically, the REAC/TS team has expertise and is equipped to conduct: medical and radiological triage; decontamination procedures and therapies for external contamination and internally deposited radionuclides, including chelation therapy; diagnostic and prognostic assessments or radiation-induced injuries; and radiation dose estimates by methods that include cytogenetic analysis, bioassay, and in vivo counting.

Victims of accidents or medical emergencies who are determined as not being contaminated or excessively exposed to radiation may be treated at the closest appropriate medical facility as determined by the responding Emergency Medical Services Crew Chief.

2. Onsite First Aid Capability

The station maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. In general, physicians or nurses are not staffed at VCSNS, and as such, medical treatment given to injured persons is of a "first response" nature. The Medical Emergency Response Team (MERT) is comprised of on-shift personnel trained as First Responders. The MERT is dispatched by the Control Room or the OSC when it is activated. At least two of these individuals are available on shift at all times to support immediate response in the Protected Areas. VCSNS also maintains an agreement with a local physician. That physician serves as the VCSNS's company physician and is available to respond to the site to augment medical treatment as required.

Additionally, the Health Physics Specialists at VCSNS are experienced and trained in the control of radioactive contamination and decontamination work for injured or ill personnel. Health Physics Specialists are dispatched to support the MERT if there is a possibility of contamination associated with the injury/illness. The functions of station personnel in handling onsite injured people are:

a. Afford rescue

b. Administer first responder aid including such resuscitative measures as are deemed necessary

c. Request and escort offsite medical assistance to the injured/ill individual in a timely manner when needed

d. Begin decontamination procedures as appropriate

e. Arrange for suitable transportation to a hospital when required

Primary attention shall be directed to the actual factors involved in the treatment of injuries or illness, such as: control of bleeding, resuscitation including heart and lung, control of bleeding after resuscitation, protection of wounds from bacterial or radioactive contamination and the immobilization of fractures.

VCSNS personnel provide an initial estimate of the magnitude of surface contamination of the injured and preliminary estimates of total body dose to the injured. Primary rapid and simple decontamination of the surface of the body (when possible and advisable) before transportation to a designated hospital may be carried out. This activity would be as directed or performed by Health Physics personnel. If decontamination is not considered due to the immediacy of medical treatment, efforts will be made to isolate and reduce the spread of the contamination before transportation. When additional professional medical care is needed and contamination is not a factor, injured or ill persons are transported to a local clinic or hospital. Contaminated and injured or ill persons are transported to Palmetto Health Richland Hospital from the VCSNS site.

First aid facilities at VCSNS are designed to provide basic first responder aid to injured or ill personnel before arrival of offsite medical support. First aid facilities are located in each of the units and are described in the appropriate Unit Annex to this Plan. Medical equipment and supplies are available at these locations.

In the event of a mass casualty incident, medical triage is implemented. MERT members are trained for medical triage using START (Simple Triage and Rapid Treatment) or other similar principals. Each victim is screened and categorized in order to prioritize victim treatment. In the event that station and local response resources are exceeded by the number of casualties, the South Carolina Emergency Operations Plan is implemented to acquire additional resources by the offsite response agencies.

3. Medical Transportation

In situations when transportation of a victim(s) to a hospital is required, arrangements are made by the station for prompt ambulance transport of persons with injuries and/or illness involving radioactivity to Palmetto Richland Hospital. Such service is available on a 24-hour per day basis and is confirmed by letter of agreement with the Fairfield County Emergency Medical Services (FCEMS). The FCEMS is located approximately two miles from VCSNS and is staffed with Emergency Medical Technicians, Paramedics, and additional qualified personnel capable of handling medical emergency situations. VCSNS maintains a communications link with the FCEMS by means of an ESSX telephone, radio and normal telephone lines. VCSNS security personnel will expedite and escort the responding ambulance(s) to the victim's location.

In the event that a helicopter is requested by the response personnel to transport victim(s) to appropriate medical care, a primary helicopter landing zone is available onsite for use. Alternate landing zones are determined by response personnel and marked to assist the landing of the helicopter.

If additional assistance is required for the transportation of accident victims, the Lexington County Emergency Medical Services (LCEMS) will respond. This support would most likely be used in a case where multiple casualty victims would require transportation to offsite medical facilities. LCEMS is located approximately 15 miles from VCSNS and is staffed with Emergency Medical Technicians and Paramedics. Should the need arise, assistance from the LCEMS and other response organizations would be requested by FCEMS or the Incident Commander.

Radiation monitoring services shall be provided by VCSNS Health Physics personnel whenever it becomes necessary to use the ambulance service for the transportation of contaminated persons.

A qualified Health Physics person shall accompany the ambulance to the hospital upon the determination that the injured or ill person is contaminated or if the determination cannot be made that the individual is free of surface contamination. Additional Health Physics personnel may be contacted and dispatched to Palmetto Health Richland Hospital to assist in the monitoring and decontamination of the injured victim(s), the hospital facilities, and the ambulance and response personnel as needed.

Section M: Reentry and Recovery Planning

This section describes the measures to be taken for reentry into the areas of the Station which have been evacuated as a result of an accident. It also outlines the VCSNS Recovery Organization and its concepts of operation.

1. Reentry and Recovery

a. Evaluating Reentry Conditions

During an emergency, immediate actions are directed toward limiting the consequences of the accident to afford maximum protection to station personnel and the general public. Once corrective measures have been taken and effective control of the plant has been reestablished, a more methodical approach to reentry is taken. This Emergency Plan divides reentry into two separate categories:

- Reentry *during the emergency phase of an accident* is performed to save a life, control a release of radioactive material, prevent further damage to plant equipment or restore plant equipment. If necessary, this category of reentry may be performed using emergency exposure limits. Briefings, rather than written radiation protection procedures, may be used when making these entries.

  All reentry activities conducted during the emergency are authorized by the ED and coordinated by the OSC Supervisor and the Radiological Assessment Supervisor.

- Reentry *during the recovery phase of an accident* is performed using normal exposure limits. Either normal procedures or procedures that consider existing as well as potential conditions inside affected areas are developed specifically for each reentry.

  Reentry activities during the recovery phase are authorized by the Recovery Director and coordinated by the recovery organization managers in charge of personnel making the reentry.

The following items are considered when planning for any reentry:

- Review of available radiation surveillance data to determine plant areas potentially affected by radiation and/or contamination

- Review of radiation exposure history of personnel required to participate in the accident mitigation or recovery operations

- Determination of the need for additional personnel and the sources of these additional personnel

- Review of adequacy of radiation survey instrumentation and equipment (types, ranges number, calibration, etc.)

- Review of nonradiological hazards and required protective measures (e.g., fire, electrical, atmosphere, Hazmat)

- Preplanning of activities and briefings for the reentry team that include the following:
  - Personnel knowledge requirements
  - Methods and procedures that will be employed during the entry
  - Specific tasks to be performed
  - Anticipated radiation and contamination levels as well as "turn back" limits
  - Radiation survey equipment and types and ranges of dosimetry required
  - Shielding requirements and availability
  - Appropriate communications
  - Personal protective equipment (PPE) requirements
  - Access control procedures
  - Decontamination requirements
  - Debriefing requirements
  - Respiratory protection
- A review of security controls to prevent unauthorized or unintentional entry into hazardous or secured areas.

b. Evaluating Entry into Recovery

The Recovery Phase is that period when major repairs are being performed to return the plant to an acceptable condition and the possibility of the emergency condition degrading no longer exists. Once the plant has been stabilized, contained, and controlled, the Recovery Phase may be entered. It is the responsibility of the ED to declare emergency phase terminated and entry into Recovery after obtaining concurrence from the ED and consulting with offsite authorities if a Site Area Emergency or General Emergency has been declared.

Establishment of Recovery can be conducted from any emergency classification level. However, it is possible that the lower classifications of Unusual Event and Alert will conclude with the overall event being terminated. There may be cases where certain EAL ICs remain exceeded, but the station is under control and no further danger of degradation exists. In such a case, it may be appropriate to enter Recovery. Site Area Emergency and General Emergency classifications will require a Recovery Phase to be established before event termination. VCSNS may consult with/notify the cognizant governmental agencies before declaring Recovery or event termination during an Unusual Event or Alert. When in a Site Area Emergency or a General Emergency, VCSNS will consult and notify the cognizant governmental agencies before declaring Recovery or event termination.

Termination/Recovery considerations are contained in the implementing procedures to provide guidance for evaluating the risk of entering Recovery without alleviating the intent of the Initiating Condition. The purpose of Recovery is to provide the necessary personnel to affect the long-term activities and to return the plant to an acceptable condition.

The following conditions are guidelines for the determination of establishing Recovery (this is not intended to be a complete list and additional criteria may apply, depending on the specifics of the event):

- The risk to the health and safety of the public has been mitigated
- Plant parameters and equipment status have been established and controlled
- In-plant radiation levels are stable or decreasing, and acceptable, given the plant conditions
- The potential for uncontrolled releases of radioactive material to the environment has been eliminated
- Environmental monitoring has been established
- The radioactive plume has dissipated and plume tracking is no longer required (the only environmental assessment activities in progress are those necessary to assess the extent of deposition resulting from passage of the plume)
- VCSNS workers have been protected
- Any security threat has been neutralized, and/or plant Security is under the direction of VCSNS personnel as part of a Unified Command Incident Command System
- *Adequate plant safety systems are operable*
- The reactor is in a stable shutdown condition and long-term core cooling is available
- The fuel pool damage has been mitigated, or spent fuel damage has been contained and controlled
- Primary and/or secondary containment integrity has been established
- Plant systems and equipment are restored and/or replaced such that plant conditions are stable and highly unlikely to degrade further
- Conditions that initiated the emergency have been contained, controlled, eliminated, or stabilized such that the emergency classification is no longer applicable
- The operability and integrity of unit or externally supplied radioactive waste systems, decontamination facilities, power supplies, electrical equipment and of plant instrumentation including radiation monitoring equipment
- Any fire, flood, earthquake, high winds, or similar emergency condition or security threat no longer exists
- All required notifications have been made

- Discussions have been held with federal, state, and county agencies and agreement has been reached to terminate the emergency for a Site Area Emergency or a General Emergency

- At an Alert or higher classification, the ERO is in place and emergency facilities are activated

- All contaminated injured personnel have been treated and/or transported to a medical care facility

- Offsite conditions do not unreasonably limit access of outside support to the station and qualified personnel and support services are available

It is not necessary that all conditions listed above be met; however, all items must be considered before entering the recovery phase. For example, it is possible after a severe accident that some conditions remain that exceed an Emergency Action Level, but entry into the Recovery Phase is appropriate.

2. Recovery Organization

Once plant conditions have been stabilized and the Recovery Phase has been initiated, the ECO with assistance from senior management may form a Recovery Organization for long-term operations. These types of alterations should be discussed with the NRC before they are implemented.

- For events of a minor nature, (i.e., for Unusual Event classifications), the normal on shift organization is normally adequate to perform necessary recovery actions.

- For events where damage to the plant has been significant, but no offsite releases have occurred and/or protective actions were not performed, (i.e., for Alert classifications) the station ERO, or portions thereof, should be adequate to perform the recovery tasks before returning to the normal station organization.

- For events involving major damage to systems required to maintain safe shutdown of the plant and/or offsite radioactive releases have occurred, (i.e., for Site Area Emergency or General Emergency classifications) the station recovery organization is put in place.

The specific members of the station recovery organization are selected based on the sequence of events that preceded the recovery activities as well as the requirements of the recovery phase. The basic framework of the station recovery organization is as follows:

a. The Recovery Director: The ECO is initially designated as the Recovery Director. The Recovery Director is charged with the responsibility for directing the activities of the station recovery organization. These responsibilities include:

   - Ensuring sufficient personnel, equipment, or other resources from SCE&G and other organizations are available to support recovery

   - Directing the development of a recovery plan and procedures

- Deactivating any of the plant ERO that was retained to aid in recovery, in the appropriate manner. Depending on the type of accident and the onsite and offsite affects of the accident, portions of the ERO may remain in place after initiation of the recovery phase.

- Coordinating the integration of available federal and state assistance into onsite recovery activities

- Coordinating the integration of SCE&G support with federal, state, and county authorities into required offsite recovery activities

- Approving information released by the public information organization that pertains to the emergency or the recovery phase of the accident

- Determining when the recovery phase is terminated

b. The Recovery Plant Manager: The General Manager, Nuclear Plant Operations or a designated alternate, will become the Recovery Plant Manager. The Recovery Plant Manager reports to the Recovery Director and is responsible for:

- Coordinating the development and implementation of the recovery plan and procedures

- Ensuring that adequate engineering activities to restore the plant are properly reviewed and approved

- Directing all onsite activities in support of the station recovery effort

- Designating other VCSNS recovery positions required in support of onsite recovery activities

c. The Recovery Offsite Manager: A senior member of Nuclear Support Services or a designated alternate is the Recovery Offsite Manager. The Recovery Offsite Manager reports to the Recovery Director and is responsible for:

- Providing liaison with offsite agencies and coordinating VCSNS assistance for offsite recovery activities

- Coordinating VCSNS ingestion exposure pathway EPZ sampling activities and the development of an offsite accident analysis report

- Developing a radiological release report

- Designating other VCSNS recovery positions required in support of offsite recovery activities

d. The Company Spokesperson: A senior SCANA Public Relations Group individual is designated as the Company Spokesperson. The Company Spokesperson reports to the Recovery Director and is responsible for:

- Functioning as the official spokesperson to the press for SCE&G on all matters relating to the accident or recovery
- Coordinating with all public information groups (federal, state, county, etc.)
- Coordinating media monitoring and rumor control
- Determining what public information portions of the ERO will remain activated

The remainder of the recovery organization is established on an initial recovery plan developed at the end of the emergency phase or just after entry into the Recovery Phase. Consideration is given to recovery activity needs and use of the normal station organizations. Individual recovery supervisors may be designated in any or all of the following areas:

- Training
- Health Physics
- Chemistry
- Technical/Engineering Support
- Nuclear Oversight
- Operations
- Security
- Maintenance
- Corporate Support
- Special Offsite Areas (Community Representatives, Environmental Samples, Investigations, etc.)

3. Recovery Phase Notifications

When the decision is made to enter the Recovery Phase, all members of the ERO are informed of the change. All VCSNS personnel are instructed on the Recovery Organization and their responsibilities during the recovery effort. The offsite authorities are notified of the shift to and the basic structure and management of the Recovery Organization.

4. Total Population Exposure

Total population exposure calculations are performed and periodically updated during the Recovery Phase of an accident. A procedure has been developed for estimating the total population exposure resulting from the accident from data collected in cooperation with the state and other federal agencies. Total population exposure is determined through a variety of processes including:

- Examination of prepositioned environment monitoring TLDs
- Bioassay
- Estimates based on release rates and meteorology
- Estimates based on environmental monitoring of food, water, and ambient dose rates

The state will be the lead agency in the collection and analysis of environmental air, soil, foliage, food, and water samples and for the generation of radiation monitoring reports. VCSNS environmental sampling activities will be coordinated with state efforts, as requested, and results shared with the cognizant agencies.

Section N: Drill and Exercise Program

This section describes the Drill and Exercise Program that VCSNS has implemented to:

- Verify the adequacy of the Emergency Preparedness Program
- Develop, maintain, and evaluate the capabilities of the ERO to respond to emergency conditions and safeguard the health and safety of station personnel and the general public
- Identify deficiencies in the Emergency Plan and its associated procedures, or in the training of response personnel, and ensure that they are promptly corrected
- Identify deficiencies in the relationship between the Emergency Plan and the VCSNS Security Plan and ensure that they are promptly corrected.
- Ensure the continued adequacy of emergency facilities, supplies, and equipment, including communications networks

1. Exercises

Exercises provide an opportunity to evaluate the ability of participating organizations to implement a coordinated response to postulated emergency conditions. Provisions will be made for qualified personnel from VCSNS, other commercial nuclear facilities, or federal, state, or local governments to observe and critique each exercise as appropriate. Exercises are conducted to ensure that all major elements of the emergency plan and preparedness program are demonstrated at least once in each exercise cycle. Each scenario variation shall be demonstrated at least once during the cycle and shall include, but not limited to, the following:

- An off-hours exercise between 6:00 p.m. and 4:00 a.m.. Weekends and holidays are also considered off-hour periods
- Hostile action directed at the plant site involving the integration of offsite resources with onsite response; VCS participates on a rotating basis with other fixed nuclear facilities in the state of South Carolina
- An initial classification of, or rapid escalation to, Site Area Emergency or General Emergency
- No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of General Emergency
- An ingestion pathway exercise ; VCSNS participates on a rotating basis with the other fixed nuclear facilities in the state of South Carolina

a. Biennial Exercises

Federally prescribed exercises are conducted at the station in order to test the adequacy of timing and content of implementing procedures and methods; to test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties. Exercises involving offsite agency participation, required under Sections F.2.b., F.2.c., & F.2.d. to 10 CFR 50 Appendix E, are conducted at the station based on FEMA guidance and the respective state and county emergency response plans.

Full participation exercises will include appropriate offsite local and state authorities and VCSNS personnel physically and actively taking part in testing the integrated capability to adequately assess and respond to a declared emergency at the station. Additionally, full participation exercises will include testing the major observable portions of the onsite and offsite emergency plans and mobilization of state, local, and VCSNS personnel and other resources in sufficient numbers to verify the capability to respond to the accident scenario. Some of the offsite response actions may be provided for evaluation in an out-of-sequence manner. These exercises are to be scheduled in an attempt to provide or simulate various weather conditions.

These exercises are usually conducted in conjunction with a full participation exercise as the state chooses.

Where full participation by offsite agencies occurs, the sequence of events simulates an emergency that may result in the release of radioactivity to the offsite environs or the threat of such a release, sufficient in magnitude to warrant a response by offsite authorities. The sequence of events will be submitted to the NRC and FEMA in a timely fashion to ensure that the scenario is judged to provide adequate opportunity for demonstration of the agreed upon objectives and extent of play.

In the event of an inadequate demonstration of the offsite response, VCSNS will participate and support the conduct of activities that are designed to address the deficient or weak demonstrations.

b. Off-Year Exercises

An Off-Year Exercise is conducted at the station during the calendar year when an NRC Evaluated Exercise is not scheduled. An Off-Year Exercise shall involve the station and its facilities in order to demonstrate at least the functions of management and coordination of emergency response, accident assessment, protective action decision-making, or plant system repair and corrective actions. Off-Year Exercises involve no or limited participation by offsite agencies, although a routine offer is made to determine the extent of participation by the offsite authorities. Emphasis is placed on development and conduct of an exercise that is more mechanically and operationally realistic. Players may be able, by implementing appropriate procedures and corrective actions, to determine the outcome of the scenario to a greater extent than when core damage and the release of radioactivity that are prerequisites for demonstration of all objectives which may include security response activities.

2. Drills

In addition to the exercises described above, VCSNS conducts drills for the purpose of testing, developing, and maintaining the proficiency of emergency responders. Drills are scheduled on the Emergency Preparedness annual events plan, which contains provisions for the following drills:

a. Training Drills

Training Drills may be conducted before a Biennial Exercise where FEMA evaluation of state and local performance is expected. Training Drills may be conducted before Off-Year Exercises that only involve VCSNS. The Training Drill is a training and experience tool for the participants to sharpen awareness and practice skills necessary to accomplish specific Emergency Plan duties and responsibilities. It also provides a "dry run" for experience dealing with multiple Controllers, Observers and Evaluators that may be in excess of those provided in training drills.

b. Communication Drills

- Monthly: The primary and alternate methods to notify the state and local government warning points and EOCs within the plume exposure pathway EPZ are demonstrated. Also, the capability to notify the NRC is demonstrated using the ENS.

- Quarterly: The capability to notify the NRC Region and federal EROs as listed in the Emergency Telephone Directory are demonstrated from the EOF. Also, computer and critical communications equipment shall be functionally tested.

- Annually: The emergency communications systems outlined in Section F are fully tested. This includes (1) communications between the plant and the state and local EOCs and Field Teams, (2) communications between the Control Rooms, the TSC, and the EOF (3) communications between the TSC and the OSCs, and (4) communications between the EOF and the JIC.

Each of these drills includes provisions to ensure that all participants in the test are able to understand the content of the messages.

c. Fire Drills: Fire drills shall be conducted in accordance with the station Technical Specifications, Fire Protection Plan, and/or station procedures.

d. Medical Emergency Drills: A medical emergency drill, involving a simulated contaminated individual and containing provisions for participation by local support services organizations (i.e., ambulance and support hospital) is conducted annually. The offsite portions of the medical drill may be performed as part of the required biennial exercise.

e. Radiological Monitoring Drills: Plant environs and radiological monitoring drills (onsite and offsite) are conducted annually. These drills include collection and analysis of all sample media (such as, water, vegetation, soil, and air), and provisions for communications and record keeping. Collection of milk is demonstrated in accordance with the ingestion pathway exercises.

f. Health Physics Drills: Health Physics drills involving a response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements within the plant are conducted semiannually in each Protected Area.

g. Augmentation Drills: Augmentation drills serve to demonstrate the capability of the process to augment the on-shift staff with a TSC, OSCs, EOF, and JIC after declaration of an emergency. These drills are conducted using the following methods:

- Semiannually, an unannounced off-hours ERO augmentation drill where no actual travel is required
- At least once per exercise cycle, an off-hours unannounced activation of the ERO Notification System with actual response to the emergency facilities is conducted to support the response of the ERO

h. Accountability Drills: Accountability drills are conducted annually for each Protected Area. The drill includes ascertaining the names of all missing individuals within that protected area and accounting for all individuals within the Protected Area continuously throughout the event.

3. Conduct of Drills and Exercises

Advance knowledge of the scenario will be kept to a minimum to allow "free-play" decision making and to ensure realistic participation by those involved. Before the drill or exercise, a package will be distributed to the Controllers and Evaluators that will include the scenario, a list of performance objectives, and a description of the expected responses.

Drills will be provided to ensure that each member of the ERO will have an opportunity to participate in a drill in their assigned facility at least once in a two-year period. Drills will be rotated among the Units and their specific ERFs to provide the needed opportunities for the members of the ERO.

For each emergency preparedness exercise or drill conducted, a scenario package is developed that includes at least the following:

a. The basic objective(s) of the drill or exercise and the appropriate evaluation criteria

b. The date(s), time period, place(s), and participating organizations

c. The simulated events

d. A list of anticipated Drill/Exercise Performance (DEP) opportunities including classification, notifications and PARs

e. A time schedule of real and simulated initiating events

f. A narrative summary describing the conduct of the scenario to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities

g. A list of qualified participants

h. Instructions for the conduct of the drill/exercise for the controller organization

Prior approval by the appropriate Station Management is obtained for all drills and exercises conducted in support of the Emergency Preparedness Program.

4. Critique and Evaluation

Drill and exercise performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each drill or exercise, a critique is conducted to evaluate the ability of the ERO to implement the Emergency Plan and its implementing procedures.

A formal written critique report is prepared by the Manager, Emergency Planning following a drill or exercise involving the evaluation of designated objectives or following the final simulator session with ERO participation. The report will evaluate the ability of the ERO to respond to a simulated emergency situation or sequence of events. The report will also contain corrective actions and recommendations for improvement.

Biennially, representatives from the NRC observe and evaluate the licensee's ability to conduct an adequate self-critical critique. For full offsite participation exercises, both the NRC and FEMA will observe, evaluate, and critique.

Critique comments identified by participants during a training drill where objectives are not formally being evaluated will be reviewed and dispositioned by the Emergency Preparedness Unit, but are not required to be included in a formal report.

5. Resolution of Drill and Exercise Findings

The critique and evaluation process is used to identify areas of the Emergency Preparedness Program that require improvement. The Manager, Emergency Planning is responsible for evaluation of recommendations and comments to determine which items will be incorporated into the program or require corrective actions, and for the scheduling, tracking, and evaluation of the resolution to the items.

Whenever exercises and/or drills indicate deficiencies in the Emergency Plan or corresponding implementing procedures, such documents will be revised as necessary.

Section O: Emergency Response Training

This section describes the emergency response training that is provided to those who may be called upon in an emergency. It outlines the training provided by VCSNS to both its employees and offsite support personnel requiring site access.

1. Assurance of Training

The Emergency Plan Training Program assures the training, qualification, and requalification of individuals who may be called on for assistance during an emergency. Specific emergency response task training, prepared for each Emergency Plan position, is described in lesson plans and study guides. The lesson plans, study guides, and written tests are contained in the ERO Training Program. Responsibilities for implementing the training program are contained in plant procedures. A description of the content of the training courses is given in the VC Summer Training and Qualification Procedures (TQP).

Offsite training is provided to support organizations that may be called upon to provide assistance in the event of an emergency. The following outlines the training received by these organizations:

a. Emergency Preparedness shall annually train, or document an annual written offer to train, those non-VCSNS organizations that may provide specialized services during a nuclear plant emergency (e.g., local law enforcement, firefighting, medical services, transport of injured, etc.). The training made available is designed to acquaint the participants with the special problems potentially encountered during a nuclear plant emergency, notification procedures and their expected roles. Those organizations that must enter the site shall also receive site-specific emergency response training and be instructed as to the identity (by position and title) of those persons in the onsite organization who will control their support activities.

b. Training of offsite EROs is described in their respective radiological emergency plans, with support provided by VCSNS as requested.

2. Functional Training of the ERO

In addition to general and specialized classroom training, members of the ERO receive periodic performance-based emergency response training. Performance-based training is provided using one or more of the following methods:

- Familiarization Sessions: A familiarization session is an informal, organized tabletop discussion of predetermined objectives.
- Walk-throughs: Consists of a facility walk-through to familiarize plant ERO personnel with procedures, communications equipment, and facility layout. Walk-throughs also provide the opportunity to discuss facility activities, responsibilities, and procedures with an instructor.
- Drills: A drill is a supervised instruction period aimed at testing, developing, and maintaining skills in a particular operation. Drills described in Section N of this plan are a part of training. These drills allow each individual to demonstrate the ability to perform their assigned emergency functions. During drills, on-the-spot correction of erroneous

performance may be made and a demonstration of the proper performance offered by the Controller.

3. First Aid Response

Selected station personnel are trained in accordance with the VCSNS approved First Aid Program and medical triage. MERTs will likely be augmented with additional personnel such as fire brigade members and other personnel qualified to assist in the rescue.

4. Emergency Response Organization Training Program

ERO personnel who are responsible for implementing this plan receive specialized training. The training program for emergency response personnel is developed based on the requirements of 10 CFR 50, Appendix E and position specific responsibilities as defined in this document.

On-shift emergency response personnel perform emergency response activities as an extension of their normal duties and are trained annually as part of their duty specific training. Additional Emergency Preparedness information is provided as part of the Station Orientation Training (SOT).

New ERO personnel receive an initial overview course that familiarizes them with the Emergency Plan by providing basic information in the following areas as well as specific information as delineated in the sections below:

- Planning Basis
- Emergency Classifications
- ERO and Responsibilities
- Call-out of ERO
- ERFs
- Communications Protocol/EPIO
- Offsite Organizations

Emergency response personnel in the following categories receive knowledge and/or performance based training initially and retraining thereafter on an annual basis:

a. <u>Directors, Managers, Supervisors, and selected Coordinators within the Station ERO</u>: Personnel identified by the Emergency Planning Telephone Directory as Directors, Managers, Supervisors, and Coordinators for the Station ERO receive training appropriate to their position in accordance with the approved ERO training program. These personnel receive specialized training in the areas of:

   - Notifications
   - Emergency Classifications

- Protective Action Recommendations
- Emergency Action Levels
- Emergency Exposure Control

The ECOs and EDs along with selected managers, coordinators, and IEDs receive training in accordance with the approved ERO training program. Training in accident assessment sufficient to classify an event and to mitigate the consequences of an event is also covered.

b. Personnel Responsible for Accident Assessment: The skills and knowledge required to perform plant stabilization and mitigation are a normal function of operations-specific positions, as identified in Section B of this Plan. Power changes and planned and unplanned reactor shutdowns are handled on a normal operation basis. Subsequent plant stabilization and restoration is pursued using normal operating procedures. Licensed operators receive routine classroom and simulator training to ensure proficiency in this area.

1) Active Senior Licensed Control Room Personnel shall have training conducted in accordance with the approved ERO training program such that proficiency is maintained on the topics listed below. These subjects shall be covered as a minimum on an annual basis.

- Event Classification
- Protective Action Recommendations
- Radioactive Release Rate Determination
- Notification form completion and use of ESSX
- Federal, state and county notification procedures as appropriate
- Site-specific procedures for activating the onsite and offsite ERO

2) Core Damage Assessment Personnel: During an emergency when core/cladding damage is suspected, a specialized group of trained individuals perform core damage assessment. At a minimum, personnel responsible for core damage assessment receive classroom and hands-on training in the following areas:

- Available instrumentation and equipment
- Isotopic assessment and interpretation
- Core damage assessment methodology and/or proceduralized assessment methods

c. Field Teams and Radiological Analysis Personnel

1) Field Radiological Monitoring: Field radiological monitoring is performed by trained individuals who provide samples and direct readings for dose assessment calculations and dose projection comparisons.

Personnel identified as members of Field Teams receive training in accordance with the approved training program. Field Team members receive classroom and hands-on training in the following areas:

- Equipment and equipment checks
- Communications
- Plume tracking techniques

2) Personnel Monitoring: Personnel monitoring is performed by trained individuals who monitor station personnel and their vehicles for contamination during an emergency. Personnel Monitoring Team members receive classroom and hands-on training in the following areas:

- Personnel monitoring equipment and techniques
- Decontamination techniques for personnel
- Decontamination techniques for vehicles

3) Dose Assessment: Dose assessment training includes the skills and knowledge necessary for calculation and interpretation of an offsite release and its impact on the environment under varying meteorological conditions. Individuals responsible for performing dose assessment are trained in the following areas:

- Computerized dose assessment
- Protective Action Recommendations
- Field Team interface
- PAGs associated with offsite plume exposure doses
- Basic meteorology

d. Police, Security, and Firefighting Personnel

1) Local Police and Firefighting Personnel: The local police and fire departments are invited to receive training as outlined in Part 1.a of this section.

2) Security Personnel: Station security personnel are trained in accordance with training defined by the SOT and VCSNS Security Program.

3) Fire Brigade Teams: Station fire brigade members are trained in accordance with training defined by the VCSNS Fire Protection Program.

e. Repair and Damage Control Teams: Operations, Maintenance, Chemistry, and Health Physics personnel are trained as part of their normal job-specific duties to respond to both normal and abnormal plant operations.

Operations personnel are trained to: (1) recognize and to mitigate degrading conditions in the plant, (2) mechanically and electrically isolate damaged or malfunctioning equipment, (3) isolate fluid leaks, and (4) minimize transients.

Maintenance personnel are trained to troubleshoot and repair damaged or malfunctioning electrical, mechanical, or instrumentation systems as appropriate to their job classification.

Chemistry personnel are trained to take system samples and perform appropriate laboratory chemical analysis of the samples.

Health Physics personnel are trained to assess the radiological hazards associated with equipment repair and instruct personnel as to the appropriate protective clothing requirements, respiratory protection requirements, stay times, and other protective actions specific to the conditions present.

At least 50% of personnel from the organizations below, who are potential responders to the OSC as Damage Control Team members, are required to be qualified in the use of respiratory protection equipment. This includes in-plant supervision and craft/technical personnel for the following organizations:

- Operations
- Health Physics
- Chemistry
- Maintenance (Mechanical, Electrical, and I&C)

f. Medical Emergency Response Team and Rescue Personnel: MERT and rescue team members receive training as outlined in Part 3 of this section, First Aid Response.

g. Local Support Service Personnel: Local support service personnel providing assistance during an emergency are invited to receive training as outlined in Parts 1.a and 1.b of this section.

h. Medical Support Personnel: Onsite medical personnel receive specialized training in the handling of contaminated victims and hospital interface. Offsite ambulance and hospital personnel are offered annual training in accordance with a program provided by Emergency Preparedness.

i. EPIO Personnel: Corporate and station personnel responsible for disseminating public information and responding to media and public information requests receive specialized public information training.

j. Communications Personnel: ERO personnel receive training on communications protocol as a part of the initial Emergency Response Overview Course. Personnel using specialized communications equipment that is not part of their normal daily function receive initial and requalification training on the equipment. Personnel involved in notifications to offsite agencies receive specialized training in the notification process.

5. General, Initial, and Annual Training Program Maintenance

a. Station departments and Emergency Preparedness share the responsibility for ensuring that the ERO receives all necessary training and retraining. In order to carry this out, responsibilities are assigned as follows:

Station responsibilities for Station ERO personnel:

- Station management shall ensure the attendance of onsite personnel for training, including required Emergency Planning courses.
- The station shall conduct onsite emergency personnel initial and retraining for station ERO personnel using approved lesson plans.
- The Station Training Department shall provide those shift personnel included in a continuing training program an annual review of the following items as a minimum:
  - Assembly Areas
  - ERF assignment
  - Potential Hazards (radiological and nonradiological)
  - Anticipated actions including assembly requirements, protective equipment requirements (clothing, masks, SCBA, etc.), the use of KI, emergency exposure limits and accountability requirements.

b. Initial and Requalification ERO Training: The proficiency of emergency response personnel (as defined in 10 CFR 50 Appendix E) is ensured by the following means:

- Assigning individuals to emergency duties that are similar to those performed as a part of their regular work assignment or experience.
- Initial training and annual retraining on applicable generic and site-specific portions of the emergency plan and the corresponding implementing procedures. Individuals not demonstrating the required level of knowledge in initial or retraining classes receive additional training on the areas requiring improvement. Annual retraining is conducted on a calendar year basis.
- Training on Emergency Plan changes shall be completed within 120 days of implementation of the change.
- Participation in exercises and/or drills as developed or authorized by the Emergency Preparedness Department and designed to sharpen those skills that they are expected to use in the event of an actual emergency.

All personnel assigned position specific responsibilities in the ERO are documented by inclusion in the Emergency Planning Telephone Directory listing of positions and personnel.

c. Station Orientation Training (SOT): All personnel with unescorted station access are provided with initial orientation training on the notification and instruction methods used in the event of an emergency. Additionally, all badged individuals also receive initial orientation on the basic principles of radiological safety including the effects of radiation and the theory and use of radiation detection devices. Appropriate actions for escorted individuals shall be the responsibility of the escort. SOT provides initial and annual requalification training on the basic elements of the Emergency Plan for all personnel working at the plant. Specifically, these elements include:

- Station emergency alarms and their meaning
- Assembly areas
- Site and exclusion area evacuation procedures
- Special precautions and limitations during an emergency
- Purpose of the Emergency Plan

Section P: Responsibility for the Maintenance of the Planning Effort

This section describes the responsibilities for development, review, and distribution of the Emergency Plan and actions that must be performed to maintain the Emergency Preparedness Program. It also outlines the criteria for ensuring that personnel who perform the planning are properly trained.

1. Emergency Preparedness Staff Training

The Emergency Preparedness staff is involved in maintaining an adequate knowledge of state-of-the-art planning techniques and the latest applications of emergency equipment and supplies. At least once each calendar year, each member of the Emergency Preparedness staff is involved in one of the following activities:

- Training courses specific or related to emergency preparedness
- Observation of or participation in drills and/or exercises at other stations
- Participation in industry review and evaluation programs aimed towards emergency preparedness programs/issues
- Participation in regional or national emergency preparedness seminars, committees, workshops, or forums
- Specific training courses in related areas, such as systems, equipment, operations, radiological protection, or problem identification and resolution

2. Authority for the Emergency Preparedness Effort

The Vice President, Nuclear Operations, is responsible for the safe and reliable operation of the VCSNS. The issuance and control of this Plan and the activities associated with emergency preparedness shall be the overall responsibility of the Vice President, Nuclear Operations. This individual is assigned the responsibility for overall implementation of the VCSNS Emergency Plan and Unit Annexes.

3. Responsibility for Development and Maintenance of the Plan

The Manager, Emergency Planning and Supervisors, Emergency Services are responsible for the overall Emergency Preparedness Program associated with the operation of VCSNS and to administer the program to ensure availability of resources in the event of an emergency.

The Manager, Emergency Planning is assisted by the station Emergency Preparedness Unit. Specific responsibilities include the following:

Program Administration

- Develop and maintain the Emergency Plan, Appendices, Unit Annexes, implementing procedures and administrative documents
- Develop and maintain 10 CFR 50.54(q) evaluations for changes to Emergency Plan documents

- Coordinate and maintain the Emergency Plan activities schedule
- Develop and maintain working relationships and coordinate meetings with federal, state and local agencies
- Ensure integration of plans between the station and offsite agencies
- Provide an opportunity to discuss EALs and the availability of SCE&G Quality Systems Group audit results relating to interface with governmental agencies
- Coordinate, negotiate, and maintain agreements and contracts with offsite agencies and support organizations
- Obtain Letters of Agreement with major medical facilities, and medical consultants specifically skilled in the medical aspects of radiation accidents resulting in excessive exposure, contamination and/or ingestion of radioactive materials
- Coordinate the development and annual distribution of the station's public information publication
- Coordinate and administer the self-assessment program to monitor and evaluate the adequacy of the Emergency Preparedness Program
- Coordinate and support Emergency Plan audits and inspections
- Ensure the documentation and resolution of adverse conditions in the Emergency Preparedness Program discovered through drills, audits, etc. in accordance with the Corrective Action Program
- Coordinate and develop Operational Experience responses as assigned
- Coordinate, document, and review Emergency Preparedness Performance Indicator data and reports
- Provide oversight of Drill and Exercise Performance (DEP) evaluations during License Operator Qualification and Requalification Training
- Coordinate and conduct Emergency Plan Event reviews and reports
- Maintain adequate documentation/files to support Emergency Plan activities
- Develop and manage the Emergency Plan budget
- Maintain the Emergency Planning Telephone Directory

<u>Drills and Exercises</u>

- Coordinate and maintain the Emergency Plan drill and exercise schedule
- Coordinate and conduct exercises and drills

- Coordinate NRC, FEMA, state, and local exercise scheduling and development activities
- Coordinate drill and exercise scenario development activities
- Develop and publish drill and exercise scenario manuals
- Coordinate and perform Controller and Evaluator functions for drills and exercises
- Coordinate the selection and ensure the training of Controllers for onsite drills and exercises
- Coordinate response cells for drills and exercises
- Maintain documentation of drill and exercise objectives demonstration and their results
- Develop and issue drill and exercise reports

Facilities and Equipment

- Provide maintenance and administration of the Alert and Notification System (ANS)
- Provide maintenance of the ERO call-out system
- Ensure the ERFs are maintained in a constant state of readiness
- Coordinate and review the Emergency Plan equipment inventories
- Coordinate and conduct maintenance and testing of the communications systems
- Maintain the Emergency Plan computer applications

ERO Qualification and Administration

- Develop and maintain ERO lesson plans, examinations, and qualification records
- Ensure through letters, meetings, seminars, or other means available, that all affected personnel in the ERO are informed of changes to the Emergency Plan and procedures
- Maintain Emergency Plan SOT content
- Coordinate, schedule, and conduct ERO qualification and requalification training
- Oversee the maintenance of ERO training records
- Maintain and coordinate publishing of the ERO duty rosters
- Provide adequate oversight and support for the training of offsite response personnel
- Coordinate conduct of Emergency Medical Assistance Program training
- Coordinate annual training for the media

The Vice President, Nuclear Operations is responsible for implementation of the Emergency Plan, with the General Manager, Nuclear Support Services overseeing the process. The General Manager, Nuclear Support Services has the following responsibilities for maintenance of the Emergency Preparedness Program:

- Ensure the adequate staffing and training of station ERO members
- Schedule and conduct drills and exercises to maintain the state of readiness of the Emergency Preparedness Program
- Ensure the operational readiness of station facilities and communication systems for use during an emergency
- Ensure the operational readiness of station emergency equipment and supplies is maintained
- Ensure the Emergency Plan implementing procedures are maintained

4. Emergency Plan and Agreement Revisions

The Emergency Plan, the Appendices and Unit Annexes, and supporting Agreements are reviewed on an annual basis. The annual Emergency Plan review/update includes required changes, as directed by management, and those changes identified during audits, assessments, training, drills, and exercises. The Manager, Emergency Planning is responsible for determining which recommended changes are incorporated into an Emergency Plan or emergency procedure revision. In those years when the review does not warrant a revision, a letter or memorandum to that affect will be issued.

The Emergency Plan and the Appendices and Unit Annexes shall be revised as needed and the most current approved revisions shall remain in effect so long as they are verified as current. Revisions to the Emergency Plan are reviewed by the Plant Safety Review Committee before approval. Changes to the Plan are made without NRC approval only if such changes do not reduce the effectiveness of the Plan in accordance with 10 CFR 50.54(q), and the Plan as changed continues to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E. Proposed changes that reduce or have a potential to reduce the effectiveness of the approved Plan are not implemented without prior approval by the NRC.

- Proposed revisions to the Emergency Plan, the Appendices, and Unit Annexes shall be completed in accordance with the VCSNS review and approval processes.
- Emergency Plan, Appendices, and Unit Annexes changes shall be categorized as (1) minor/administrative or (2) significant programmatic changes. Minor/administrative changes shall be implemented within 30 days of approval. Significant programmatic changes shall be implemented as soon as practical and within 90 days of final station approval.
- After review and approval, the Emergency Plan, Appendices, and Unit Annexes shall be:

    a) Reviewed by the Manager, Emergency Planning or designee

    b) Approved for use by the General Manager, Nuclear Plant Operations, or designee.

- The Implementing Procedures shall be developed and revised concurrent with the Emergency Plan, Appendices, and Unit Annexes, and reviewed every two years.

Annually, each Letter of Agreement is reviewed and certified current in order to ensure the availability of assistance from each supporting organization not already a party to the South Carolina Operational Radiological Emergency Response Plan.

5. Emergency Plan Distribution

Emergency Plans, the Appendices, and Unit Annexes, and the implementing procedures are distributed as necessary on a controlled basis to the ERFs. Electronic copies of documents are also available on the company's computer network. All controlled document holders are issued revision changes upon approval. Selected federal, state, and local agencies, and other appropriate locations requiring them are also issued copies. Procedures are in place that control the revision of the Emergency Plan.

6. Supporting Emergency Response Plans

Other plans that support this Emergency Plan are:

- NUREG-0728, U.S. NRC, "Concept of Operations: NRC Incident Response"
- National Response Framework
- South Carolina Operational Radiological Emergency Response Plan
- Fairfield County Emergency Operations Plan
- Newberry County Emergency Operations Plan
- Richland County Emergency Operations Plan
- Lexington County Emergency Operations Plan
- State of North Carolina Emergency Response Plan for Nuclear Power Facilities
- DOE, Region 3, "Radiological Assistance Plan"
- INPO Emergency Resources Manual
- VCSNS Security Plan — Note: The Plan contains safeguards information that must be withheld from public disclosure under provisions of 10 CFR 73.21.

7. Implementing and Supporting Procedures

Appendix 3 of this Plan contains a listing, by title, of those procedures that implement this Plan during an emergency. Additionally, administrative procedures that outline the steps taken to maintain the VCSNS Emergency Preparedness Program have been developed and are also listed in Appendix 3.

8. Cross-Reference to Planning Criteria

The Plan is formatted in the same manner as NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in support of Nuclear Power Plants." The use of this format lends itself to uncomplicated comparison of the criteria set forth in NUREG-0654. Appendix 6 provides the cross reference for this Plan to the criteria in NUREG-0654.

9. Audit/Assessment of the Emergency Preparedness Program

To meet the requirements of 10 CFR 50.54(t), the Manager, Emergency Planning shall coordinate an independent review of the Emergency Preparedness Program to examine conformance with 10 CFR 50.47, 10 CFR 50.54, and 10 CFR 50, Appendix E. Included in the audit/assessment are the following:

- The Emergency Plan and associated implementing procedures
- The Emergency Preparedness Training Program, including drills and exercises
- The readiness of the Station ERO to perform its function
- The documents and programs used to direct and document the administrative portion of the Emergency Preparedness Program
- The readiness of facilities and equipment to perform as outlined in the plan and procedures
- The interfaces between VCSNS, the state, and county governmental agencies pertaining to the overall Emergency Preparedness Program

The Nuclear Safety Review Committee will ensure that an audit of the VCSNS Emergency Planning Program is performed at least once every 12 months.

Results of this audit are submitted for review to the Vice President, Nuclear Operations. The Manager, Emergency Planning ensures that any findings that deal with offsite interfaces are reviewed with the appropriate agencies. Written notification will be provided to the state and counties regarding the results of the audit on the adequacy of interface with the state and local governments and the availability of the audit records for review at VCSNS.

10. Maintenance of Emergency Telephone Numbers

Names and phone numbers of the ERO, support personnel/agencies, and ERFs in the emergency plan implementing procedures and the Emergency Planning Telephone Directory shall be reviewed and updated at least quarterly.

Annex 1: Unit 1

Section 1: Introduction

This VCSNS Emergency Plan Annex provides unit specific details for Unit 1.

This includes a unit description (type of reactor, relationship to other units, special emergency equipment), shift staffing, EALs, and any emergency facility locations which differ from those described in the Plan for a full understanding and representation of the Station's emergency response capabilities. This Unit 1 Annex is subject to the same review and audit requirements as the Radiation Emergency Plan.

1.1 Unit 1 Description

The VCSNS is owned jointly by SCE&G and Santee Cooper but is operated by SCE&G. An area map showing geographical location of the facility is provided on Figure 1-1 in Part 1 of the VCSNS Emergency Plan.

Unit 1 uses a pressurized water reactor nuclear steam supply system, designed and furnished by Westinghouse Electric Corporation and a turbine generator, designed and furnished by General Electric Company. The system uses chemical shim and control rods for reactivity control and U-tubed steam generators.

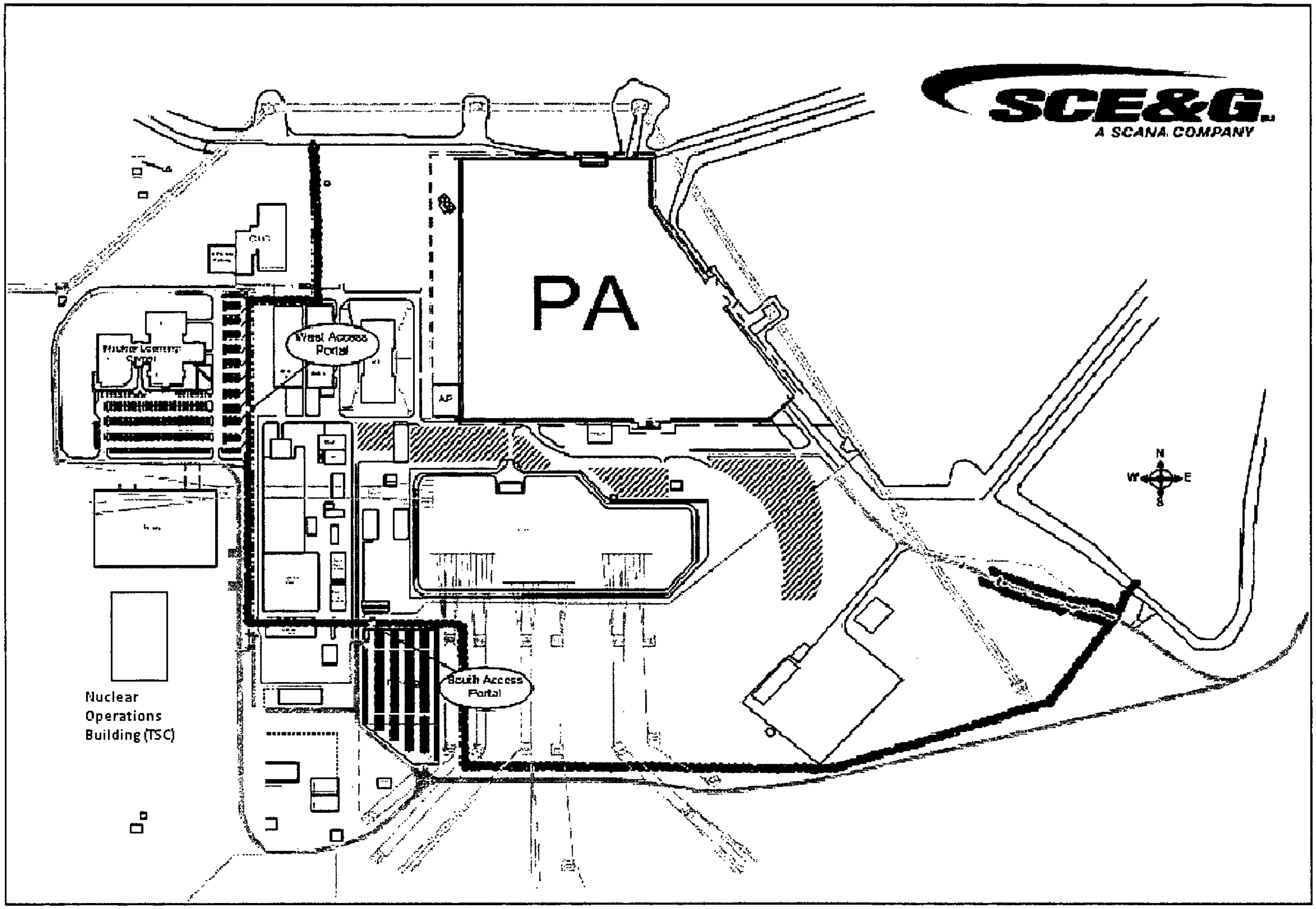


Figure A1-1 Unit 1 Facility Layout (specimen)

Section 2: Organizational Control of Emergencies

Section B of the Plan describes the station's ERO. When the ERO is fully activated, it will be staffed as described in Section B of the Plan. This section and table of the Unit 1 Annex describes the on-shift ERO staffing and their responsibilities to implement the Plan.

2.1 Normal Shift Staffing

The VCSNS operating organization includes the personnel encompassing both the management and operation of the unit. The maintenance and technical support personnel staffing the station organization are normally onsite daily Monday through Friday, holidays excluded. Plant personnel who are on duty on a 24-hour basis are listed in Table 2-1.

The Shift Supervisors, one of whom is on duty at all times, are responsible for the safe and efficient operation of the plant in accordance with the Technical Specifications and operating procedures during their assigned shift. The duty Shift Supervisor maintains control over plant operations as the senior licensed operator unless properly relieved by another member of the station staff who holds a valid SRO License. The Control Room Supervisor maintains control over the conduct of operations and personnel in the Control Room.

Shift Engineers perform accident assessment and evaluate operating conditions. Organizationally, they report to the Manager, Operations. While on duty they diagnose off-normal events and report to the Shift Supervisor. The duties of the Shift Engineer do not include the manipulation of controls or the supervision of operators. When on duty, he will be available to the Shift Supervisor in the Control Room within 10 minutes of being summoned. During emergency conditions, the Shift Engineer will report to the Control Room and perform the duties similar to a Shift Technical Advisor (STA).

During off-hour shifts, the plant is staffed to support continuous operation. The normal operational staff includes (as a minimum) two licensed SROs (the Shift Supervisor and Control Room Supervisor), two licensed reactor operators, and five non-licensed operators. In addition, a Shift Engineer is assigned to each shift. The initial emergency organization during off-hours shifts consists of the operating staff, with the Shift Supervisor serving as the IED. The IED may be relieved in the Control Room by another SRO qualified as an IED. Initial actions in regard to first aid, firefighting, rescue, damage control, radiation monitoring, emergency classification, notifications, and dose assessment are performed by the normal operational staff.

2.2 Shift Emergency Response Positional Responsibilities

The Unit 1 Annex, Table 2-1 outlines shift ERO positions required to meet minimum staffing and the major tasks assigned to each position.

Table 2-1 V. C. Summer On-Shift Staffing and ERO Positions

Functional Area	Major Tasks	Shift Position	Minimum Shift Compliment	ERO Position
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor Control Room Supervisor Reactor Operator Auxiliary Operator	1 1 2 5	Interim Emer. Dir. Control Room Supervisor Reactor Operator Auxiliary Operator
2. Emergency Direction and Control	Command and Control	Shift Supervisor	(a)	Interim Emergency Director
3. Notification & Communication	Emergency Communications	Shift Supervisor Communicator	(a) 1(e)	Interim Emergency Director State/County Communicator (e)
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Dose Assess./Health Physics	Health Physics Specialist	1	Health Physics Specialist
	In-plant Surveys	Health Physics Specialist	1	Health Physics Specialist
	Chemistry	Chemistry Specialist	1	Chemistry Specialist
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Engineer	1	Shift Engineer
	Repair and Corrective Actions	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic	2 2 2	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic
6. In-Plant Protective Actions	Radiation Protection	Health Physics Specialist	(b)	Health Physics Specialist
7. Fire Fighting	—	Fire Brigade	(c)(f)	Fire Brigade
8. First Aid and Rescue Operations	—	Medical Emergency Response Team	(b)(f)	Plant Personnel
9. Site Access Control and Personnel Accountability	Security and Accountability	Security Force	(d)	Security Force

(a) The Shift Supervisor shall function as the IED until relieved by the Emergency Director, Offsite Emergency Manager, and Emergency Control Officer
(b) May be provided by shift personnel assigned other functions
(c) Per station Fire Protection Plan
(d) Per VCSNS Security Plan
(e) Telephone Communicator only
(f) Support provided by offsite response organizations

Section 3: Classification of Emergencies

Section D in Part 2 of the Plan describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY. These classification levels are entered by meeting the criteria of EALs provided in EPP-001, Activation and Implementation of Emergency Plan.

The EALs and the Technical Bases for the EALs are based on NEI 99-01, "Methodology for the Development of Emergency Action Levels." The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

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. 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 75 minutes after the declaration of an Alert, SAE, or GE.

Equipment and supplies for the OSC include protective clothing, dosimetry, and sampling and survey equipment to be used by the OSC teams.

Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

In the event the OSC becomes uninhabitable, Emergency Planning Implementing Procedures provide details on how to relocate OSC personnel.

C. Onsite Laboratories

Chemistry laboratories located on the 412' elevation in the Control Building are available for emergency response during an accident. The laboratories can receive power from the plant's emergency diesel generators. General capabilities include:

- Radionuclide identification in various sample media
- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment

D. First Aid Treatment Area

First aid treatment areas are located onsite for the treatment of those individuals requiring first aid. These areas are located at the Radiation Control Area Control Point at the 412' elevation of the Control Building and at the 436' elevation of the Service Building. Medical equipment and supplies are available at these locations.

E. Decontamination Area

The decontamination facility at VC Summer Unit 1 is located at the Radiation Control Area Control Point, elevation 412' of the Control Building.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Redundant wind and temperature sensors are installed on a 61-meter self-supporting tower for Unit 1. Instrument elevators and 8-foot instrument booms are installed to raise and lower the sensors for easier maintenance. Measurements from these instruments provide indications to various points on the site, including recorders within the Control Room. A dew point sensor is installed near the base of the tower. A total precipitation sensor is installed on an individual pedestal near the tower. Data processing and recording equipment are located at the base of the tower. The tower is located about 1563 feet west of the Reactor Building at elevation 436 feet above MSL. The Reactor Building is at elevation 436 feet above MSL, and Monticello Reservoir is filled to elevation 425 feet above MSL. Elevations in the site vicinity range from below 230 feet on the Broad River to over 600 feet near Little Mountain. The tower-mounted sensors are as follows:

    a. At 61 meters above ground level, the upper wind speed and wind direction sensors, as well as the upper temperature sensors for the 10-61 meter differential temperature measurements are mounted on the 8-foot instrument boom.

    b. At 40 meters above ground level, the upper temperature sensors for the 10-40 meter delta temperature measurement is mounted on the 8-foot instrument boom.

    c. At 10 meters above ground level, the lower wind speed and wind direction sensors, as well as the lower temperature sensors for the 10-61 and 10-40 meter differential temperature measurements and ambient temperature readings are mounted on the 8-foot boom. Data from the meteorological measurements system are provided to an onsite data capture computer (which is capable of various data manipulations). Meteorological data necessary for the estimation of offsite dose projections is available via terminals to personnel in the Control Room, TSC, and EOF. When the onsite meteorological tower is not available for the estimation of offsite dose projections, meteorological data from the NWS in Columbia, South Carolina, will be used.

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area RMS; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and are listed in Table 4-1, Radiation Monitoring System Description.

Table 4-1 Radiation Monitoring System Description

Instrument Channel	Location	Range
Alpha Gamma Monitor		
RM G1	Control Room	0.1 mr/hr -10 r/hr
RM G2	Radio Chemical Laboratory	0.1 mr/hr -10 r/hr
RM G3	Sampling Room	0.1 mr/hr -10 r/hr
RM G4	Hot Machine Shop	0.1 mr/hr -10 r/hr
RM-G5	Reactor Building Personnel Access	0.1 mr/hr -10 r/hr
RM G6	Reactor Building Refueling Bridge	0.1 mr/hr -10 r/hr
RM G7	Reactor Building	1 r/hr - 10^7 r/hr
RM G8	Fuel Handling Building Refueling Bridge	0.1 mr/hr -10 r/hr
RM G9	Auxiliary Building Demineralizer Area	0.1 mr/hr -10 r/hr
RM G10	Waste Gas Decay Tank Area	0.1 mr/hr -10 r/hr
RM G11	Auxiliary Building Drumming Area	0.1 mr/hr -10 r/hr
RM G12	Auxiliary Building Waste Holdup Tank Area	0.1 mr/hr -10 r/hr
RM G13	Auxiliary Building Charging Pump Area	0.1 mr/hr -10 r/hr
RM G14	Reactor Building In Core Instrumentation Area	0.1 mr/hr -10 r/hr
RM G15	Movable Monitor	0.1 mr/hr -10 r/hr
RM G16	Turbine Building	0.1 mr/hr -10 r/hr
RM G17A	Reactor Building Manipulator Crane	1 mr/hr -100 r/hr
RM G17B	Reactor Building Manipulator Crane	1 mr/hr -100 r/hr
RM G18	Reactor Building	1 r/hr -107 r/hr
RM G19A	Main Steam Line	0.1 mr/hr -107 mr/hr
RM G19B	Main Steam Line	0.1 mr/hr -107 mr/hr
RM G19C	Main Steam Line	0.1 mr/hr -107 mr/hr
Atmospheric Radiation Monitors		
RM-1A	Control Room Supply Air Particulate:	4.7×10^{-11} to 1×10^{-7} μCi/cc
	Gas:	2×10^{-6} to 2×10^{-2} μCi/cc
	Iodine:	2×10^{-11} to 1×10^{-7} μCi/cc
RM-A2	Reactor Building Air Samples Particulate:	5.5×10^{-11} to 1×10^{-7} μCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} μCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} μCi/cc
RM A3	Main Plant Vent Same as RM Particulate:	4.7×10^{-11} to 1×10^{-7} μCi/cc
	Gas:	2.6×10^{-6} to 2×10^{-2} μCi/cc
	Iodine:	2×10^{-11} to 2×10^{-7} μCi/cc

Table 4-1 Radiation Monitoring System Description (continued)

Instrument Channel	Location		Range
Atmospheric Radiation Monitors (continued)			
RM A4	Reactor Building Purge Exhaust	Particulate:	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A6	Fuel Handling Building Exhaust	Particulate:	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A7	Sampling Rm Monitor (Movable)	Particulate:	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A8	Spent Fuel Area Monitor (Movable)	Particulate:	4.7×10^{-11} to 1×10^{-7} µCi/cc
		Gas:	2.6×10^{-6} to 2×10^{-2} µCi/cc
		Iodine:	2×10^{-11} to 2×10^{-7} µCi/cc
RM A9	Condenser Exhaust Monitor		4×10^{-6} to 4×10^{-2} µCi/cc
RM A10	Waste Gas Discharge		2×10^{-4} to 2×10^{0} µCi/cc
RM A11	Auxiliary Building Ventilation Monitor		2×10^{-6} to 2×10^{-2} µCi/cc
RM A12	Movable Atmospheric Monitor		4.7×10^{-11} to 1×10^{-7} µCi/cc
RM A13	Main Plant Vent		8.6×10^{-3} to 8.6×10^{5} µCi/cc
RM A14	Reactor Building Purge Exhaust		8.6×10^{-3} to 8.6×10^{5} µCi/cc
Liquid Radiation Monitors			
RM L1	Primary Coolant Letdown Monitor		1×10^{-3} to 1×10^{3} µCi/cc
RM L2A	Component Cooling Monitors		1×10^{-6} to 2×10^{-2} µCi/cc
RM L2B	Component Cooling Monitors		1×10^{-6} to 2×10^{-2} µCi/cc
RM L3	Steam Generator Blowdown		1×10^{-6} to 2×10^{-2} µCi/cc
RM L4	Spent Fuel Cooling Water Monitor		1×10^{-6} to 2×10^{-2} µCi/cc
RM L5	Liquid Waste Effluent		1×10^{-6} to 2×10^{-2} µCi/cc
RM L6	Boron Recycle		1×10^{-6} to 2×10^{-2} µCi/cc
RM L7	Nuclear Blowdown Waste Effluent		1×10^{-6} to 2×10^{-2} µCi/cc
RM L8	Turbine Building Sump		2×10^{-7} to 2×10^{-3} µCi/cc
RM L9	Liquid Waste Effluent		1×10^{-6} to 2×10^{-2} µCi/cc
RM L10	Steam Generator Blowdown Effluent RM		1×10^{-6} to 2×10^{-2} µCi/cc
RML11	Condensate Polisher Backwash Effluent		1×10^{-6} to 1×10^{-3} µCi/cc

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of an elevated radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 1 FSAR. The operability of the post-accident instrumentation ensures information is available on selected plant parameters to monitor and assess important variables following an accident. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

VCSNS has provided seismic instrumentation for onsite monitoring of the nuclear station. Triaxial time history accelerometers are operable onsite with recorders located in the relay room below the Control Room. An indication and/or an audible alarm in the Control Room is actuated (1) when the triaxial seismic switch at the Reactor Building foundation mat signals that the OBE acceleration has been exceeded in either of the horizontal directions or in the vertical direction, (2) when any of the 12 elements of each component of the triaxial response spectrum recorder at the Reactor Building foundation mat exceeds the frequency acceleration setpoint, or (3) when the seismic accelerometer at the Reactor

Building foundation mat detects acceleration greater than 0.01g in either horizontal direction or greater than 0.0067g in the vertical direction. Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable National Fire Protection Association (NFPA) standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection Carbon Dioxide, Halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose projection software system is comprised of a series of software components that function in a multi-tasked Windows environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all run from a GUI interface.

The software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed, based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site and local maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 1 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel range from take immediate cover, assembly, or evacuation of an area or the site. Protective actions will be issued individually or in combination, based on the health and safety of site personnel. There are four distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, and the Owner Controlled Area (OCA). Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take Immediate Cover may be used in a security threat situation where there is little or no time to relocate personnel, or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for the Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 1 Assembly Area is located in the Nuclear Operations Building located southwest of Unit 1, outside the Protected and Owner Controlled Areas. There is ample space for non-essential personnel from all areas of the site. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area.

5.3 Unit Evacuation Routes

There are two exits from the Unit 1 OCA barriers. Both of these exits will be used provided that there is evacuation prior to any release of radioactive material. This permits the nonessential personnel at the site an opportunity to depart the site using their personal vehicles. In the event that there is, or has been a radiological release, personnel will be directed as to which exit to use and the egress route to minimize personnel exposure and vehicle contamination.

There are also two distinct exits from the Nuclear Exclusion Area. The North access road and the South access road (off Fairfield Pump Storage road and through the construction site for Units 2 & 3) provide entry and exit from the Exclusion Area in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the Nuclear Exclusion Area is controlled at these locations during a declared emergency of Alert or higher classification.

Annex 2: Unit 2

Section 1: Introduction

This Plan Annex provides unit-specific details for Unit 2.

This includes a unit description (type of reactor, relationship to other units, special emergency equipment), shift staffing, EALs, and any emergency facility locations that differ from those described in the emergency plan for a full understanding and representation of the station's emergency response capabilities. This Unit 2 Annex is subject to the same review and audit requirements as the Radiation Emergency Plan.

1.1 Unit 2 Description

The VCSNS is owned jointly by SCE&G and Santee Cooper but is operated by SCE&G. An area map showing the geographical location of the facility is provided Figure 1-1 in Part 1 of the Plan.

The design of Unit 2 is that of a passive pressurized water-type nuclear steam supply system supplied and manufactured by Westinghouse. The system uses chemical shim and control rods for reactivity control and U-tubed steam generators. A diagram identifying VCSNS Unit 2 facilities is provided in Figure B1-1.

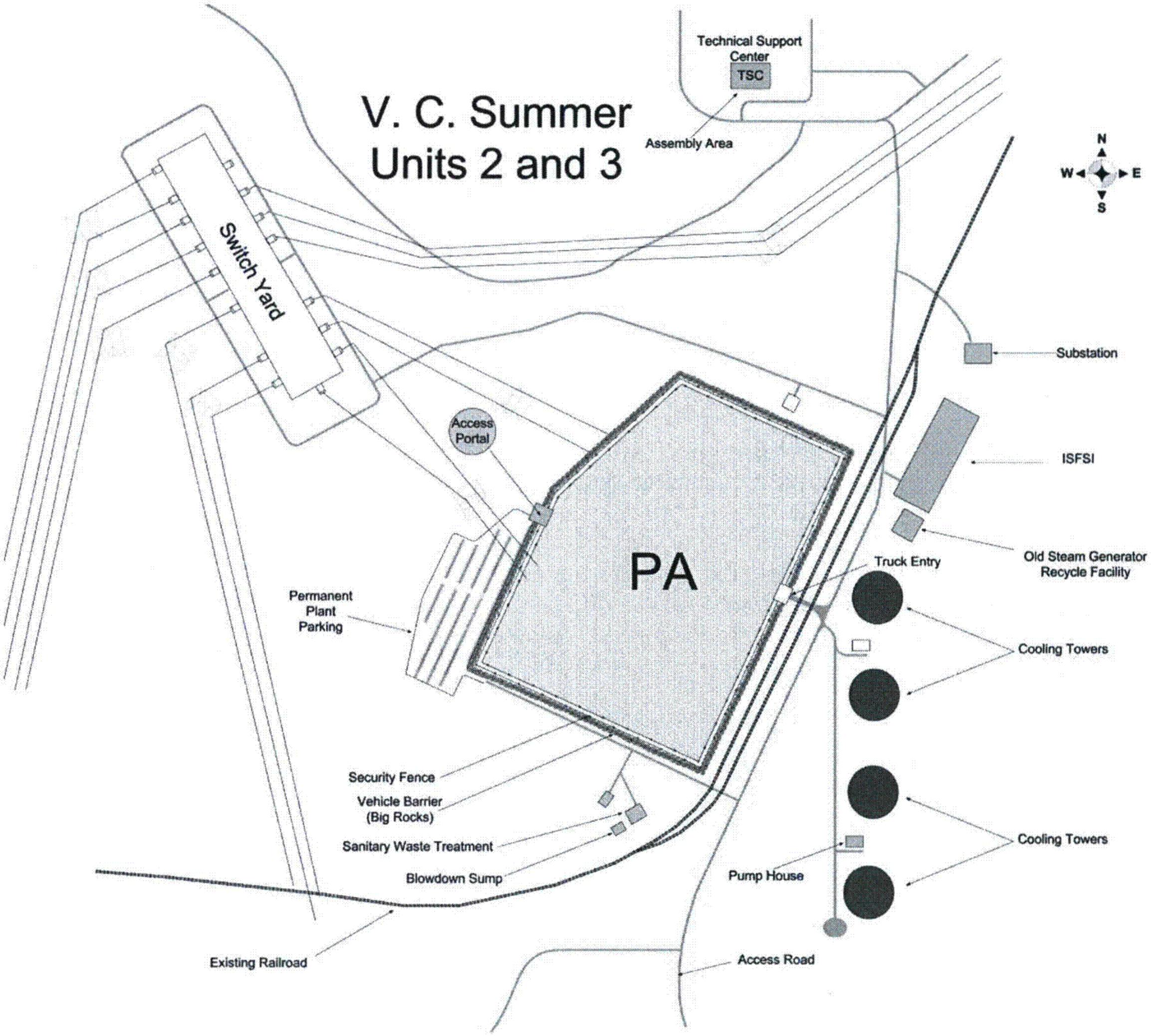


Figure B1-1 Units 2 and 3 Facility Layout (specimen)

Section 2: Organizational Control of Emergencies

Section B of the Plan describes the Station's ERO. This section of the Unit 2 Annex describes the on-shift ERO staffing and their responsibilities to implement the Plan.

2.1 Normal Shift Staffing

The VCSNS operating organization includes the personnel encompassing both the management and operation of the unit. The maintenance and technical support personnel staffing the station organization are normally onsite daily Monday through Friday, holidays excluded. Personnel who are on duty on a 24-hour basis are listed in Table 2-1.

The Shift Supervisors, one of whom is on duty at all times, are responsible for the safe and efficient operation of the plant in accordance with the Technical Specifications and operating procedures during their assigned shift. The duty Shift Supervisor maintains control over plant operations as the senior licensed operator unless properly relieved by another member of the station staff who holds a valid SRO License. The Shift Supervisor maintains control over the conduct of operations and personnel in the Control Room.

STAs perform accident assessment and evaluate operating conditions. Organizationally, they report to the Manager, Operations. While on duty they diagnose off-normal events and report to the Shift Supervisor. The duties of the STA do not include the manipulation of controls or the supervision of operators. When on duty, he will be available to the Shift Supervisor in the Control Room within 10 minutes of being summoned. During emergency conditions, the STA will report to the Control Room and perform as an STA.

During off-hour shifts, the plant is staffed to support continuous operation. The normal operational staff includes (as a minimum) two licensed SROs (the Shift Supervisor and Control Room Supervisor), two licensed reactor operators, and two non-licensed operators. In addition, an STA is assigned to each shift. The initial emergency organization during off-hours shifts consists of the operating staff, with the Shift Supervisor serving as the IED. The IED may be relieved in the Control Room by another SRO qualified as an IED. Initial actions in regard to first aid, firefighting, rescue, damage control, radiation monitoring, emergency classification, notifications, and dose assessment are performed by the normal operational staff.

2.2 Shift Emergency Response Positional Responsibilities

The Unit 2 Annex, Table 2-1 outlines Shift ERO positions required to meet minimum staffing and the major tasks assigned to each position. In the event that Unit 2 declares an emergency and it is the affected unit, the Unit 2 Shift Supervisor will assume the duties of the IED. The Unit 2 on-shift personnel will be augmented by personnel from the other site unit(s). Personnel from the other site unit(s) may be dispatched to assist the Unit 2 On-Shift personnel when it is safe to do so. These additional personnel will provide the needed resources to enhance the response to the event until the On-Call ERO personnel respond, and are ready to activate the ERFs. Unit 1 is the lead unit for declaring and responding to an emergency that affects the entire site, such as a security or natural phenomena related event, or if there are multiple units in a declared emergency simultaneously. Should one of these events occur, the Shift Supervisor from Unit 2 would direct the operational response of the emergency/event when it is safe to do so. The Unit 2 Shift Supervisor would provide the needed information to the Unit 1 Shift Supervisor who declares the emergency and assumes the role of IED and all of the duties associated with that position.

Table 2-1: V. C. Summer On-Shift Staffing and ERO Positions

Functional Area	Major Tasks	Shift Position	Minimum Shift Compliment	ERO Position
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor Control Room Supervisor Reactor Operator Auxiliary Operator	1 1 2 2	Interim Emer. Dir. Control Room Supervisor Reactor Operator Auxiliary Operator
2. Emergency Direction and Control	Command and Control	Shift Supervisor	(a)	Interim Emergency Director
3. Notification & Communication	Emergency Communications	Shift Supervisor Communicator	(a) 1(e)	Interim Emergency Director State/County Communicator (e)
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Dose Assess./Health Physics	Health Physics Specialist	1	Health Physics Specialist
	In-plant Surveys	Health Physics Specialist	1	Health Physics Specialist
	Chemistry	Chemistry Specialist	1	Chemistry Specialist
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Technical Advisor	(b)	Shift Technical Advisor
	Repair and Corrective Actions	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic	1 1 1	Mechanical Maint. Mechanic Electrical Maint. Electrician I&C Maint. Mechanic
6. In-Plant Protective Actions	Radiation Protection	Health Physics Specialist	(b)	Health Physics Specialist
7. Fire Fighting	—	Fire Brigade	(c)(f)	Fire Brigade
8. First Aid and Rescue Operations	—	Medical Emergency Response Team	(b)(f)	Plant Personnel
9. Site Access Control and Personnel Accountability	Security and Accountability	Security Force	(d)	Security Force

(a) The Shift Supervisor shall function as the IED until relieved by the Emergency Director, Offsite Emergency Manager, and Emergency Control Officer
(b) May be provided by shift personnel assigned other functions
(c) Per station Fire Protection Plan
(d) Per VCSNS Security Plan
(e) Telephone Communicator only
(f) Support provided by offsite response organizations

Section 3: Classification of Emergencies

Section D in Part 2 of the plan describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY.

The EALs and the technical bases for the EALs are based on NEI 07-01, Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

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.

B. Operations Support Center

The OSC is located in the Control Support Area in the Annex Building on 417'-6" elevation and is separated from the Control Room. The OSC is the location from which survey, operations, and repair teams are dispatched into areas of the plant and 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 tracks individuals who are assigned to the Control Room Watch 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 75 minutes after the declaration of an Alert, SAE, or GE.

Equipment and supplies for the OSC include protective clothing, dosimetry, sampling, and survey equipment to be used by the OSC teams.

Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

In the event the OSC becomes uninhabitable, Emergency Plan Implementing Procedures (EPIP) provide details on how to relocate OSC personnel.

C. Onsite Laboratories

The radiochemistry laboratory on the 382'-6" elevation in the Auxiliary Building is available for emergency response during an accident. The laboratories can receive power from the plant's diesel generators. General capabilities include:

- Radionuclide identification in various sample media.
- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment.

D. First Aid/Decontamination Area

The Health Physics area near the work exits contains the personnel contamination monitoring equipment, decontamination shower facilities, and first-aid equipment.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Wind and temperature sensors are installed on a 60-meter tower. An instrument elevator and 8-foot instrument booms are used to raise and lower the sensors for easier maintenance. These instruments provide indication to various points on the site including recorders within the Control Room. A total precipitation sensor and dew point sensor are located near the base of the Unit 1 meteorological tower. A processing computer is mounted at the base of the tower on a cabinet rack. This cabinet rack is located on a concrete pad that is approximately 10 feet wide and 5 feet deep. The meteorological tower for Units 2 and 3 is about 0.75 mile southwest of the center of the Unit 2 reactor building and 0.5 mile southwest of the center of the Unit 3 reactor building at an elevation of 435.5 feet above MSL. The tower-mounted sensors are as follows:

   a. At 60 meters above ground level, the upper wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-60 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   b. At 30 meters above ground level, the wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-30 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   c. At 10 meters above ground level the lower wind speed and wind direction sensors as well as the lower temperature sensor for the 10-60 and 10-30 meter differential temperature measurements and ambient temperature readings are mounted on the 8-foot instrument boom.

   Data from the meteorological measurements system are provided to an onsite processing computer (which is capable of various data manipulations). Meteorological data necessary for the estimation of offsite dose projections is available via terminals to personnel in the Control Room, TSC, and EOF. Should the computerized information or the computer-based assessment system not be available or if results are suspect, the Unit 1 meteorological tower data will be used. When both onsite meteorological towers are not available for the estimation of offsite dose projections, meteorological data from the National Weather Service (NWS) in Columbia, South Carolina, will be acquired and used.

B. Onsite Radiation Monitoring Equipment

The onsite radiation monitoring capability includes an installed process, effluent, and area RMS; portable survey instrumentation; counting equipment for radiochemical analysis; and a personnel dosimetry program to record integrated exposure. Some onsite equipment is particularly valuable for accident situations and are listed in Table 4-1, Radiation Monitoring Detectors.

Table 4-1 Radiation Monitoring Detectors

Detector	Location	Range
VBS-RE001A	MCR Supply Air Duct (Particulate)	1 x 10^{-12} to 1 x 10^{-7} µCi/cc
VBS-RE001B	MCR Supply Air Duct (Particulate)	1 x 10^{-12} to 1 x 10^{-7} µCi/cc
VBS-RE002A	MCR Supply Air Duct (Iodine)	1 x 10^{-11} to 1 x 10^{-5} µCi/cc
VBS-RE002B	MCR Supply Air Duct (Iodine)	1 x 10^{-11} to 1 x 10^{-5} µCi/cc
VBS-RE003A	MCR Supply Air Duct (Gas)	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
VBS-RE003B	MCR Supply Air Duct (Gas)	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
PSS-RE026	Containment Atmosphere Gas	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
PSS-RE027	Containment Atmosphere N^{13}/F^{18}	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
BDS-RE010	Steam Generator Blowdown Electrodeionization Effluent	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
BDS-RE011	Steam Generator Blowdown Electrodeionization Brine	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
CCS-RE001	Component Cooling Water System	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
SGS-RE026	Main Steam Line	1 x 10^{-1} to 1 x 10^{3} µCi/cc
SGS-RE027	Main Steam Line	1 x 10^{-1} to 1 x 10^{3} µCi/cc
SWS-RE008	Service Water Blowdown	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
PSS-050	Primary Sampling Liquid	1 x 10^{-4} to 1 x 10^{2} µCi/cc
PSS-052	Primary Sampling Gaseous	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
VFS-RE001	Containment Air Filtration Exhaust	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
WGS-RE017	Gaseous Radwaste Discharge	1 x 10^{-5} to 1 x 10^{1} µCi/cc
VFS-RE101	Plant Vent Particulate	1 x 10^{-12} to 1 x 10^{-7} µCi/cc
VFS-RE102	Plant Vent Iodine	1 x 10^{-11} to 1 x 10^{-6} µCi/cc
VFS-RE103	Plant Vent Gas (Normal Range)	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
VFS-RE104A	Plant Vent Extended Range Gas(Accident Mid Range)	1 x 10^{-4} to 1 x 10^{2} µCi/cc
VFS-RE104B	Plant Vent Extended Range Gas(Accident High Range)	1 x 10^{-1} to 1 x 10^{5} µCi/cc
TDS-RE001	Turbine Island Vent Discharge	1 x 10^{-6} to 1 x 10^{5} µCi/cc
WLS-RE229	Liquid Radwaste Discharge	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
WWS-RE021	Waste Water Discharge	1 x 10^{-7} to 1 x 10^{-2} µCi/cc
VAS-RE001	Fuel handling Area Exhaust	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
VAS-RE002	Auxiliary Building Exhaust	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
VAS-RE003	Annex Building Exhaust	1 x 10^{-6} to 1 x 10^{-1} µCi/cc
VHS-RE001	Health Physics and Hot Machine Shop Exhaust	1 x 10^{-13} to 1 x 10^{-7} µCi/cc
VRS-RE023	Radwaste Building Exhaust	1 x 10^{-13} to 1 x 10^{-7} µCi/cc

Table 4-1 Radiation Monitoring Detectors (Continued)

Detector	Location	Range
Area Radiation Monitor Detection Parameters		
RMS-RE008	Primary Sampling Room	$1x10^{-1}$ to $1x10^{7}$ mR/hr
RMS-RE009	Containment Area – Personnel Hatch	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE010	Main Control Room	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE011	Chemistry Laboratory Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE012	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE013	Rail Car Bay Area/Auxiliary Bldg. Loading Bay	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE014	Liquid and Gaseous Radwaste Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE016	Control Support Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE017	Radwaste Bldg. Mobile Systems Facility	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE018	Hot Machine Shop	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE019	Annex Staging & Storage Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE020	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
PXS-RE160	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE161	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE162	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE163	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr

Note: Information acquired from Westinghouse AP1000 Design Control Document Tier 2 Chapter 11.5.

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of a raised radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 2 and 3 FSAR. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

Unit 2 has four triaxial acceleration sensor units and they are connected to a time-history analyzer. The time-history analyzer recording and playback system is located in a panel in the nuclear island in a room near the main control room. Seismic event data from these is recorded on a solid-state digital recording system at 200 samples per second per data channel.

This solid-state recording and analysis system has internal batteries and a charger to prevent the loss of data during a power outage, and to allow data collection and analysis in a seismic event during which the power fails. Normally, 120-volt alternating current power is supplied from the non-Class 1E dc and uninterruptible power supply system. The system uses triaxial acceleration sensor input signals to initiate the time-history analyzer recording and main control room alarms. The system initiation value is adjustable from 0.002g to 0.02g.

The time-history analyzer starts recording triaxial acceleration data from each of the triaxial acceleration sensors after the initiation value has been exceeded. Pre-event recording time is adjustable from 1.2 to 15.0 seconds, and will be set to record at least 3 seconds of pre-event signal. Post-event run time is adjustable from 10 to 90 seconds. A minimum of 25 minutes of continuous recording is provided. Each recording channel has an associated timing mark record with 2 marks per second, with an accuracy of about 0.02 percent.

The sensor installation anchors are rigid so that the vibratory transmissibility over the design spectra frequency range is essentially unity.

Triaxial Acceleration Sensors

Each sensor unit contains three accelerometers mounted in a mutually orthogonal array with one horizontal axis parallel to the major axis assumed in the seismic analysis. The triaxial acceleration sensors have a dynamic range of 1000 to 1 (0.001 to 1.0g) and a frequency range of 0.2 to 50 hertz.

One sensor unit will be located in the free field.

A second sensor unit is located on the nuclear island basemat in the spare battery charger room at elevation 366'-6" near column lines 9 and L.

A third sensor unit is located on the shield building structure at elevation 566' near column lines 4-1 and K.

The fourth sensor unit is located on the containment internal structure on the east wall of the east steam generator compartment just above the operating floor at elevation 438' close to column lines 6 and K.

Seismic instrumentation is not located on equipment, piping, or supports since experience has shown that data obtained at these locations is obscured by vibratory motion associated with normal plant operation.

Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of the VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable NFPA standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and Control Room annunciation. In addition to the smoke and heat detection systems, each fire protection Carbon Dioxide, Halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose assessment software system is comprised of a series of software components that function in a multi-tasked Windows environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all runs from a GUI interface.

The dose assessment software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 2 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel range from take immediate cover, assembly, and evacuation of an area or the site. Protective actions will be issued by themselves or in combination, based on the health and safety of site personnel. There are three distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, and the Owner Controlled Area (OCA). Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take immediate cover may be used in a security threat situation where there is little or no time to relocate personnel or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for each Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area (Offsite Holding Area) for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 2 Assembly Area is located in the Nuclear Operations Building located north of the Unit 2 outside the Protected Area. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area.

5.3 Unit Evacuation Routes

There are two distinct exits from the OCA. The North access road and the South access road provide entry and exit from the OCA in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the OCA is controlled at these locations during a declared emergency of Alert or higher classification.

Annex 3: Unit 3

Section 1: Introduction

This Plan Annex provides unit specific details for Unit 3.

This includes a unit description (type of reactor, relationship to other units, special emergency equipment), shift staffing, EALs, and any emergency facility locations that differ from those described in the emergency plan for a full understanding and representation of the station's emergency response capabilities. This Unit 3 Annex is subject to the same review and audit requirements as the Radiation Emergency Plan.

1.1 Unit 3 Description

The VCSNS is owned jointly by SCE&G and Santee Cooper but is operated by SCE&G. An area map showing the geographical location of the facility is provided Figure 1-1 in Part 1 of the Plan.

The design of Unit 3 is that of a passive pressurized water type nuclear steam supply system supplied and manufactured by Westinghouse. The system uses chemical shim and control rods for reactivity control and U-tubed steam generators. A diagram identifying VCSNS Unit 3 facilities is provided in Figure C1-1.

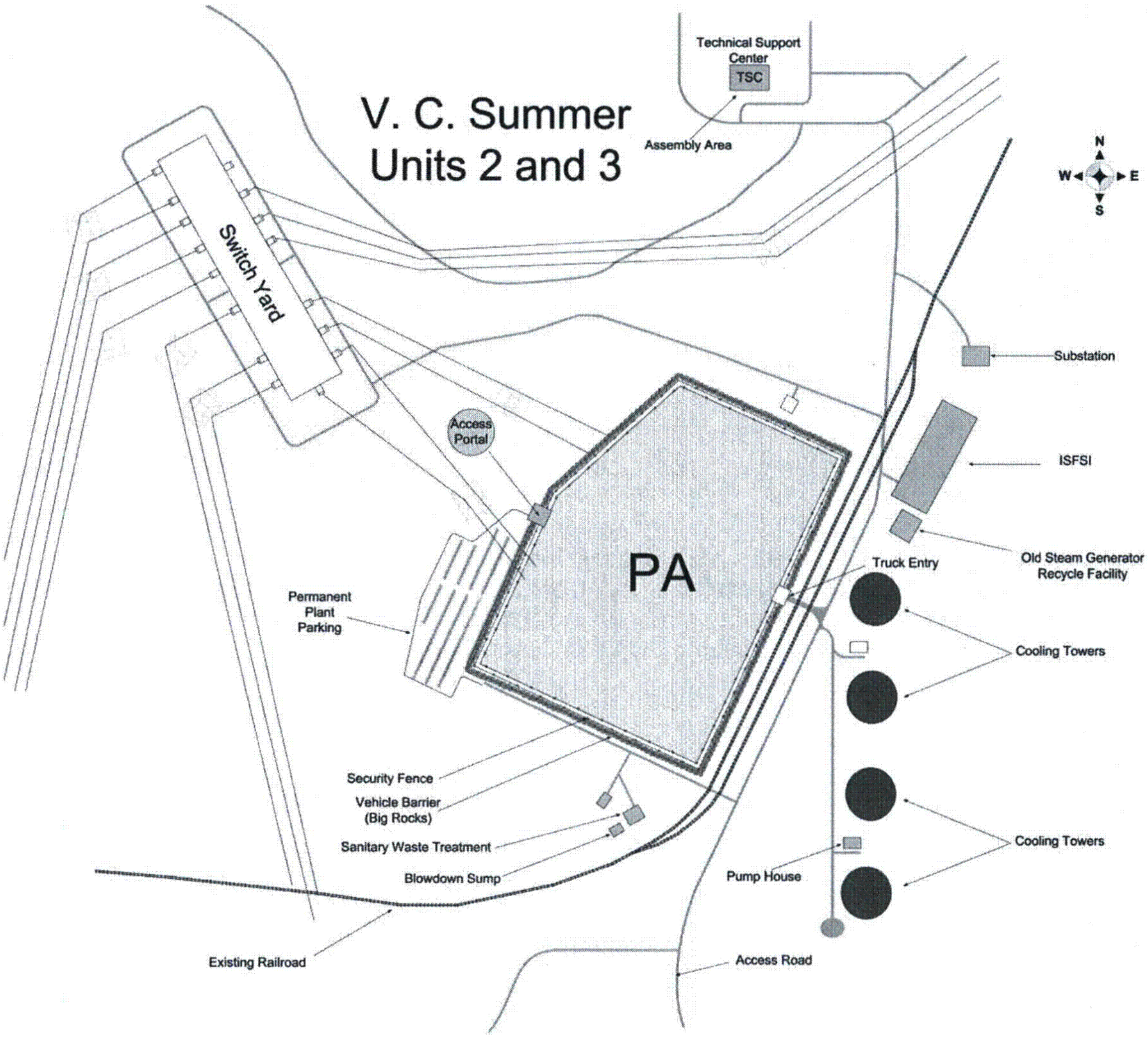


Figure C1-1 Units 2 and 3 Facility Layout (specimen)

Section 2: Organizational Control of Emergencies

Section B of the VCSNS Radiation Emergency Plan describes the Station's ERO. This section of the Unit 3 Annex describes the on-shift ERO staffing and their responsibilities to implement the emergency plan.

2.1 Normal Shift Staffing

The VCSNS operating organization includes the personnel encompassing both the management and operation of the unit. The maintenance and technical support personnel staffing the station organization are normally onsite daily Monday through Friday, holidays excluded. Personnel who are on duty on a 24-hour basis are listed in Table 2-1.

The Shift Supervisors, one of whom is on duty at all times, are responsible for the safe and efficient operation of the plant in accordance with the Technical Specifications and operating procedures during their assigned shift. The duty Shift Supervisor maintains control over plant operations as the senior licensed operator unless properly relieved by another member of the station staff who holds a valid SRO License. The Shift Supervisor maintains control over the conduct of operations and personnel in the Control Room.

STAs perform accident assessment and evaluate operating conditions. Organizationally, they report to the Manager, Operations. While on duty they diagnose off-normal events and report to the Shift Supervisor. The duties of the STA do not include the manipulation of controls or the supervision of operators. When on duty, he will be available to the Shift Supervisor in the Control Room within 10 minutes of being summoned. During emergency conditions, the STA will report to the Control Room and perform as an STA.

During off-hour shifts, the plant is staffed to support continuous operation. The normal operational staff includes (as a minimum) two licensed SROs (the Shift Supervisor and Control Room Supervisor), two licensed reactor operators, and two non-licensed operators. In addition, an STA is assigned to each shift. The initial emergency organization during off-hours shifts consists of the operating staff, with the Shift Supervisor serving as the IED. The IED may be relieved in the Control Room by another SRO qualified as an IED. Initial actions in regard to first aid, firefighting, rescue, damage control, radiation monitoring, emergency classification, notifications, and dose assessment are performed by the normal operational staff.

2.2 Shift Emergency Response Positional Responsibilities

The Unit 3 Annex, Table 2-1 outlines Shift ERO positions required to meet minimum staffing and the major tasks assigned to each position. In the event that Unit 3 declares emergency and it is the affected unit, the Unit 3 Shift Supervisor will assume the duties of the IED. The Unit 3 on-shift personnel may be augmented by personnel from the other site unit(s). Personnel from the other site unit(s) may be dispatched to assist the Unit 3 On-Shift personnel when it is safe to do so. These additional personnel will provide the needed resources to enhance the response to the event until the On-Call ERO personnel respond, and are ready to activate the ERFs. Unit 1 is the lead unit for declaring and responding to an emergency that affects the entire site, such as a security or natural phenomena related event, or if there are multiple units in a declared emergency simultaneously. Should one of these events occur, the Shift Supervisor from Unit 3 would direct the operational response of the emergency/event when it is safe to do so. The Unit 3 Shift Supervisor would provide the needed information to the Unit 1 Shift Supervisor who declares the emergency and assumes the role of IED and all of the duties associated with that position.

Table 2-1: V. C. Summer On-Shift Staffing and ERO Positions

Functional Area	Major Tasks	Emergency Positions	Minimum Shift Size
1. Plant Operations and Assessment of Operational Aspects	Control Room Staff	Shift Supervisor (CR)	1
		Control Room Supervisor (CR)	1
		Reactor Operator (CR)	2
		Non-licensed Operator	2
2. Emergency Direction and Control	Command and Control/Emergency Operations	Interim Emergency Director(CR)	1[(a)]
3. Notification & Communication	Emergency Communications	Shift Communicator (CR)	1
4. Radiological Accident Assessment and Support of Operational Accident Assessment	In-plant Surveys	HP Technicians	2
	Chemistry	Chemistry Personnel	1
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	STA/Incident Assessor (CR)	1[(b)]
	Repair and Corrective Actions	Mechanical Maintenance	1
		Electrical Maintenance	1
		Instrument & Control Technician	1
6. In-Plant Protective Actions	Radiation Protection	HP Personnel	2[(b)]
7. Fire Fighting	—	Fire Brigade	[(c)]
8. First Aid and Rescue Operations	—	Plant Personnel	2[(b)]
9. Site Access Control and Personnel Accountability	Security and Accountability	Security Team Personnel	[(d)]
		TOTAL:	**13[(e)]**

(a) The Shift Supervisor shall function as the IED until relieved by the EPOS or the ED when the EOF is activated.

(b) May be provided by personnel assigned other functions. Personnel can fulfill multiple functions.

(c) Per Station Fire Protection Plan.

(d) Per VCSNS Security Plan.

(e) This number represents the total number of personnel on shift available to fill response positions (non-superscript positions).

Section 3: Classification of Emergencies

Section D in Part 2 describes the classification of emergencies into four classification levels. They are: UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY.

The EALs and the technical bases for the EALs are based on NEI 07-01, Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. The details of EAL development are documented in an Emergency Action Level Technical Basis Document. Revision of the Technical Basis Document is controlled the same way as the VCSNS Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

Section 4: Emergency Facilities and Equipment

4.1 Unit-Specific Emergency Facilities

A. Operations Support Center

The OSC is located in the Control Support Area in the Annex Building on the 417'-6" elevation 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 and 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 tracks individuals who are assigned to the Control Room Watch 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 may be activated when “minimum staffing positions” are filled and all positions will be staffed within 75 minutes after the declaration of an Alert, SAE, or GE.

  Equipment and supplies for the OSC include protective clothing, dosimetry, sampling, and survey equipment to be used by the OSC teams.

  Radiological exposure controls for the OSC include monitoring conditions and relocation if necessary.

  Tools and parts available for normal plant maintenance are also available for damage control operations during emergencies.

  In the event the OSC becomes uninhabitable, EPIPs provide details on how to relocate OSC personnel.

B. Onsite Laboratories

The radiochemistry laboratory is located on the 382'-6" elevation in the Auxiliary Building and is available for emergency response during an accident. The laboratory can receive power from the plant's diesel generators. General capabilities include:

- Radionuclide identification in various sample media.
- Analysis and measurement of radionuclides in samples taken within the plant and samples taken in the plant site and offsite environment.

C. Medical Treatment Area

The Health Physics area near the work exits contains the personnel contamination monitoring equipment, decontamination shower facilities, and first-aid equipment.

4.2 Assessment Resources

A. Onsite Meteorological Monitoring Instrumentation

1. Wind and temperature sensors are installed on a 60-meter tower. An instrument elevator and 8-foot instrument booms are used to raise and lower the sensors for easier maintenance. These instruments provide indication to various points on the site including recorders within the Control Room. A total precipitation sensor and dew point sensor are located near the base of the Unit 1 meteorological tower. A processing computer is mounted at the base of the tower on a cabinet rack. This cabinet rack is located on a concrete pad that is approximately 10 feet wide and 5 feet deep. The meteorological tower for Units 2 and 3 is about 0.75 mile southwest of the center of the Unit 2 reactor building and 0.5 mile southwest of the center of the Unit 3 reactor building at an elevation of 435.5 feet above MSL. The tower-mounted sensors are as follows:

   a. At 60 meters above ground level, the upper wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-60 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   b. At 30 meters above ground level, the wind speed/direction sensors and relative humidity and the temperature are measured. The upper temperature sensor for the 10-30 meter differential temperature measurements are mounted on the 8-foot instrument boom.

   c. At 10 meter above ground level, the lower wind speed and wind direction sensors as well as the lower temperature sensor for the 10-60 and 10-30 meter differential temperature measurements and ambient temperature readings are mounted on the 8-foot instrument boom.

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Table 4-1 Radiation Monitoring Detectors

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VBS-RE003A	MCR Supply Air Duct (Gas)	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
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PSS-RE027	Containment Atmosphere N^{13}/F^{18}	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
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BDS-RE011	Steam Generator Blowdown Electrodeionization Brine	1 x 10^{-6} to 1 x 10^{-1} μCi/cc
CCS-RE001	Component Cooling Water System	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
SGS-RE026	Main Steam Line	1 x 10^{-1} to 1 x 10^{3} μCi/cc
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WGS-RE017	Gaseous Radwaste Discharge	1 x 10^{-5} to 1 x 10^{1} μCi/cc
VFS-RE101	Plant Vent Particulate	1 x 10^{-12} to 1 x 10^{-7} μCi/cc
VFS-RE102	Plant Vent Iodine	1 x 10^{-11} to 1 x 10^{-6} μCi/cc
VFS-RE103	Plant Vent Gas (Normal Range)	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
VFS-RE104A	Plant Vent Extended Range Gas (Accident Mid Range)	1 x 10^{-4} to 1 x 10^{2} μCi/cc
VFS-RE104B	Plant Vent Extended Range Gas (Accident High Range)	1 x 10^{-1} to 1 x 10^{5} μCi/cc
TDS-RE001	Turbine Island Vent Discharge	1 x 10^{-6} to 1 x 10^{5} μCi/cc
WLS-RE229	Liquid Radwaste Discharge	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
WWS-RE021	Waste Water Discharge	1 x 10^{-7} to 1 x 10^{-2} μCi/cc
VAS-RE001	Fuel handling Area Exhaust	1 x 10^{-6} to 1 x 10^{-1} μCi/cc
VAS-RE002	Auxiliary Building Exhaust	1 x 10^{-6} to 1 x 10^{-1} μCi/cc
VAS-RE003	Annex Building Exhaust	1 x 10^{-6} to 1 x 10^{-1} μCi/cc
VHS-RE001	Health Physics and Hot Machine Shop Exhaust	1 x 10^{-13} to 1 x 10^{-7} μCi/cc
VRS-RE023	Radwaste Building Exhaust	1 x 10^{-13} to 1 x 10^{-7} μCi/cc

Table 4-1 Radiation Monitoring Detectors (Continued)

Detector	Location	Range
Area Radiation Monitor Detection Parameters		
RMS-RE008	Primary Sampling Room	$1x10^{-1}$ to $1x10^{7}$ mR/hr
RMS-RE009	Containment Area – Personnel Hatch	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE010	Main Control Room	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE011	Chemistry Laboratory Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE012	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE013	Rail Car Bay Area/Auxiliary Bldg. Loading Bay	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE014	Liquid and Gaseous Radwaste Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE016	Control Support Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE017	Radwaste Bldg. Mobile Systems Facility	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE018	Hot Machine Shop	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE019	Annex Staging & Storage Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
RMS-RE020	Fuel Handling Area	$1x10^{-1}$ to $1x10^{4}$ mR/hr
PXS-RE160	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE161	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE162	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr
PXS-RE163	Containment High Range Monitor	$1x10^{0}$ to $1x10^{7}$ R/hr

Note: Information acquired from Westinghouse AP1000 Design Control Document Tier 2 Chapter 11.5.

1. Area Radiation Monitoring

   The area monitoring system provides information on existing radiation levels in various areas of the plant to ensure safe occupancy. It is equipped with Control Room and local readout and audible alarms to warn personnel of a raised radiation level.

2. Radiological Noble Gas Effluent Monitoring

   The wide range gas monitors are installed on normal station effluent release points. Each monitor system has a microprocessor which uses digital processing techniques to analyze data and control monitor functions. These monitors provide readout and alarm functions to the Control Room.

3. Radioiodine and Particulate Effluent Monitoring

   The wide range gas monitor includes a sampling rack for collection of the auxiliary building vent stack particulate and radioiodine samples. Filter holders and valves are provided to allow grab sample collection for isotopic analyses in the station's counting rooms. The sampling rack is shielded to minimize personnel exposure. The sampling media will be analyzed by a gamma ray spectrometer which uses a gamma spectrometer system. In addition, Silver Zeolite cartridges are available to further reduce the interference of noble gases.

4. High-Range Containment Radiation Monitors

   Two high-range containment radiation monitors are installed. The monitors will detect and measure the radiation level within the reactor containment during and following an accident. The range of the monitors is provided in Table 4-1.

5. In-plant Iodine Instrumentation

   Effective monitoring of increasing iodine levels in buildings under accident conditions will include the use of portable instruments using Silver Zeolite as a sample media. It is expected that a sample can be obtained, purged, and analyzed for iodine content within 2 hours.

C. Onsite Process Monitors

An adequate monitoring capability exists to properly assess the plant status for all modes of operation and is described in the Unit 2 and 3 FSAR. Instrumentation is available to monitor the parameters in Technical Specifications.

The unit's Emergency Operating Procedures assist personnel in recognizing inadequate core cooling using applicable instrumentation.

D. Seismic Monitors

Unit 3 has four triaxial acceleration sensor units and they are connected to a time-history analyzer. The time-history analyzer recording and playback system is located in a panel in the nuclear island in a room near the main control room. Seismic event data from these sensors is recorded on a solid-state digital recording system at 200 samples per second per data channel.

This solid-state recording and analysis system has internal batteries and a charger to prevent the loss of data during a power outage, and to allow data collection and analysis in a seismic event during which the power fails. Normally, 120-volt alternating current power is supplied from the non-Class 1E dc and uninterruptible power supply system. The system uses triaxial acceleration sensor input signals to initiate the time-history analyzer recording and main control room alarms. The system initiation value is adjustable from 0.002g to 0.02g.

The time-history analyzer starts recording triaxial acceleration data from each of the triaxial acceleration sensors after the initiation value has been exceeded. Pre-event recording time is adjustable from 1.2 to 15.0 seconds, and will be set to record at least 3 seconds of pre-event signal. Post-event run time is adjustable from 10 to 90 seconds. A minimum of 25 minutes of continuous recording is provided. Each recording channel has an associated timing mark record with 2 marks per second, with an accuracy of about 0.02 percent.

The sensor installation anchors are rigid so that the vibratory transmissibility over the design spectra frequency range is essentially unity.

Triaxial Acceleration Sensors

Each sensor unit contains three accelerometers mounted in a mutually orthogonal array with one horizontal axis parallel to the major axis assumed in the seismic analysis. The triaxial acceleration sensors have a dynamic range of 1000 to 1 (0.001 to 1.0g) and a frequency range of 0.2 to 50 hertz.

One sensor unit will be located in the free field.

A second sensor unit is located on the nuclear island basemat in the spare battery charger room at elevation 366'-6" near column lines 9 and L.

A third sensor unit is located on the shield building structure at elevation 566' near column lines 4-1 and K.

The fourth sensor unit is located on the containment internal structure on the east wall of the east steam generator compartment just above the operating floor at elevation 438' close to column lines 6 and K.

Seismic instrumentation is not located on equipment, piping, or supports since experience has shown that data obtained at these locations are obscured by vibratory motion associated with normal plant operation.

Also a South Carolina Seismic Network seismometer is located about 3.2 miles ESE of the VCSNS Unit 1. This seismometer near Jenkinsville has been operational since November 1973, and is monitored by the University of South Carolina. The South Carolina Seismic Network seismometer provides background information relative to seismic activity in the area, including confirmation of earthquake occurrences and magnitudes.

E. Onsite Fire Detection Instrumentation

The fire detection system is designed in accordance with applicable NFPA standards. The system is equipped with electrically supervised ionization smoke and heat detectors to quickly detect any fires and the instrumentation to provide local indication and control room annunciation. In addition to the smoke and heat detection systems, each fire protection carbon dioxide, halon, or water system is instrumented to inform the Control Room of its actuation or of system trouble.

In the event that a portion of the fire detection instrumentation is inoperable, fire watches in affected areas may be required.

Further details on the unit's fire detection system can be found in the FSAR and Fire Protection Plan.

F. Dose Projection Model

The dose assessment software system is comprised of a series of software components that function in a multi-tasked Windows environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a network connection. Reports are displayed on a color monitor and copies of screens can be made on a color printer. Also, reports can be sent via network connection to central control units.

Input data is available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules all runs from a GUI interface.

The dose assessment software and the data it uses are stored in pre-allocated files on the hard disk. The keyboard and mouse are used to make entries in response to prompts on the color monitor to initiate all calculations.

Dose calculations for flat terrain are made using a Gaussian plume model while a particle tracking model is used for more complex terrain environments.

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

All calculations are run from a master function menu with selections made using the system mouse.

Section 5: Emergency Measures

5.1 Unit Protective Actions

During emergencies, personnel in Unit 3 will be provided instruction by the Control Room or TSC regarding actions they are to take for their protection. Protective actions for site personnel range from take immediate cover, assembly, and evacuation of an area or the site. Protective actions will be issued by themselves or in combination based on the health and safety of site personnel. There are three distinct zones of the site that personnel may encounter when protective actions are issued. These zones include: Vital Area, Protected Area, and the Owner Controlled Area (OCA). Each of these zones has well-established entrance and exit points. These areas are well defined and presented in the SOT that is provided to each employee annually. Take immediate cover may be used in a security threat situation where there is little or no time to relocate personnel or in conjunction with a protective action to evacuate the Protected Area. Assembly may be used to move personnel into an area where they can be controlled and communicated with in an organized manner. Personnel may be held in the Assembly Area until personnel accountability has been established for each Protected Area. Personnel may be directed to evacuate the Protected Area or the site. If there is a need for personnel or vehicle monitoring after evacuation, personnel will be directed to an offsite assembly area for that activity. If necessary, decontamination will be conducted at the offsite holding area.

5.2 Unit Assembly Areas

The Unit 3 Assembly Area is located in the Nuclear Operations Building located north of the Unit 3 outside the Protected Area. During assembly, personnel will be provided information regarding the emergency and will be provided direction regarding their actions.

There are two designated Offsite Holding Areas available if it is determined that onsite personnel should be relocated offsite for further direction and/or monitoring of their vehicles. The primary offsite assembly area is the South Carolina Fire Academy (SCFA) located south of the Station on SC 215. Dependent on wind direction, the SCFA may not be feasible as an offsite assembly area. The lake recreation area located at the north end of the Monticello Reservoir will be used as the alternate offsite assembly area. Signs are posted outside of VCSNS to direct personnel to the designated locations.

The scope of the emergency will dictate the assembly area location, how personnel will be released from the area, and whether or not they will be able to return to their work spaces outside the Protected Area.

5.3 Unit Evacuation Routes

There are also two distinct exits from the OCA. The North access road and the South access road provides entry and exit from the OCA in the event of an emergency. The use of these entry and exit points is determined based on radiological conditions and wind direction. Access to the OCA is controlled at these locations during a declared emergency of Alert or higher classification.

Appendix 1 - References

American Nuclear Insurers (ANI) Bulletin #5B	Accident Notification Procedures for Liability Insured, 1981
EPA-400-R-92-001	Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
FEMA-REP-10, Section E.6.2.1	Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants, November 1985
NEI 99-01, Revision 5	Methodology for Development of Emergency Action Levels
NEI 07-01, Revision 0	Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors
NRC Bulletin 2005-02	Emergency Preparedness and Response Actions for Security-Based Events, July 18, 2005
NRC Bulletin 80-15	Possible Loss of Emergency Notification System (ENS) with Loss of Offsite Power, June 18, 1980
NRC Generic Letter 91-14	Emergency Telecommunications, September 23, 1991
NRC Information Notice 85-44	Emergency Communication System Monthly Test, May 30, 1985
NRC Regulatory Guide 1.101	Emergency Planning and Preparedness for Nuclear Power Reactors, Revision 3, August 1992
NRC RTM-96	Response Technical Manual, March 1996
NUREG- 0696	Functional Criteria for Emergency Response Facilities
NUREG/BR-0230, RCM-96	Response Coordination Manual, 1996
NUREG-0654/FEMA-REP-1 Rev. 1	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
NUREG-0728	Incident Response Plan, June 1987
NUREG-0737	Clarification of TMI Action Plan Requirements
Regulatory Issue Summary 2004-13	Consideration of Sheltering in Licensee's Range of Protective Action Recommendations, August 2, 2004
VCSNS Unit 1 Final Safety Analysis Report	
VCSNS Unit 2 and 3 Final Safety Analysis Report	
VCSNS Security Plan	
VCSNS Offsite Dose Calculation Manual	

Appendix 2 - Letters of Agreement

VCSNS maintains Letters of Agreement and/or Memorandums of Understanding with the following:

The state of South Carolina, Emergency Management Division (This letter includes the South Carolina Department of Health and Environmental Control.)

The County of Newberry

The County of Lexington

The County of Richland

The County of Fairfield

Fairfield County Emergency Medical Services

Lexington County Emergency Medical Services

The Department of Energy, Savannah River Office

Palmetto Health Richland Memorial Hospital

Radiation Emergency Assistance Center/Training Site, DOE, Oak Ridge, TN

Pinner Clinic

The Institute of Nuclear Power Operations

Jenkinsville — Monticello — Horeb Volunteer Fire Department

Greenbrier — Bethel Volunteer Fire Department

Blair Volunteer Fire Department

Feasterville Volunteer Fire Department

Lebanon Volunteer Fire Department

Community Volunteer Fire Department

Columbia Metropolitan Airport Fire and Rescue

South Carolina Fire Marshal's Office/South Carolina Fire Academy

NC Department of Crime Control and Public Safety – Div of Emergency Management

Letters of Agreement and/or Memorandums of Understanding are reviewed annually, updated as required, and certified. Current copies are retained in the Contract License and Permit Tracking System (CLP).

Appendix 3 – List of Emergency Plan Procedures

Implementing Procedures	Plan Section Implemented
Activation and Implementation of Emergency Plan (EPP-001)	Part II Sections B & D
Unusual Event (EPP-001.1)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
Alert (EPP-001.2)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
Site Area Emergency (EPP-001.3)	Part II Sections H, D.1, E.2 & G.3; Annex 1 Section 3
General Emergency (EPP-001.4)	Part II Sections H, D.1, E.2 G.3 & J; Annex 1 Section 3
Communication and Notification (EPP-002)	Part II Sections E & F
Plant Radiological Surveying (EPP-003)	Part II Section H.6, 7, & 8
Offsite Dose Calculation (EPP-005)	Part II Section I; Annex 1 F
Core Damage Assessment Methodology (CP-308)	Part II Section I.3
Technical Support Center (EPP-023)	Part II Sections A, B, C, & H
Operational Support Center (EPP-028)	Part II Sections A, B, K, H, & M; Annex 1 Section 4.B
Emergency Operations Facility (EPP-051)	Part II Sections A, B, C, H, & K
Emergency Information Plan (EPP-052)	Part II Sections A, B, & H
Onsite Personnel Accountability and Evacuation (EPP-012)	Part II Sections D, J: Annex 1 Sections 4.B & 5.1
Environmental Monitoring (EPP-007)	Part II Sections C.2, H, & I
Onsite Medical (EPP-009)	Part II Section L
Post Recovery and Reentry (EPP-017)	Part II Section M
Personnel/Vehicle Decontamination (EPP-010)	Part II Sections H.5 & K.1; Annex 1
Personnel Search and Rescue (EPP-011)	Part II Section J.5
Fire Emergency (EPP-013)	Part I Section H; Part II Section I; Annex 1 Section D
Toxic Release (EPP-014)	Part I Section H
Natural Emergency (EPP-015)	Part I Section H
Emergency Personnel Exposure Control (EPP-020)	Part II Section K
Activation of the Early Warning Siren System (EPP-021)	Part II Section E.6
Hostile Action (EPP-027)	Part I Section H; Part II Section D; Appendix 4

Administrative Procedures	Plan Section Reference
Emergency Preparedness (SAP-0127)	Part II Section P
Emergency Equipment Checklists (EPP-103)	Part II Section H; Annex 1
Verification of Communications Operability (EPP-104)	Part II Section F
Conduct of Drills and Exercises (EPP-105)	Part II Section N
Emergency Preparedness Performance Indicator Procedure (EPP-106)	Part I
Conduct of Fire Brigade Drills (EPP-107)	Part II Section N.2
Emergency Action Level Technical Basis Document (EPP-108)	Part II Section D; Annex 1
Equipment Related to Emergency Preparedness (EPP-109)	Annex 1
Emergency Action Level Reference Manual (EPP-110)	Part II Section D; Annex 1
Emergency Preparedness Oversight Committee (EPP-111)	Part I
Maintenance of the Early Warning Siren System (EWSS) (EPMP-100)	Part II Section E.6
General Employee Training Emergency Plan Training and Drills (TQP-0605)	Part II Section O
Emergency Planning Telephone Directory	Part II Section P.10
Offsite Dose Calculation Manual (ODCM)	Part II H & I; Annex 1
Evacuation Time Estimate (ETE)	Part II Section J.8; Appendix 5
On-shift Staffing Analysis	Part 2 Section B and Table B-1a; Annex 1 Table 2-1 and Section 2.2

Appendix 4 - Abbreviations, Acronyms and Definitions

Accident (Incident or Event)	An unintentional or unexpected event resulting in radiological exposure, physical injury, or physical damage to property.
ALARA	(As Low As Reasonably Achievable) A radiation protection philosophy requiring that personnel exposure to radiation and radioactive material be kept not only within regulatory limits but be maintained As Low As Reasonably Achievable in the light of current technology with appropriate consideration for economic and social factors and for the benefits to be expected. ALARA applies not only to minimizing occupational exposure to radiation workers, but also to limiting the radioactivity of plant effluent and minimizing the potential for exposure to the public.
Annual (Annually)	At least once per 365 days ± 90 days, unless specifically identified as "based on a calendar year".
ANI	American Nuclear Insurers
ANS	Alert and Notification System
CDE	(Committed Dose Equivalent) Total Dose from internally deposited radionuclide over subsequent 50 year period to a specific organ.
CEDE	(Committed Effective Dose Equivalent) Sum of risk-weighted Committed Dose Equivalents to organs.
Certified	Official approval by written letter from the EP Manager verifying the items(s) to be accurate and up to date
CET	Core Exit Thermocouple
CFR	(Code of Federal Regulations) The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the federal government. The Code is divided into 50 titles that represent broad areas subject to federal regulation. Each title is divided into chapters that usually bear the name of the issuing agency. Each chapter further subdivided into parts covering specific regulatory areas.
Cold Shutdown	A reactor condition in which the coolant temperature has been reduced to 200°F or below and the pressure has essentially been reduced to atmospheric pressure. This is also known as Mode 5.
CA	(Contaminated Area) An area where radioactive material is deposited where it is not desired.
CR	Control Room
DAC	(Derived Air Concentration) The concentration of a given radionuclide in air.
DDE	(Deep Dose Equivalent) Dose equivalent from external radiation at a tissue depth of 1 centimeter.
DEP	Drill/Exercise Performance
DHEC (SCDHEC)	Department of Health and Environmental Control (SC)
DHS	Department of Homeland Security (US)
DOE	Department of Energy (US)

Dose (Radiation)	The quantity of radiation absorbed per unit of mass by the body or by any portion of the body. The unit of radiation dose is the RAD.
Dose Equivalent	Quantity that expresses all radiations on a common scale for calculating the absorbed dose. It is defined as the product of the absorbed dose in rads and certain modifying factors. The unit is rem.
Dose Rate	Dose delivered per unit time.
Dosimeter	An instrument used for measuring the absorbed dose, exposure, or similar radiation quantity.
Dosimetry	A system of dosimeters for evaluating the absorbed dose, exposure, or similar radiation quantity.
DNR (SCDNR)	Department of Natural Resources (SC)
EAB	Exclusion Area Boundary (Nuclear Exclusion Area)
EALs	Emergency Action Levels
EAS	(Emergency Alert System) A network of broadcast stations and interconnecting facilities authorized by the Federal Communications Commission to operate in a controlled manner during a war, state of public peril, disaster or other national, state and local emergencies.
ECO	Emergency Control Officer
ED	Emergency Director
EMD (SCEMD)	Emergency Management Division (SC)
ENF	(Emergency Notification Form) A template form provided by the State of SC for the purpose of disseminating information to offsite agencies regarding an emergency.
ENS	Emergency Notification System
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPIO	Emergency Public Information Organization
EPIP	(Emergency Plan Implementing Procedure) Detailed procedures which provide guidance to individuals and groups for implementation of the provisions of the emergency plan.
EPRI	Electric Power Research Institute
EPZ	(Emergency Planning Zone) A generic area defined about a nuclear facility to facilitate offsite emergency planning and develop a significant response base. It is defined for the plume and ingestion exposure pathways.
ERDS	Emergency Response Data System
ERF	Emergency Response Facilities
ERO	Emergency Response Organization
ESSX	Electric Switch System Exchange
ETE	Evacuation Time Estimate
Evacuation	The removal of people from an area on an emergency basis to avoid or reduce possible short term radiation exposure.
Exposure	Being exposed to ionizing radiation, radioactive materials, or other hazardous substances.
External Dose	Dose from a source of radioactive material outside the body.

FBI	Federal Bureau of Investigation
FCEMS	Fairfield County Emergency Medical Services
FEMA	Federal Emergency Management Agency
HEPA	High-efficiency particulate air filter
Frisker	Radiation monitoring equipment. This is a hand-held probe that is slowly passed near the area of interest to determine the presence or absence of radioactive material.
FRMAP	Federal Radiation Monitoring and Assessment Plan
FSAR	Final Safety Analysis Report
Gamma Rays	High-energy, short-wavelength electromagnetic radiation. Gamma rays are essentially similar to x-rays, but are usually more energetic and are nuclear in origin.
HP	(Health Physics) A general term used as a modifying phrase that may refer to facilities, equipment, programs, etc. used in the discipline of Health Physics. A profession devoted to the protection of man and his environment from unwarranted radiation exposure.
HRA	(High Radiation Area) Any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a dose equivalent could be received in any one hour in excess of 100 millirem, but less than 1000 millirem at 30 centimeters.
HOSTILE ACTION	An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, takes hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the Owner Controlled Area.)
Hostile Force	One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.
HPN	Health Physics Network
HSOC	Homeland Security Operations Center
I&C	Instrument and Controls
IED	Interim Emergency Director
Ingestion Exposure Pathway	The means of ingesting radioactive fallout from the plume through the consumption of food or water with a 10 – 50 mile radius of the site.

INPO	(Institute of Nuclear Power Operations) An organization established by the utilities to set up standardized operations. By Letter of Agreement, INPO agrees to provide the service provided by their organization, coordinate the activities of the organization and provide telephone contacts of the organization during an emergency at the Station.
Internal Dose	Dose from a source of radioactive material within the body (as a result of deposition of radionuclides in body tissue).
Ionization Chamber	An instrument that detects and measures ionizing radiation by measuring the electrical current that flows when radiation ionizes gas in a chamber, making the gas a conductor of the electricity.
JIC	(Joint Information Center) A center set up in a central location where public information officers from the involved agencies come together to ensure coordination of information to be released to the media and the public. This center becomes the central point for media access to latest developments and emergency information. All information released is coordinated among the agencies involved to ensure its consistency and accuracy. This may also be referred to as the News Media Area.
KI	Potassium Iodide
LCEMS	Lexington County Emergency Medical Services
Liquid Effluent Stream	Processed liquid wastes containing radioactive materials resulting from the operation of a nuclear power reactor.
LOCA	(Loss of Coolant Accident) A loss of coolant accident can result from an opening in the primary cooling system, such as a pipe break or a stuck open relief valve.
Low Population Zone	The area which surrounds the exclusion zone and includes populations from the site out to three miles from the Unit 1 Reactor Building.
MSL	Mean Sea Level
MERT	Medical Emergency Response Team
Monitor, Radiation	A radiation detector whose purpose is to measure the level of ionizing radiation (or quantity of radioactive material).
Monitoring	The continuous or periodic collection and assessment of pertinent information.
Monthly	At least once per 31 days $\pm$ 7 days
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC (USNRC)	Nuclear Regulatory Commission (US)
NRF	National Response Framework
NSSS	Nuclear Steam Supply System
NUREG-0654/FEMA REP1, Rev 1	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants: The purpose of this guidance and upgraded acceptance criteria is to provide a basis for NRC licensees, and State and local governments to develop radiological emergency plans and improve emergency preparedness.
NWS	National Weather Service

Occupational Dose	A dose received by a permanent or temporary employee while engaged in activities relating to the use, possession, or surveillance of licensed radioactive material or sources of ionizing radiation. Occupational dose shall not include any exposure of an individual to radiation for the purpose of medical diagnosis or therapy. Determination of occupational dose is the responsibility of the licensee.
OCA	(Owner Controlled Area) The area bounded by the Protected Area on the inside and by the Primary Vehicle Barrier System (VBS) on the outside.
OEM	Offsite Emergency Manager
ORMC	Offsite Radiological Monitoring Coordinator
OSC	Operational Support Center
PA	(Protected Area) the area immediately surrounding the nuclear station encompassed by physical barriers (double fence) and access to which is controlled for nuclear security purposes.
PAD	Protective Action Directives
PAG	(Protective Action Guidelines) Projected total effective dose equivalent or committed dose equivalent values to individuals in the general population that warrant protective action following a release of radioactive materials. Protective actions would be warranted provided the reduction in individual dose expected to be achieved by carrying out the protective action is not offset by excessive risks to individual safety in taking the protective actions.
PAR	Protective Action Recommendations
PBX	Private Branch Exchange
Personnel Monitoring Equipment	Devices designed to be worn or carried by an individual for the purpose of measuring occupational radiation doses, e.g. thermo luminescent dosimeters, pocket dosimeters, and finger badges.
PI&R	Problem Identification & Resolution
Plume Exposure Pathway	The principal exposure sources from this pathway are: External exposure to gamma radiation from the plume and from deposited materials Inhalation exposure from the passing radioactive plume.
Pocket Dosimeter	An ionization chamber carried or worn by an individual for personnel dose monitoring.
Portal Monitor	A walk-through radiation detector whose purpose is to detect beta and gamma emitting contamination on personnel exiting selected areas.
Posted Area	An area in which radiation and/or contamination exists or might exist at levels such that the use of warning signs or devices is required.
PPE	Personal Protective Equipment
Projected Dose	An estimate of the radiation dose that affected individuals could potentially receive if protective actions are not taken.

PF	(Protection Factor) A measure of the protection afforded by a respirator; the ratio of the concentration of the radionuclide in the ambient atmosphere to the concentration inside the respiratory equipment (usually inside the facepiece) under conditions of use.
Protective Action	Those emergency measures taken before or after an uncontrolled release of radioactive material has occurred for the purpose of minimizing radiological exposure to individuals. Also, measures that can be taken for the physical protection of plant personnel from a security or other hazards event.
Protective Clothing	Used interchangeably with the term anti-contamination clothing and has the same general meaning in radiation protection procedures.
QAPD	Quality Assurance Program Description
Quarterly	At least once per 92 days $\pm$ 23 days
Rad	A measure of the dose produced by directly or indirectly ionizing radiation in terms of the energy absorbed per unit mass of any irradiated material. One rad is the dose corresponding to 100 ergs of absorbed energy per gram of irradiated material.
Radiation, Ionizing	Any or all of the following: alpha, beta, gamma, X-rays, neutrons, high speed protons or electrons, and other atomic particles (sound, radio waves, visible, and infrared or ultraviolet light are non-ionizing forms of radiation).
RA	(Radiation Area) Any area, accessible to personnel, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 millirem, but less than 100 millirem in 1 Hour at 30 centimeters.
Radiation Exposure	Refers very broadly to the act or state of being exposed to ionizing radiation.
Radiation Protection	Used interchangeably with the term health physics.
RWP	(Radiation Work Permit) A document providing radiological evaluation and authorization to perform specific activities involving personnel exposure to ionizing radiation or radioactive material. It describes the radiological conditions and specifies radiation protection controls to be used when performing the activities.
Radioactive Contamination	The presence of radioactive material in an undesired location. Contamination may be loose, fixed, or present in air.
Radionuclide	A radioactive nuclide is one that has the capability of spontaneously emitting radiation.
RCS	(Reactor Coolant System or Primary Coolant) The fluid circulated through the reactor to remove heat.
REAC/TS	Radiation Emergency Assistance Center/Training Site
Reactor Trip (SCRAM)	An automatic procedure by which control rods are rapidly inserted into the core of a reactor to stop the chain reaction.
Recovery	The process of reducing radiation exposure rates and concentrations in the environment to acceptable levels for unconditional occupancy.

Relocation	The removal or continued exclusion of people from contaminated areas to avoid chronic radiation exposure.
Rem	Special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rads multiplied by the quality factor.
RMS	Radiation Monitoring System
RVLIS	Reactor Vessel Level Indication System
SAMGs	Severe Accident Management Guidelines
SCBA	Self contained breathing apparatus
SCE&G	South Carolina Electric & Gas
SCSN	South Carolina Seismic Network
Secondary Coolant	A separate stream of coolant that is converted to steam by the primary coolant in a heat exchanger (steam generator) to power the turbine.
SRPD	(Self-Reading Pocket Dosimeter) A self-reading dosimeter is a direct-reading pocket dosimeter shaped like a pen with a pocket clip. It is generally used to measure X and gamma radiation.
Semi-annually	At least once per 184 days $\pm$ 46 days
Severe Accident: PWR	A nuclear accident involving a loss of core cooling and damage so severe that there are core geometry changes and possible relocation of core materials, e.g. a core melt. In accordance with the Severe Accident Management Guidelines, a severe accident has occurred when core exit thermocouple temperatures are greater than 1200 degrees F and actions to cool the core have been, and continue to be, unsuccessful. The plant is outside of the Design Bases for the station.
SHELTER	The use of the closest available structure that will provide protection from exposure to an airborne plume.
SLED	South Carolina Law Enforcement Division
SOT	Station Orientation Training
SPDS	Safety Parameter Display Systems
SRO	Senior Reactor Operator
STA	Shift Technical Advisor
START	Simple Triage and Rapid Treatment
TEDE	(Total Effective Dose Equivalent) Sum of the deep dose equivalent and the committed effective dose equivalent.
TLD	(Thermo Luminescent Dosimeter) A dosimeter based on the effect of ionizing radiation on certain thermo luminescent crystals, in which radiation excites orbital electrons of some atoms to a higher energy state orbit than normal. Stimulating the crystal by controlled heating allows the electrons to return to normal orbit, thereby emitting discrete quanta of light proportional to the amount of ionizing radiation absorbed by the crystal. Emitted light can be measured and related to personnel dose from ionizing radiation.
TSC	Technical Support Center
USCG	U.S. Coast Guard
VBS	(Vehicle Barrier System) security barrier delineated by the large rocks and vehicle search areas

VCSNS (VCS)	V.C. Summer Nuclear Station
Weekly	At least once per 7 days $\pm$ 2 days
X-Ray	Highly penetrating radiation similar to gamma rays.

Appendix 5 - Evacuation Time Estimate Study

The Evacuation Time Estimate Study was prepared by KLD Associates, Inc. This controlled document, in its entirety, is filed under separate cover and has been distributed to designated locations.

Appendix 6 - Regulatory Requirements Cross Reference Document

Table No.	Regulatory Requirement
1	10 CFR 50 App. E
2	10 CFR 50.47
3	NUREG-0654

Table 1 – 10 CFR 50 Appendix E – Emergency Planning and Preparedness for Production and Utilization Facilities

REGULATION	STATEMENT	EPLAN	COMMENTS
IV A.	The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization	B.1, B.5	
IV A.	and the means for notification of such individuals in the event of an emergency.	E.2	
IV A.1	A description of the normal plant operating organization.	B.1	
IV A.2.a	A description of the onsite emergency response organization with a detailed discussion of: Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;	B.2, B.3, B.5	
IV A.2.b	Plant staff emergency assignments;	B.5	
IV A.2.c	Authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.	B.2, B.4	
IV A.3	A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.	B.5.c, B.7	
IV A.4	Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.	B.5.b.2, 3, 4, 5,& 6	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV A.5	Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.	A.3	
IV A.6	A description of the local offsite services to be provided in support of the licensee's emergency organization.	L.1, 2, 3, 4	
IV A.7	Identification of, and assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.	C.1, 2, 3, 4	
IV A.8	Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.	J.9	
IV A.9	A detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the time performance of their assigned functions as specified in the emergency plan.	Appendix 7	
IV B	The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described,	I.2, I.3, I.4, I.5, I.6, I.7, I.8, I.9, I.10	
IV B (continued)	including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies,	Annex 1, 2, & 3, E.2, E.3, E.4	
IV B (continued)	and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety.	Annex 1, 2, & 3, J.7, J.9, J.10	
IV B (continued)	The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring and shall include hostile actions.	Annex 1, 2, & 3, 3.2, N.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV B (continued)	These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by NRC.	D.2	
IV B (continued)	They shall also be discussed and agreed upon by the State and local governmental authorities and the NRC. They must be reviewed on an annual basis with State and local governments.	D.3	
IV C.1	The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described.	D.1	
IV C.1 (continued)	The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described.	E.2	
IV C.1 (continued)	Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described.	Annex 1, 2, & 3	
IV C.1 (continued)	The existence, but not the details, of a message authentication scheme shall be noted for such agencies.	E.1	
IV C.1 (continued)	The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG - 0654; FEMA - REP - 1.	D.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV C.2	Shall establish and maintain the capacity to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.	Part 1 Section 3, Annex 1, 2, & 3 Section 3	
IV D.1	Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.	E.3, E.4	
IV D.2	Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.	G.1, G.2	
IV D.3	A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency.	E.2.b.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV D.3 (continued)	The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this notification capability will range from immediate notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental officials to make a judgment whether or not to activate the public notification system.	E.6	
IV D.3 (continued)	The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15-minute design objective for the primary prompt public alert and notification system.	E.6	
IV D.3 (continued)	When there is a decision to activate the notification system, the State and local officials will determine whether to activate the entire notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public notification system shall remain with the appropriate governmental authorities.	E.6	
IV D.4 (continued)	FEMA approved nuclear power reactor site's alert and notification design report, including the backup alert and notification		
IV E.1	Adequate provisions shall be made and described for emergency facilities and equipment, including: Equipment at the site for personnel monitoring;	H.1, H.2, H.5	
IV E.2	Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment;	H.5.b, H.5.d	
IV E.3	Facilities and supplies at the site for decontamination of onsite individuals;	H.5.b, H.5.c	
IV E.4	Facilities and medical supplies at the site for appropriate emergency first aid treatment;	L.2	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV E.5	Arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site;	L.3	
IV E.6	Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;	L.3	
IV E.7	Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary;	L.1	
IV E.8.a & b	A licensee onsite technical support center and an emergency operations facility (located between 10 miles and 25 miles of the site) from which effective direction can be given and effective control can be exercised during an emergency; and a licensee onsite operational support center	H.1, H.2	
IV E.8.c	The EOF will have the following capabilities: (1) The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; (2) The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves;	H.2	
IV E.8.d	For nuclear power reactor licensees, an alternative facility (or facilities) that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and collectively having the following characteristics: the capability for communication with the emergency operations facility, control room, and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation, for use when onsite emergency facilities cannot be safely accessed during hostile action.	H.1.b, H.1.c	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV E.9	At least one onsite and one offsite communications system; each system shall have a backup power source. All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication.	F.1	
IV E.9.a	Where consistent with the function of the governmental agency, these arrangements will include: Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.	N.2	
IV E.9.b	Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.	N.2	
IV E.9.c	Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.	N.2	
IV E.9.d	Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility. Such communications shall be tested monthly.	N.2	
IV F.1 & 1.i	The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel: Directors and/or coordinators of the plant emergency organization;	O.2 O.4.a	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.1.ii	Personnel responsible for accident assessment, including control room shift personnel;	O.4.b	
IV F.1.iii	Radiological monitoring teams;	O.4.c	
IV F.1.iv	Fire control teams (fire brigades);	O.4.d	
IV F.1.v	Repair and damage control teams;	O.4.e	
IV F.1.vi	First aid and rescue teams;	O.4.f	
IV F.1.vii	Medical support personnel;	O.4.h	
IV F.1.viii	Licensee's headquarters support personnel;	O.4.i	
IV F.1.ix	Security personnel.	O.4.d.2	
IV F.1	In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.	O.4.g, G.5, P.3	
IV F.2	The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties.	N.1	
IV F.2.a	A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located. Nuclear power reactor licensees shall submit exercise scenarios under §50.4 at least 60 days before use in a full participation exercise	N.1	
IV F.2.b	Each licensee at each site shall conduct an exercise of its onsite emergency plan every 2 years. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section. In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities.	N.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.2.c	Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period.	N.1	
IV F.2.d	A State should fully participate in the ingestion pathway portion of exercises at least once every six years. In States with more than one site, the State should rotate this participation from site to site.	N.1 a	
IV F.2.d (continued)	Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise	Not addressed in the VCSNS Emergency Plan	Offsite Responsibility
IV F.2.e	Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.	N.1.b	
IV F.2.f	Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency or determined that the ERO has maintained key skills specific to emergency response. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.	N.1.a	
IV F.2.g	All exercises, drills, and training that provide performance opportunities to develop, maintain, or demonstrate key skills must provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified in a critique of exercises, drills, or training must be corrected.	N.4, N.5	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV F.2.h	The participation of State and local governments in an emergency exercise is not required to the extent that the applicant has identified those governments as refusing to participate further in emergency planning activities, pursuant to 10 CFR 50.47(c)(1). In such cases, an exercise shall be held with the applicant or licensee and such governmental entities as elect to participate in the emergency planning process.	N/A	
IV F.2.i	Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action. Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.	N.1, N.2	
IV F.2.j	The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section. Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center. Additionally, in each eight calendar year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements: hostile action directed at the plant site, no radiological release or an unplanned minimal radiological release that does not require public protective actions, an initial classification of or rapid escalation to a Site Area Emergency or General Emergency, implementation of strategies, procedures, and guidance developed under § 50.54(hh)(2), and integration of offsite resources with onsite response. The licensee shall maintain a record of exercises conducted during each eight year exercise cycle that documents the content of scenarios used to comply with the requirements of this paragraph.	N	
IV G	Provisions to be employed to ensure that the emergency plan, its implementing procedures, and emergency equipment and supplies are maintained up to date shall be described.	P.3	

REGULATION	STATEMENT	EPLAN	COMMENTS
IV H	Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed shall be described.	M.1.a	
IV I	a range of protective actions to protect onsite personnel during hostile action must be developed to ensure the continued ability of the licensee to safely shut down the reactor and perform the functions of the licensee's emergency plan		

Table 2 – 10 CFR 50.47 Emergency Plans

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 1	Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned,	A.1	
(b) 1 (continued)	the emergency responsibilities of the various supporting organizations have been specifically established,	A.1	
(b) 1 (continued)	and each principal response organization has staff to respond and to augment its initial response on a continuous basis.	A.4	
(b) 2	On-shift facility licensee responsibilities for emergency response are unambiguously defined,	B.1	
(b) 2 (continued)	adequate staffing to provide initial facility accident response in key functional areas is maintained at all times,	Appendix 7	
(b) 2 (continued)	timely augmentation of response capabilities is available	B.5.a	
(b) 2 (continued)	and the interfaces among various onsite response activities and offsite support and response activities are specified.	Figure A-2	
(b) 3	Arrangements for requesting and effectively using assistance resources have been made,	A.3	
(b) 3 (continued)	arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made,	C.2	
(b) 3 (continued)	and other organizations capable of augmenting the planned response have been identified.	C.4	
(b) 4	A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee,	D.1	
(b) 4 (continued)	and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	E.2.b	
(b) 5	Procedures have been established for notification, by the licensee, of State and local response organizations	E.2.b	
(b) 5 (continued)	and for notification of emergency personnel by all organizations;	E.2	
(b) 5 (continued)	the content of initial and follow up messages to response organizations and the public has been established;	E.3, E.4	

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 5 (continued)	and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.	E.6	
(b) 6	Provisions exist for prompt communications among principal response organizations to emergency personnel	F.1	
(b) 6 (continued)	and to the public.	G.4	
(b) 7	Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors),	G.1	
(b) 7 (continued)	the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance,	G.2	
(b) 7 (continued)	and procedures for coordinated dissemination of information to the public are established.	G.3, G.4	
(b) 8	Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	H.1, H.2, H.3	
(b) 9	Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	I	
(b) 10	A range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public.	J	
(b) 10 (continued)	Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place,	J.10.m.1, Figure J-2	
(b) 10 (continued)	Evacuation time Estimates have been developed and shall be updated on a periodic basis	Appendix 5	
(b) 10 (continued)	and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	J.11	
(b) 11	Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.	K.1	

REGULATION	STATEMENT	EPLAN	COMMENTS
(b) 12	Arrangements are made for medical services for contaminated injured individuals.	L.1	
(b) 13	General plans for recovery and reentry are developed.	M.1	
(b) 14	Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities,	N.1, N.2	
(b) 14 (continued)	periodic drills are (will be) conducted to develop and maintain key skills,	N.2	
(b) 14 (continued)	and deficiencies identified as a result of exercises or drills are (will be) corrected.	N.5	
(b) 15	Radiological emergency response training is provided to those who may be called on to assist in an emergency.	O.1, O.2, O.3, O.4, O.5	
(b) 16	Responsibilities for plan development and review and for distribution of emergency plans are established,	P	
(b) 16 (continued)	and planners are properly trained.	P.1	

Table 3 – NUREG-0654 Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
A.1.a	Each plan shall identify the State, local, Federal and private sector organizations (including utilities), that are intended to be part of the overall response organization for Emergency Planning Zones. (See Appendix 5).	A.1	
A.1.b	Each organization and sub organization having an operational role shall specify its concept of operations, and its relationship to the total effort.	A.1	
A.1.c	Each plan shall illustrate these interrelationships in a block diagram.	A.1, Figure A-2	
A.1.d	Each organization shall identify a specific individual by title who shall be in charge of the emergency response.	A.1	
A.1.e	Each organization shall provide for 24-hour per day emergency response, including 24-hour per day manning of communications links.	A.1	
A.2.a	Each organization shall specify the functions and responsibilities for major elements and key individuals by title, of emergency response, including the following: Command and Control	A.2	Offsite Responsibility
A.2.a (continued)	Alerting and Notification		Offsite Responsibility
A.2.a (continued)	Communications		Offsite Responsibility
A.2.a (continued)	Public Information		Offsite Responsibility
A.2.a (continued)	Accident Assessment		Offsite Responsibility
A.2.a (continued)	Public Health and Sanitation		Offsite Responsibility
A.2.a (continued)	Social Services		Offsite Responsibility
A.2.a (continued)	Fire and Rescue		Offsite Responsibility
A.2.a (continued)	Traffic Control		Offsite Responsibility
A.2.a (continued)	Emergency Medical Services		Offsite Responsibility
A.2.a (continued)	Law Enforcement		Offsite Responsibility
A.2.a (continued)	Transportation		Offsite Responsibility
A.2.a (continued)	Protective Response (including authority to request Federal assistance and to initiate other protective actions), and		Offsite Responsibility
A.2.a (continued)	Radiological Exposure Control.		Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
A.2.a (continued)	The description of these functions shall include a clear and concise summary such as a table of primary and support responsibilities using the agency as one axis, and the function as the other. (See Section B for licensee).		Offsite Responsibility
A.2.b	Each plan shall contain (by reference to specific acts, codes or statutes) the legal basis for such authorities.		Offsite Responsibility
A.3	Each plan shall include written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the Emergency Planning Zones. The agreements shall identify the emergency measures to be provided and the mutually acceptable criteria for their implementation, and specify the arrangements for exchange of information. These agreements may be provided in an appendix to the plan or the plan itself may contain descriptions of these matters and a signature page in the plan may serve to verify the agreements. The signature page format is appropriate for organizations where response functions are covered by laws, regulations or executive orders where separate written agreements are not necessary.	A.3	
A.4	Each principal organization shall be capable of continuous (24-hour) operations for a protracted period.	A.4	
A.4 (continued)	The individual in the principal organization who will be responsible for assuring continuity of resources (technical, administrative, and material) shall be specified by title.	A.4	
B.1	Each licensee shall specify the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement.	B.1	
B.2	Each licensee shall designate an individual as emergency coordinator who shall be on shift at all times and who shall have the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations to authorities responsible for implementing offsite emergency measures.	B.2	
B.3	Each licensee shall identify a line of succession for the emergency coordinator position and identify the specific conditions for higher level utility officials assuming this function.	B.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
B.4	Each licensee shall establish the functional responsibilities assigned to the emergency coordinator and shall clearly specify which responsibilities may not be delegated to other elements of the emergency organization.	B.4	
B.4 (continued)	Among the responsibilities which may not be delegated shall be the decision to notify and to recommend protective actions to authorities responsible for offsite emergency measures.	B.4	
B.5	Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1. The implementation schedule for licensed operators, auxiliary operators and the shift technical advisor on shift shall be as specified in the July 31, 1980 letter to all power reactor licensees. Any deficiencies in the other staffing requirements of Table B-1 must be capable of augmentation within 30 minutes by September 1, 1981, and such deficiencies must be fully removed by July 1, 1982.	B.5	
B.6	Each licensee shall specify the interfaces between and among the onsite functional areas of emergency activity, licensee headquarters support, local services support, and State and local government response organization.	B.6	
B.6 (continued)	This shall be illustrated in a block diagram and shall include the onsite technical support center and the operational support (assembly) center and the licensee's near-site Emergency Operations Facility (EOF)	B.6, Figure B-1.a, Annex Tables 2-1	
B.7	Each licensee shall specify the corporate management, administrative, and technical support personnel who will augment the plant staff as specified in the table entitled "Minimum Staffing Requirements for Nuclear Power Plant Emergencies," (Table B-1) and in the following areas:	B.5, Figure B-1.a, Annex Tables 2-1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
B.7.a	a. logistics support for emergency personnel, e.g., transportation, communications, temporary quarters, food and water, sanitary facilities in the field, and special equipment and supplies procurement;	B.5	
B.7.b	b. technical support for planning and reentry/recovery operations;	M.2	
B.7.c	c. management level interface with governmental authorities; and	B.5	
B.7.d	d. release of information to news media during an emergency (coordinated with governmental authorities).	G.4	
B.8	Each licensee shall specify the contractor and private organizations who may be requested to provide technical assistance to and augmentation of the emergency organization.	B.8	
B.9	Each licensee shall identify the services to be provided by local agencies for handling emergencies, e.g., police, ambulance, medical, hospital, and fire-fighting organizations shall be specified.	B.8	
B.9 (continued)	The licensee shall provide for transportation and treatment of injured personnel who may also be contaminated.	L.3	
B.9 (continued)	Copies of the arrangements and agreements reached with contractor, private, and local support agencies shall be appended to the plan. The agreements shall delineate the authorities, responsibilities, and limits on the actions of the contractor, private organization, and local services support groups.	B.8, Appendix 2	
C.1.a	The Federal government maintains in-depth capability to assist licensees, States and local governments through the Federal Radiological Monitoring and Assessment Plan (formerly Radiological Assistance Plan (RAP) and Interagency Radiological Assistance Plan (IRAP).* Each State and licensee shall make provisions for incorporating the Federal response capability into its operation plan, including the following: ** FEMA issued the Federal Radiological Emergency Response Plan (FRERP) on May 8, 1996 (61 FR 20944), which supersedes these documents.(Source NUREG-0654 Addenda Mar 2002)* a. specific persons by title authorized to request Federal assistance; see A.l.d., A.2.a.	C.1	
C.1.b	b. specific Federal resources expected, including expected times of arrival at specific nuclear facility sites; and	C.1.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
C.1.c	c. specific licensee, State and local resources available to support the Federal response, e.g., airfields, command posts, telephone lines, radio frequencies and telecommunications centers.	C.1.c	
C.2.a	Each principal offsite organization may dispatch representatives to the licensee's near-site Emergency Operations Facility. (State technical analysis representatives at the near site EOF are preferred.)	C.2	Offsite Responsibility
C.2.b	b. The licensee shall prepare for the dispatch of a representative to principal offsite governmental emergency operations centers.	C.2	
C.3	Each organization shall identify radiological laboratories and their general capabilities and expected availability to provide radiological monitoring and analyses services which can be used in an emergency.	C.3	
C.4	Each organization shall identify nuclear and other facilities, organizations or individuals which can be relied upon in an emergency to provide assistance. Such assistance shall be identified and supported by appropriate letters of agreement.	C.4	
D.1	An emergency classification and emergency action level scheme as set forth in Appendix 1must be established by the licensee.	D.1	
D.1 (continued)	The specific instruments, parameters or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures.	Annex 1, 2, & 3 Section 4	
D.1 (continued)	The plan shall identify the parameter values and equipment status for each emergency class.	Annex 1, 2, & 3 Section 4	
D.2	The initiating conditions shall include the example conditions found in Appendix I and all postulated accidents in the Final Safety Analysis Report (FSAR) for the nuclear facility.	Annex 1, 2, & 3 Section 4	
D.3	Each State and local organization shall establish an emergency classification and emergency action level scheme consistent with that established by the facility licensee.	D.3	Offsite Responsibility
D.4	Each State and local organization should have procedures in place that provide for emergency actions to be taken which are consistent with the emergency actions recommended by the nuclear facility licensee, taking into account local offsite conditions that exist at the time of the emergency.	D.4	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
E.1	Each organization shall establish procedures which describe mutually agreeable bases for notification of response organizations consistent with the emergency classification and action level scheme set forth in Appendix 1. These procedures shall include means for verification of messages. The specific details of verification need not be included in the plan.	E.1	
E.2	Each organization shall establish procedures for alerting, notifying, and mobilizing emergency response personnel.	E.2	
E.3	The licensee in conjunction with State and local organizations shall establish the contents of the initial emergency messages to be sent from the plant. These measures shall contain information about the class of emergency, whether a release is taking place, potentially affected population and areas, and whether protective measures may be necessary.	E.3	
E.4.a	Each licensee shall make provisions for follow up messages from the facility to offsite authorities which shall contain the following information if it is known and appropriate: a. location of incident and name and telephone number (or communications channel identification) of caller;	E.4	
E.4.b	b. date/time of incident;	E.4	
E.4.c	c. class of emergency;	E.4	
E.4.d	d. type of actual or projected release (airborne, waterborne, surface spill), and estimated duration/impact times;	E.4	
E.4.e	e. estimate of quantity of radioactive material released or being released and the points and height of releases;	E.4	
E.4.f	f. chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines and particulates;	E.4	
E.4.g	g. meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability, precipitation, if any);	E.4	
E.4.h	h. actual or projected dose rates at site boundary; projected integrated dose at site boundary;	E.4	
E.4.i	i. projected dose rates and integrated dose at the projected peak and at 2, 5 and 10 miles, including sector(s) affected;	E.4	
E.4.j	j. estimate of any surface radioactive contamination in plant, onsite or offsite;	E.4	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
E.4.k	k. licensee emergency response actions underway;	E.4	
E.4.l	l. recommended emergency actions, including protective measures;	E.4	
E.4.m	m. request for any needed onsite support by offsite organizations; and	E.4	
E.4.n	n. prognosis for worsening or termination of event based on plant information.	E.4	
E.5	State and local government organizations shall establish a system for disseminating to the public appropriate information contained in initial and follow up messages received from the licensee including the appropriate notification to appropriate broadcast media, e.g., the Emergency Broadcast System (EBS).* ** The Emergency Broadcast System (EBS) was replaced by the Emergency Alert System (EAS) by a Report and Order that the Federal Communications Commission issued on December 28, 1994 (59 FR 67090).(Source NUREG-0654 Addenda Mar 2002)*	E.5	Offsite Responsibility
E.6	Each organization shall establish administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone. (See Appendix 3.) It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. It shall be the responsibility of the State and local governments to activate such a system.	E.6	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
E.7	Each organization shall provide written messages intended for the public, consistent with the licensee's classification scheme. In particular, draft messages to the public giving instruction with regard to specific protective actions to be taken by occupants of affected areas shall be prepared and included as part of the State and local plans. Such messages should include the appropriate aspects of sheltering, ad hoc, respiratory protection, e.g., handkerchief over mouth, thyroid blocking or evacuation. The role of the licensee is to provide supporting information for the messages. For ad hoc respiratory protection see "Respiratory Protective Devices Manual" American Industrial Hygiene Association, 1963 pp. 123-126.* ** The current Respiratory Protective Devices Manual (2nd edition) and the forthcoming 3rd edition do not contain a similar table for ad hoc respiratory protection; however, according to the American Industrial Hygiene Association, it is still correct to refer to the 1963 manual as the most recent version of the Respiratory Protection Manual that contains the ad hoc respiratory protection table.(Source NUREG-0654 Addenda Mar 2002)*	E.7	
F.1	The communication Plans for emergencies shall include organizational titles and alternates for both ends of the communication links.	F.1	
F.1 (continued)	Each organization shall establish reliable primary and backup means of communication for licensees, local, and State response organizations. Such systems should be selected to be compatible with one another.	F.1	
F.1.a	Each plan shall include: a. provision for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions.	F.1	
F.1.b	b. provision for communications with contiguous State/local governments within the Emergency Planning Zones;	F.1	
F.1.c	c. provision for communications as needed with Federal emergency response organizations;	F.1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
F.1.d	d. provision for communications between the nuclear facility and the licensee's near-site Emergency Operations Facility, State and local emergency operations center, and radiological monitoring teams;	F.1	
F.1.e	e. provision for alerting or activating emergency personnel in each response organization; and	F.1	
F.1.f	f. provision for communication by the licensee with NRC headquarters and NRC Regional Office Emergency Operations Centers and the licensee's near-site Emergency Operations Facility and radiological monitoring team assembly area.	F.1	
F.2	Each organization shall ensure that a coordinated communication link for fixed and mobile medical support facilities exists.	F.2	
F.3	Each organization shall conduct periodic testing of the entire emergency communications system (see evaluation criteria H.10, N.2.a and Appendix 3).	F.3, N.2	
G.1	Each organization shall provide a coordinated periodic (at least annually) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency.	G.1	
G.1.a	This information shall include, but not necessarily be limited to: a. educational information on radiation;	G.1.a	
G.1.b	b. contact for additional information;	G.1.b	
G.1.c	c. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and	G.1.c	
G.1.d	d. special needs of the handicapped.	G.1.e	
G.1 (continued)	Means for accomplishing this dissemination may include, but are not necessarily limited to: information in the telephone book; periodic information in utility bills; posting in public areas; and publications distributed on an annual basis.	G.1	
G.2	The public information program shall provide the permanent and transient adult population within the plume exposure EPZ an adequate opportunity to become aware of the information annually. The programs should include provision for written material that is likely to be available in a residence during an emergency.	G.2	
G.2 (continued)	Updated information shall be disseminated at least annually.	G.1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
G.2 (continued)	Signs or other measures (e.g., decals, posted notices or other means, placed in hotels, motels, gasoline stations and phone booths) shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an emergency or accident occurs.	G.2	
G.2 (continued)	Such notices should refer the transient to the telephone directory or other source of local emergency information and guide the visitor to appropriate radio and television frequencies.	G.2	
G.3.a	a. Each principal organization shall designate the points of contact and physical locations for use by news media during an emergency.	G.3	
G.3.b	b. Each licensee shall provide space which may be used for a limited number of the news media at the near site Emergency Operations Facility.	G.3.b	
G.4.a	a. Each principal organization shall designate a spokesperson who should have access to all necessary information.	G.4.a	
G.4.b	b. Each organization shall establish arrangements for timely exchange of information among designated spokespersons.	G.4.b	
G.4.c	c. Each organization shall establish coordinated arrangements for dealing with rumors.	G.4.b	
G.5	Each organization shall conduct coordinated programs at least annually to acquaint news media with the emergency plans, information concerning radiation, and points of contact for release of public information in an emergency.	G.5	
H.1	Each licensee shall establish a Technical Support Center and an onsite Operational Support Center (assembly area) in accordance with NUREG-0696, Revision 1.* *"Revision 1" should be deleted; NUREG-0696 has not been revised. (Source NUREG-0654 Addenda Mar 2002)*	H.1.b	
H.2	Each licensee shall establish an Emergency Operations Facility from which evaluation and coordination of all licensee activities related to an emergency is to be carried out and from which the licensee shall provide information to Federal, State and local authorities responding to radiological emergencies in accordance with NUREG-0696, Revision 1.* *"Revision 1" should be deleted; NUREG-0696 has not been revised. (Source NUREG-0654 Addenda Mar 2002)*	H.2	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
H.3	Each organization shall establish an emergency operations center for use in directing and controlling response functions.	H.4	Offsite Responsibility
H.4	Each organization shall provide for timely activation and staffing of the facilities and centers described in the plan.	H.5	
H.5.a	Each licensee shall identify and establish onsite monitoring systems that are to be used to initiate emergency measures in accordance with Appendix 1, as well as those to be used for conducting assessment. The equipment shall include: a. geophysical phenomena monitors, (e.g., meteorological, hydrologic, seismic);	H.6.a	
H.5.b	b. radiological monitors, (e.g., process, area, emergency, effluent, wound and portable monitors and sampling equipment);	H.6.b	
H.5.c	c. process monitors, (e.g., reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, status or lineup of equipment components); and	H.6.c	
H.5.d	d. fire and combustion products detectors.	H.6.d	
H.6.a	Each licensee shall make provision to acquire data from or for emergency access to offsite monitoring and analysis equipment including: a. geophysical phenomena monitors, (e.g., meteorological, hydrologic, seismic);	H.6.a	
H.6.b	b. radiological monitors including radiometers and sampling devices.	H.6.b	
H.6.b (continued)	Dosimetry shall be provided and shall meet, as a minimum, the NRC Radiological Assessment Branch Technical position for the Environmental Radiological Monitoring Program; and	H.7.b	
H.6.c	c. laboratory facilities, fixed or mobile.	H.7.c	
H.7	Each organization, where appropriate, shall provide for offsite radiological monitoring equipment in the vicinity of the nuclear facility.	H.7	
H.8	Each licensee shall provide meteorological instrumentation and procedures which satisfy the criteria in Appendix 2,	H.9	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
H.8 (continued)	And provisions to obtain representative current meteorological information from other sources.	H.9	
H.9	Each licensee shall provide for an onsite Operational Support Center (assembly area) which shall have adequate capacity, and supplies, including, for example, respiratory protection,	H.10	
H.9 (continued)	protective clothing,	H.10	
H.9 (continued)	portable lighting,	H.10	
H.9 (continued)	portable radiation monitoring equipment,	H.10	
H.9 (continued)	cameras and	H.10	
H.9 (continued)	communications equipment for personnel present in the assembly area.	H.11	
H.10	Each organization shall make provisions to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use.	H.11	
H.10 (continued)	There shall be sufficient reserves of instruments/equipment to replace those which are removed from emergency kits for calibration or repair.	H.11	
H.10 (continued)	Calibration of equipment shall be at intervals recommended by the supplier of the equipment.	H.11	
H.11	Each plan shall, in an appendix, include identification of emergency kits by general category (protective equipment, communications equipment, radiological monitoring equipment and emergency supplies).	H.12	
H.12	Each organization shall establish a central point (preferably associated with the licensee's near-site Emergency Operations Facility), for the receipt and analysis of all field monitoring data and coordination of sample media.	H.14	
I.1	Each licensee shall identify plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents, and shall identify the plant parameter values or other information, which correspond to the example initiating conditions of Appendix 1.	I.1	
I.1 (continued)	Such parameter values and the corresponding emergency class shall be included in the appropriate facility emergency procedures.	I.1	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
I.1 (continued)	Facility emergency procedures shall specify the kinds of instruments being used and their capabilities.	I.1	
I.2	Onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident shall include: post-accident sampling capability,	I.2	
I.2 (continued)	radiation and effluent monitors,	I.2	
I.2 (continued)	in-plant iodine instrumentation, and	I.2	
I.2 (continued)	Containment radiation monitoring in accordance with NUREG-0578, as elaborated in the NRC letter to all power reactor licensees dated October 30, 1979.* ** NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, and Supplement 1 to NUREG-0737, January 1983, supersede these citations. (Source NUREG-0654 Addenda Mar 2002)*	I.2	
I.3.a	Each licensee shall establish methods and techniques to be used for determining: a. the source term of releases of radioactive material within plant systems. An example is the relationship between the containment radiation monitor(s) reading(s) and radioactive material available for release from containment.	I.3	
I.3.b	b. the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	I.3	
I.4	Each licensee shall establish the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions.	I.4	
I.5	Each licensee shall have the capability of acquiring and evaluating meteorological information sufficient to meet the criteria of Appendix 2.	I.5	
I.5 (continued)	There shall be provisions for access to meteorological information by at least the near site Emergency Operations Facility, the Technical Support Center, the Control Room and an offsite NRC center.	I.5	
I.5 (continued)	The licensee shall make available to the State suitable meteorological data processing interconnections which will permit independent analysis by the State, of facility generated data in those States with the resources to effectively use this information.	I.5	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
I.6	Each licensee shall establish the methodology for determining the release rate/projected doses if the instrumentation used for assessment are off scale or inoperable.	I.6	
I.7	Each organization shall describe the capability and resources for field monitoring within the plume exposure Emergency Planning Zone which are an intrinsic part of the concept of operations for the facility.	I.7	
I.8	Each organization, where appropriate, shall provide methods, equipment and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. This shall include activation,	I.8	
I.8 (continued)	notification means,	I.8	
I.8 (continued)	field team composition,	I.8	
I.8 (continued)	transportation,	I.8	
I.8 (continued)	communication,	I.8	
I.8 (continued)	monitoring equipment and	I.8	
I.8 (continued)	estimated deployment times.	I.8	
I.9	Each organization shall have a capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7} uCi/cc (microcuries per cubic centimeter) under field conditions. Interference from the presence of noble gas and background radiation shall not decrease the stated minimum detectable activity.	I.9	
I.10	Each organization shall establish means for relating the various measured parameters (e.g., contamination levels, water and air activity levels) to dose rates for key isotopes (i.e., those given in Table 3, page 18) and gross radioactivity measurements.	I.10	
I.10 (continued)	Provisions shall be made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the protective action guides. The detailed provisions shall be described in separate procedures.	I.10	
I.11	Arrangements to locate and track the airborne radioactive plume shall be made, using either or both Federal and State resources.	I.11	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.1.a	Each licensee shall establish the means and time required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including: a. Employees not having emergency assignments;	J.1 J.1	
J.1.b	b. Visitors;	J.1	
J.1.c	c. Contractor and construction personnel; and	J.1	
J.1.d	d. Other persons who may be in the public access areas on or passing through the site or within the owner controlled area.	J.1	
J.2	Each licensee shall make provisions for evacuation routes and transportation for onsite individuals to some suitable offsite location, including alternatives for inclement weather, high traffic density and specific radiological conditions.	J.2	
J.3	Each licensee shall provide for radiological monitoring of people evacuated from the site.	J.3	
J.4	Each licensee shall provide for the evacuation of onsite non-essential personnel in the event of a Site or General Emergency and	J.4	
J.4 (continued)	shall provide a decontamination capability at or near the monitoring point specified in J.3.	J.3	
J.5	Each licensee shall provide for a capability to account for all individuals onsite at the time of the emergency and ascertain the names of missing individuals within 30 minutes of the start of an emergency and account for all onsite individuals continuously thereafter.	J.5	
J.6.a	Each licensee shall, for individuals remaining or arriving onsite during the emergency, make provisions for: a. Individual respiratory protection;	J.6.a	
J.6.b	b. Use of protective clothing; and	J.6.b	
J.6.c	c. Use of radioprotective drugs, (e.g., individual thyroid protection).	J.6.c	
J.7	Each licensee shall establish a mechanism for recommending protective actions to the appropriate State and local authorities.	J.7	
J.7 (continued)	These shall include Emergency Action Levels corresponding to projected dose to the population-at-risk, in accordance with Appendix 1 and	J.7	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.7 (continued)	with the recommendations set forth in Tables 2.1 and 2.2 of the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-520/1-75-001).* ** EPA issued EPA-400-R-92-001, May 1992, which supersedes this document.(Source NUREG-0654 Addenda Mar 2002)*	J.7	
J.7 (continued)	As specified in Appendix 1, prompt notification shall be made directly to the offsite authorities responsible for implementing protective measures within the plume exposure pathway Emergency Planning Zone.	J.7	
J.8	Each licensee's plan shall contain time estimates for evacuation within the plume exposure EPZ. These shall be in accordance with Appendix 4.	J.8	
J.9	Each State and local organization shall establish a capability for implementing protective measures based upon protective action guides and other criteria.	J.9	Offsite Responsibility
J.9 (continued)	This shall be consistent with the recommendations of EPA regarding exposure resulting from passage of radioactive airborne plumes, (EPA-520/1-75-001) and with those of DHEW (DHHS)/FDA regarding radioactive contamination of human food and animal feeds as published in the Federal Register of December 15, 1978 (43 FR 58790).* * EPA issued EPA-400-R-92-001, May 1992, which supersedes EPA-5201 1-75-001. The Food and Drug Administration (FDA), Department of Health and Human Services (DHHS), issued "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds, Recommendations for State and Local Agencies, Availability," on August 13, 1998 (63 FR 43402).(Source NUREG-0654 Addenda Mar 2002)	J.9	Offsite Responsibility
J.10.a	The organization's plans to implement protective measures for the plume exposure pathway shall include: a. Maps showing evacuation routes,	J.10.a	
J.10.a (continued)	evacuation areas,	J.10.a	
J.10.a (continued)	preselected radiological sampling and monitoring points, (identification of radiological sampling and monitoring points shall include the designators in Table J-1 or an equivalent uniform system described in the plan);		
J.10.a (continued)	relocation centers in host areas,	J.10.a	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.10.a (continued)	and shelter areas.	J.10.a	
J.10.b	b. Maps showing population distribution around the nuclear facility. This shall be by evacuation areas (licensees shall also present the information in a sector format);	J.10,b	
J.10.c	c. Means for notifying all segments of the transient and resident population;	J.10.c	
J.10.d	d. Means for protecting those persons whose mobility may be impaired due to such factors as institutional or other confinement;	J.10.d	Offsite Responsibility
J.10.e	e. Provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ whose immediate evacuation may be infeasible or very difficult,	J.10.e	Offsite Responsibility
J.10.e (continued)	including quantities, storage, and means of distribution.	J.10.e	Offsite Responsibility
J.10.f	f. State and local organizations' plans should include the method by which decisions by the State Health Department for administering radioprotective drugs to the general population are made during an emergency	J.10.f	Offsite Responsibility
J.10.f (continued)	and the predetermined conditions under which such drugs may be used by offsite emergency workers;* ** The Food and Drug Administration (FDA) issued "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency," on December 11, 2001 (66 FR 238:64046), which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)*	J.10.f	Offsite Responsibility
J.10.g	g. Means of relocation;	J.10.g	Offsite Responsibility
J.10.h	h. Relocation centers in host areas which are at least 5 miles, and preferably 10 miles, beyond the boundaries of the plume exposure emergency planning zone; (See K.8)	J.10.h	Offsite Responsibility
J.10.i	i. Projected traffic capacities of evacuation routes under emergency conditions;	J.10.i	Offsite Responsibility
J.10.j	j. Control of access to evacuated areas and organization responsibilities for such control;	J.10.j	Offsite Responsibility
J.10.k	k. Identification of and means for dealing with potential impediments (e.g., seasonal impassability of roads) to use of evacuation routes, and contingency measures;	J.10.k	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.10.l	l. Time estimates for evacuation of various sectors and distances based on a dynamic analysis (time-motion study under various conditions) for the plume exposure pathway emergency planning zone (See Appendix 4); and	J.10.l	Offsite Responsibility
J.10.m	m. The bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions.	J.10.m	
J.10.m (continued)	This shall include expected local protection afforded * in residential units or other shelter for direct and inhalation exposure, as well as evacuation time estimates. **EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)*	J.10.m	
J.11	Each State shall specify the protective measures to be used for the ingestion pathway, including the methods for protecting the public from consumption of contaminated foodstuffs.	J.11	Offsite Responsibility
J.11 (continued)	This shall include criteria for deciding whether dairy animals should be put on stored feed.	J.11	Offsite Responsibility
J.11 (continued)	The plan shall identify procedures for detecting contamination,	J.11	Offsite Responsibility
J.11 (continued)	for estimating the dose commitment consequences of uncontrolled ingestion,	J.11	Offsite Responsibility
J.11 (continued)	and for imposing protection procedures such as impoundment, decontamination, processing, decay, product diversion, and preservation.	J.11	Offsite Responsibility
J.11 (continued)	Maps for recording survey and monitoring data, key land use data (e.g., farming), dairies, food processing plants, water sheds, water supply intake and treatment plants and reservoirs shall be maintained.	J.11	Offsite Responsibility
J.11 (continued)	Provisions for maps showing detailed crop information may be by including reference to their availability and location and a plan for their use.	J.11	Offsite Responsibility
J.11 (continued)	The maps shall start at the facility and include all of the 50-mile ingestion pathway EPZ.	J.11	Offsite Responsibility
J.11 (continued)	Up-to-date lists of the name and location of all facilities which regularly process milk products and other large amounts of food or agricultural products originating in the ingestion pathway Emergency Planning Zone, but located elsewhere, shall be maintained.	J.11	Offsite Responsibility
J.12	Each organization shall describe the means for registering and monitoring of evacuees at relocation centers in host areas.	J.12	Offsite Responsibility

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
J.12 (continued)	The personnel and equipment available should be capable of monitoring within about a 12 hour period all residents and transients in the plume exposure EPZ arriving at relocation centers.	J.12	Offsite Responsibility
K.1.a	Each licensee shall establish onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA-520/1-75/001) for:* ** EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.(Source NUREG-0654 Addenda Mar 2002)* a. removal of injured persons;	K.1 K.1	
K.1.b	b. undertaking corrective actions;	K.1	
K.1.c	c. performing assessment actions;	K.1	
K.1.d	d. providing first aid;	K.1	
K.1.e	e. performing personnel decontamination;	K.1	
K.1.f	f. providing ambulance service; and	K.1	
K.1.g	g. providing medical treatment services.	K.1	
K.2	Each licensee shall provide an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. The plan shall identify individual(s), by position or title, who can authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits.	K.2	
K.2 (continued)	Procedures shall be worked out in advance for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures shall include expeditious decision making and a reasonable consideration of relative risks.	K.2	
K.3.a	a. Each organization shall make provision for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any nuclear accident, including volunteers.	K.3	
K.3.a (continued)	Each organization shall make provisions for distribution of dosimeters, both self-reading and permanent record devices.	K.3	
K.3.b	Each organization shall ensure that dosimeters are read at appropriate frequencies and	K.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
K.3.b (continued)	provide for maintaining dose records for emergency workers involved in any nuclear accident.	K.3	
K.4	Each State and local organization shall establish the decision chain for authorizing emergency workers to incur exposures in excess of the EPA General Public Protective Action Guides (i.e., EPA PAGs for emergency workers and lifesaving activities).	K.4	Offsite Responsibility
K.5.a	a. Each organization as appropriate, shall specify action levels for determining the need for decontamination.	K.5	
K.5.b	b. Each organization, as appropriate, shall establish the means for radiological decontamination of emergency personnel wounds, supplies, instruments and equipment, and for waste disposal.	K.5	
K.6.a	Each licensee shall provide onsite contamination control measures including: a. area access control;	K.6.a	
K.6.b	b. drinking water and food supplies;	K.6.b	
K.6.c	c. criteria for permitting return of areas and items to normal use, see Draft ANSI 13.12.* **EPA PAG Manual, EPA 400-R-92-001 (see items 16 and 17), and the Food and Drug Administration, DHHS, "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies," dated August 13, 1998 (63 FR 43402) supersede this citation.(Source NUREG-0654 Addenda Mar 2002)*	K.6.c	
K.7	Each licensee shall provide the capability for decontaminating relocated onsite personnel,	K.7	
K.7 (continued)	including provisions for extra clothing and decontaminants suitable for the type of contamination expected, with particular attention given to radioiodine contamination of the skin.	K.7	
L.1	Each organization shall arrange for local and backup hospital and medical services having the capability for evaluation of radiation exposure and uptake,	L.1	
L.1 (continued)	Including assurance that persons providing these services are adequately prepared to handle contaminated individuals.	L.1	
L.2	Each licensee shall provide for onsite first aid capability.	L.2	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
L.3	Each State shall develop lists indicating the location of public, private and military hospitals and other emergency medical services facilities within the State or contiguous States considered capable of providing medical support for any contaminated injured individual.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued)	The listing shall include the name, location, type of facility and capacity and any special radiological capabilities.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued)	These emergency medical services should be able to radiologically monitor personnel contamination, and	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.3 (continued	have facilities and trained personnel able to care for contaminated injured persons.	Not addressed in the VCSNS Emergency Plan.	Offsite Responsibility
L.4	Each organization shall arrange for transporting victims of radiological accidents to medical support facilities.	L.3	
M.1	Each organization, as appropriate, shall develop general plans and procedures for reentry and recovery and describe the means by which decisions to relax protective measures (e.g., allow reentry into an evacuated area) are reached.	M.1	
M.1 (continued)	This process should consider both existing and potential conditions.	M.1	
M.2	Each licensee plan shall contain the position/title, authority and responsibilities of individuals who will fill key positions in the facility recovery organization.	M.2.a	
M.2 (continued)	This organization shall include technical personnel with responsibilities to develop, evaluate and direct recovery and reentry operations. The recovery organization recommended by the Atomic Industrial Forum's "Nuclear Power Plant Emergency Response Plan" dated October 11, 1979, is an acceptable framework.* **"Functional Criteria for Emergency Response Facilities," NUREG-0696, issued on February 1981, and "Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability," NUREG-0737, Supplement No. 1, issued January 1983, supersede this citation.(Source NUREG-0654 Addenda Mar 2002)*	M.2	
M.3	Each licensee and State plan shall specify means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur.	M.3	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
M.4	Each plan shall establish a method for periodically estimating total population exposure.	M.4	
N.1.a	a. An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations. The emergency preparedness exercise shall simulate an emergency that results in offsite radiological releases which would require response by offsite authorities. Exercises shall be conducted as set forth in NRC and FEMA rules.	N.1.a	
N.1.b	b. An exercise shall include mobilization of State and local personnel and resources adequate to verify the capability to respond to an accident scenario requiring response.	N.1.a	
N.1.b (continued)	The organization shall provide for a critique of the annual exercise by Federal and State observers/evaluators.	N.4	
N.1.b (continued)	The scenario should be varied from year to year such that all major elements of the plans and preparedness organizations are tested within a five-year period.	N.1	
N.1.b (continued)	Each organization should make provisions to start an exercise between 6:00 p.m. and midnight, and	N.1	
N.1.b (continued)	another between midnight and 6:00 a.m. once every six years.	N.1	
N.1.b (continued)	Exercises should be conducted under various weather conditions.	N.1	
N.1.b (continued)	Some exercises should be unannounced.	N.1	
N.2.a	A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each organization shall conduct drills, in addition to the annual exercise at the frequencies indicated below: a. Communication Drills Communications with State and local governments within the plume exposure pathway Emergency Planning Zone shall be tested monthly.	N.2.b	
N.2.a (continued)	Communications with Federal emergency response organizations and States within the ingestion pathway shall be tested quarterly.	N.2.b	
N.2.a (continued)	Communications between the nuclear facility, State and local emergency operations centers, and field assessment teams shall be tested annually.	N.2.b	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
N.2.a (continued)	Communication drills shall also include the aspect of understanding the content of messages.	N.2.b	
N.2.b	b. Fire Drills Fire drills shall be conducted in accordance with the plant (nuclear facility) technical specifications.	N.2.b	
N.2.c	c. Medical Emergency Drills A medical emergency drill involving a simulated contaminated individual which contains provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility) shall be conducted annually. The offsite portions of the medical drill may be performed as part of the required annual exercise.	N.2.d	
N.2.d	d. Radiological Monitoring Drills Plant environs and radiological monitoring drills (onsite and offsite) shall be conducted annually.	N.2.e	
N.2.d (continued)	These drills shall include collection and analysis of all sample media (e.g., water, vegetation, soil and air), and provisions for communications and record keeping. The State drills need not be at each site. Where appropriate, local organizations shall participate.	N.2.e	
N.2.e.1	e. Health Physics Drills (I) Health Physics drills shall be conducted semi-annually which involve response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment. The State drills need not be at each site.	N.2.f	
N.2.e.2	(2) Analysis of in plant liquid samples with actual elevated radiation levels including use of the post-accident sampling system shall be included in Health Physics drills by licensees annually.	N.2.e	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
N.3.a	Each organization shall describe how exercises and drills are to be carried out to allow free play for decision making and to meet the following objectives. Pending the development of exercise scenarios and exercise evaluation guidance by NRC and FEMA the scenarios for use in exercises and drills shall include but not be limited to, the following: a. The basic objective(s) of each drill and exercise and appropriate evaluation criteria;	N.3.a	
N.3.b	b. The date(s), time period, place(s) and participating organizations;	N.3.b	
N.3.c	c. The simulated events;	N.3.c	
N.3.d	d. A time schedule of real and simulated initiating events;	N.3.e	
N.3.e	e. A narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities; and	N.3.f	
N.3.f	f. A description of the arrangements for and advance materials to be provided to official observers.	N.3.h	
N.4	Official observers from Federal, State or local governments will observe, evaluate, and critique the required exercises. A critique shall be scheduled at the conclusion of the exercise to evaluate the ability of organizations to respond as called for in the plan. The critique shall be conducted as soon as practicable after the exercise, and	N.4	
N.4 (continued)	a formal evaluation should result from the critique.	N.4	
N.5	Each organization shall establish means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and	N.5	
N.5 (continued)	for assigning responsibility for implementing corrective actions.	N.5	
N.5 (continued)	Each organization shall establish management control used to ensure that corrective actions are implemented.	N.5	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
O.1.a	Each organization shall assure the training of appropriate individuals. a. Each facility to which the plant applies shall provide site specific emergency response training for those offsite emergency organizations who may be called upon to provide assistance in the event of an emergency,	O.1.a	
O.1.b	b. Each offsite response organization shall participate in and receive training. Where mutual aid agreements exist between local agencies such as fire, police and ambulance/rescue, the training shall also be offered to the other departments who are members of the mutual aid district.	O.1.b	Offsite Responsibility
O.2	The training program for members of the onsite emergency organization shall, besides classroom training, include practical drills in which each individual demonstrates ability to perform his assigned emergency function.	O.2	
O.2 (continued)	During the practical drills, on-the-spot correction of erroneous performance shall be made and a demonstration of the proper performance offered by the instructor.	O.2	
O.3	Training for individuals assigned to licensee first aid teams shall include courses equivalent to Red Cross Multi-Media.	O.3	
O.4.a	Each organization shall establish a training program for instructing and qualifying personnel who will implement radiological emergency response plans.2/ The specialized initial training and periodic retraining programs (including the scope, nature and frequency) shall be provided in the following categories: a. Directors or coordinators of the response organizations;	O.4.a	
O.4.b	b. Personnel responsible for accident assessment;	O.4.b	
O.4.c	c. Radiological monitoring teams and radiological analysis personnel;	O.4.c	
O.4.d	d. Police, security and fire fighting personnel;	O.4.d	
O.4.e	e. Repair and damage control/correctional action teams (onsite);	O.4.e	
O.4.f	f. First aid and rescue personnel;	O.4.f	
O.4.g	g. Local support services personnel including Civil Defense/Emergency Service personnel;	O.4.g	
O.4.h	h. Medical support personnel;	O.4.h	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
O.4.i	i. Licensee's headquarters support personnel;	O.4.i	
O.4.j	j. Personnel responsible for transmission of emergency information and instructions.	O.4.j	
O.5	Each organization shall provide for the initial and annual retraining of personnel with emergency response responsibilities.	O.5	
P.1	Each organization shall provide for the training of individuals responsible for the planning effort.	P.1	
P.2	Each organization shall identify by title the individual with the overall authority and responsibility for radiological emergency response planning.	P.2	
P.3	Each organization shall designate an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations.	P.3	
P.4	Each organization shall update its plan and agreements as needed, review and certify it to be current on an annual basis.	P.4	
P.4 (continued)	The update shall take into account changes identified by drills and exercises.	P.4	
P.5	The emergency response plans and approved changes to the plans shall be forwarded to all organizations and appropriate individuals with responsibility for implementation of the plans.	P.5	
P.5 (continued)	Revised pages shall be dated and marked to show where changes have been made.	P.5	
P.6	Each plan shall contain a detailed listing of supporting plans and their source.	P.6	
P.7	Each plan shall contain as an appendix listing, by title, procedures required to implement the plan.	P.7	
P.7 (continued)	The listing shall include the section(s) of the plan to be implemented by each procedure.	P.7	
P.8	Each plan shall contain a specific table of contents.	Table of Contents	
P.8 (continued)	Plans submitted for review should be cross-referenced to these criteria.	P.8	

PLANNING ELEMENT	STATEMENT	EPLAN	COMMENTS
P.9	Each licensee shall arrange for and conduct independent reviews of the emergency preparedness program at least every 12 months. (An independent review is one conducted by any competent organization either internal or external to the licensees' organization, but who are not immediately responsible for the emergency preparedness program).	P.9	
P.9 (continued)	The review shall include the emergency plan, its implementing procedures and practices, training, readiness testing, equipment, and interfaces with State and local governments.	P.9	
P.9 (continued)	Management controls shall be implemented for evaluation and correction of review findings.	P.9	
P.9 (continued)	The result of the review, along with recommendations for improvements, shall be documented, reported to appropriate licensee corporate and plant management, and involved Federal, State and local organizations,	P.9	
P.9 (continued)	and retained for a period of five years.	P.9	
P.10	Each organization shall provide for updating telephone numbers in emergency procedures at least quarterly.	P.10	

Appendix 7 – On-shift Staffing Analysis

The Unit 1 On-shift Staffing Analysis was prepared by Operations Support Services, Inc. This controlled document, in its entirety, is filed under separate cover and has been distributed to designated locations.

VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1

ATTACHMENT VII

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by SCE&G, Virgil C. Summer Nuclear Station in this document and References. Please direct questions regarding these commitments to Mr. Bruce L. Thompson, Manager, Nuclear Licensing, (803) 931-5042.

COMMITMENT	Due Date/Event
V. C. Summer Unit 1 will maintain its current Radiation Emergency Plan, EP-100 Revision 63, 30 (40) minute response positions and staffing until V. C. Summer Unit 2 implements its full on-shift staffing in accordance with COL Part 13, Units 2 & 3 Radiation Emergency Plan, Revision 5 Annex 2 Table 2-1, V. C. Summer On-shift Staffing and ERO Positions.	Prior to fuel load at V.C Summer Unit 2