



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-17-001

September 29, 2017

10 CFR 50.90

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

Sequoyah Nuclear Plant, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-77 and DPR-79  
NRC Docket Nos. 50-327 and 50-328

Subject: **Sequoyah Nuclear Plant, Units 1 and 2, License Amendment Request to Revise Emergency Plan Staff Augmentation Times**

In accordance with the provisions of 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," Tennessee Valley Authority (TVA) is submitting a request for an amendment to the Renewed Facility Operating License Nos. DPR-77 and DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2, respectively. TVA is proposing changes to the SQN Emergency Plan to extend staff augmentation times for Emergency Response Organization (ERO) functions.

The Enclosure provides a description of the proposed changes, a technical evaluation of the proposed changes, a regulatory evaluation, and a discussion of environmental considerations. Attachment 1 to the Enclosure provides a markup version of the SQN Emergency Plan showing the proposed changes to the affected pages. Attachment 2 to the Enclosure provides the retyped SQN Emergency Plan, incorporating the proposed changes to the affected pages. Attachment 3 to the Enclosure provides a comparison between NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, the 1988 NRC approved SQN Emergency Plan (Revision 0), the current SQN Emergency Plan, and the proposed changes to the SQN Emergency Plan. Attachment 4 to the Enclosure provides a Letter of Concurrence from the Tennessee Emergency Management Agency. Attachment 5 to the Enclosure provides a proposed revision to a license condition applicable to SQN, Unit 1, related to the requested Emergency Plan changes.

TVA has determined that there are no significant hazards considerations associated with the proposed changes and that the changes qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

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The SQN Plant Operations Review Committee and Nuclear Safety Review Board have reviewed the proposed changes and determined that operation of SQN in accordance with the proposed changes will not endanger the health and safety of the public.

Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Tennessee Department of Environment and Conservation.

TVA requests approval of this proposed license amendment by September 29, 2018 with implementation within 180 days of approval.

There are no new regulatory commitments contained in this letter. If you have any questions, please contact Ed Schrull at 423-751-3850.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th day of September 2017.

Respectfully,



J. W. Shea  
Vice President, Nuclear Regulatory Affairs and Support Services

Enclosure: Evaluation of Proposed Changes

cc (Enclosure):

NRC Regional Administrator - Region II  
NRC Senior Resident Inspector - Sequoyah Nuclear Plant  
NRC SQN Project Manager  
Director, Division of Radiological Health - Tennessee State Department of  
Environment and Conservation

**ENCLOSURE 1**  
**SEQUOYAH NUCLEAR PLANT**  
**UNIT 1 and UNIT 2**  
**Evaluation of Proposed Changes**

License Amendment Request to Revise Emergency Plan Staff Augmentation Times

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- 1. Proposed Emergency Plan Sections (Mark-up)
- 2. Proposed Emergency Plan Sections (Retyped)
- 3. NUREG-0654 Table B-1 Comparative Chart
- 4. Off-site Response Organization Concurrence Letter
- 5. Proposed Revision to Sequoyah Nuclear Plant, Unit 1, License Condition 2.C.(22)G.(a)

## 1.0 SUMMARY DESCRIPTION

The Tennessee Valley Authority (TVA) proposes revisions to the Sequoyah Nuclear Plant (SQN), Units 1 and 2, Emergency Plan. TVA completed a staffing analysis of on-shift responsibilities resulting from the effects associated with the proposed changes. Additionally, a functional analysis of the augmented Emergency Response Organization (ERO) positions based on extended response times and completion of Major Tasks as outlined in NUREG-0654/FEMA-REP-1, Revision 1, was completed. The analyses supported this request to make the following changes to the ERO while maintaining the site's ability to protect public health and safety:

- Eliminate 30-minute augmented response positions
- Extend the requirement for dispatch of sampling teams and augmentation of ERO positions to 60 and 90 minutes as applicable
- Reduce the number of Radiation Protection (RP) immediate response positions from 12 to 6
- Transition on-shift dose assessment from RP to Chemistry
- Remove maintenance personnel from on-shift
- Remove 'as needed' support positions of Site Vice President, Emergency Preparedness (EP) Manager, Technical Assessment Team Operations Coordinator, Other Engineers, Industrial Safety Advisor, Technical Support Center (TSC) and Operational Support Center (OSC) Clerks and OSC Nuclear Security Advisor from Appendix B Emergency Plan Figures.

Revised figures are included in the proposed SQN Emergency Plan that delineate positions associated with facility activation. This change allows for the transfer of command and control functions from the control room in advance of 60 minutes when Minimum Activation Staffing Positions (MASP) are met as currently defined in the Emergency Plan and clarifies facility organizational alignment.

The changes in staff augmentation response times, reduction in the number of immediate RP responders, removal of maintenance personnel from on-shift, and elimination of support positions not required for Emergency Plan implementation are considered a reduction in Emergency Plan effectiveness as defined in 10 CFR 50.54(q)(1)(iv). In accordance with 10 CFR 50.54(q)(4), changes to a licensee's emergency plan that reduce the effectiveness of the plan may not be implemented without prior Nuclear Regulatory Commission (NRC) approval and are submitted as a license amendment request (LAR) in accordance with 10 CFR 50.90.

## 2.0 DETAILED DESCRIPTION

### 2.1 Proposed Changes

Brief descriptions of the associated Emergency Plan proposed changes are provided below. The justification for each change is discussed in Section 3.2. The specific wording changes are provided in Attachments 1 and 2 to this enclosure as marked-up and retyped copies of the Emergency Plan pages, respectively.

- a. Radiological Emergency Plan (REP) Generic, Section 3.2.2, "Site Vice President," added notation that the position applies to Watts Bar and Browns Ferry only in accordance with the proposed change.
- b. REP Generic, Section 4.1.3, "Alert," added statement to include the dispatch of monitoring teams at this classification level for SQN only in accordance with the proposed change.
- c. REP Generic Section 5.2.2, "Alert," revised wording to reflect dispatch of monitoring teams at this classification level in accordance with the proposed change.
- d. REP Generic, Section 9.2.2.A, "Sampling Team," revised section to reflect dispatch of sampling team vehicles at an Alert or higher classification for SQN.
- e. REP Generic, Section 9.2.2.B, "Sampling Team," revised wording to apply more generically to differences in deployments times between the sites.
- f. REP Generic, Section 9.2.2.E, "Sampling Team," revised dispatch from 30 minutes at a Site Area Emergency or higher declaration to 60 minutes from an Alert or higher declaration for the first team and 90 minutes for the second team in accordance with the proposed changes for SQN.
- g. REP Generic, Section 9.2.2.G, "Sampling Team," revised to include changes associated with Section 9.2.2.B.
- h. Appendix B, Section B.5, "Site Emergency Organization," added statement that Figure B-1 identifies minimum staff positions required to activate the TSC and OSC and that facilities will be activated within 60 minutes of an Alert or higher classification.
- i. Appendix B, Section B.5, "Site Emergency Organization," revised wording to reflect changes in Figure B-1 and added a diagram outlining the transfer of command and control functions.
- j. Appendix B, Section B.5.1.1, "Site Vice President," section deleted in accordance with the proposed change. Additional sections under B.5.1 were renumbered accordingly.

- k. Appendix B, Section B.5.1.2, "Site Emergency Director," replaced 'staffed' and 'operational' with 'activated' to reflect standard application for this term and removed reference to 'Site Vice President' in accordance with the proposed change.
- l. Appendix B, Section B.5.1.3, "Operations Manager," added responsibility for performance of Federal Notification function and removed responsibilities associated with informing the Site Emergency Director of plant status and operational problems and assuring the control room is aware of accident assessment and response in accordance with the proposed change.
- m. Appendix B, Section B.5.1, added new subsection 3, "Operations Communicator," and included responsibilities previously assigned to the Operations Manager as well as responsibility for provision of support for the Federal Notifications function in accordance with the proposed change.
- n. Appendix B, Section B.5.1.6, "TSC Clerks," deleted section in accordance with the proposed change. Additional sections under B.5.1 were renumbered accordingly.
- o. Appendix B, Section 5.1.12, "Emergency Preparedness Manager," deleted section in accordance with proposed change. Additional sections under B.5.12 were renumbered accordingly.
- p. Appendix B, Figure B-1, "Site Emergency Organization," replaced figure with revised version in accordance with proposed change.
- q. Appendix B, Figure B-1, "TSC and OSC Emergency Organization," revised figure to reflect TSC and OSC augmented positions, minimum staff required for activation of each facility, and removal of 'as needed' positions.
- r. Appendix B, Figure B-2, "Minimum On-shift Response Personnel," figure replaced with revised version in accordance with proposed change.
- s. Appendix B, Figure B-2, "Minimum On-Shift Response Personnel," revised figure to more closely reflect on-shift and augmented positions in format similar to NUREG-0654 Table B-1.
- t. Appendix B, Figure B-3, "Technical Support Center," revised to reflect removal of support positions not required for implementation of the Emergency Plan and added 'Sample' to title to identify acceptability of other facility configurations as needed.
- u. Appendix B, Figure B-4, "Operations Support Center," revised to add the word 'Sample' to title to identify acceptability of other facility configurations as needed.

A change is also proposed to SQN, Unit 1, License Condition 2.C.(22)G.(a) to remove the reference to NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Preparedness in Support of Nuclear Power Plants," January 1980. The proposed revision is provided in Attachment 5.

## 2.2 Reason for the Proposed Changes

The proposed change to extend augmented response timeframes, eliminate certain non-essential positions, and reduce the number of immediate RP responders is needed to address limitations on the number of personnel available to respond to the site in 30 and 60 minutes. Some personnel live far enough away from the plant that they may be precluded from being assigned as immediate responders in the augmented ERO. Extending augmentation times increases the population of eligible personnel available to fill response positions and adds valuable expertise. The proposed change will not be applied as permission to delay response to an event.

The current SQN Emergency Plan requires response by 6 RP individuals at 30 minutes and an additional 6 at 60 minutes. The number of RP augmented responders is in alignment with NUREG-0654, Rev.1, Table B-1 values. The proposed changes reduce the number of required RP augmented positions and extend the response times for these positions in order to allow for increased flexibility in long term staffing for RP activities. The proposed changes also provide access to a larger pool of RP staff members that would be available for event response. Augmentation of 3 RP Technicians at 60 minutes and an additional 3 RP Technicians at 90 minutes is supported by improvement in the use of technology used for in-plant monitoring capability and access control/dosimetry as discussed in Section 3.0 of this Enclosure. One of the tasks assigned to augmented RP positions is the performance of environmental monitoring. The current Plan requires the dispatch of one survey team at 30 minutes and a second team at 60 minutes following the declaration of a Site Area Emergency or higher classification. The proposed change would extend the response time for the dispatch of the first survey team to 60 minutes and the second team to 90 minutes of an Alert or higher classification rather than the current Site Area Emergency or General Emergency classifications. The proposed change uses support personnel as survey team drivers, thus reducing the number of RP Technicians needed to perform the environmental monitoring function, which allows better allocation of resources.

The on-shift dose assessment function is transitioned from RP personnel to the on-shift Chemistry Technician. In the On-Shift Staffing Analysis (OSA), TVA determined that chemistry sampling activities were not required for the first 90 minutes after the event. Performance of dose assessment by the chemistry technician during this time allows the on-shift RP personnel to focus on survey and access control functions.

In the OSA, for the analyzed events, there were no actions requiring response by maintenance personnel for the first 90 minutes after event classification. Initial event response actions associated with troubleshooting are normally completed by on-shift operations personnel. The diverse and redundant nature of the Emergency Core Cooling System (ECCS) obviates the need for

maintenance activities as part of the initial response to an event. As a result, the proposed change removes maintenance positions from on-shift and makes these positions available for augmentation at 60 and 90 minutes to address equipment repair activities. Details associated with ECCS are addressed in Section 3.2.5 of this Enclosure. The proposed change maintains the requirement for augmentation of an Electrical and Mechanical Maintenance craft position at 60 minutes, and extends augmentation of an Instrumentation and Controls (I&C) Maintenance craft position to 90 minutes.

The current SQN Emergency Plan identifies 30 and 60-minute response positions in the TSC and OSC. The proposed change eliminates 30-minute response requirements, maintains 60-minute response for minimum staff positions, and extends the response times for remaining staff to 90 minutes. This change allows for transfer of command and control functions from the control room to augmented response facilities within the current 60-minute timeframe while allowing for extended response times for ERO personnel not performing activities directly related to relief of control room staff.

The TSC positions of “Technical Assessment Team Operations Advisor,” “Other Engineer,” and “TSC Clerks,” and the OSC positions of “Industrial Safety Advisor” and “Nuclear Security Advisor” are noted as being “as needed” positions in the current SQN Emergency Plan. These positions were included to identify additional resources available to the TSC and OSC should they be required. Additionally, the “Vice President” and “Emergency Preparedness Manager” positions in the TSC would be called in to fill support and oversight roles in response to a site event should the need arise. In an effort to streamline the TSC and OSC ERO, these seven positions are removed from Figure B-1 so that the diagram better reflects the positions required for specific activities associated with implementation of the Emergency Plan. Tasks performed by these positions can be performed as needed by TSC Engineering staff, OSC Department Briefers, Security personnel on-shift and the Site Emergency Director (SED), respectively, and will not detract from implementation of Emergency Plan required activities. The site will maintain the capability of providing additional support on an as-needed basis in each of these areas.

Maintaining an appropriate number of on-shift Operations personnel, crediting technological advances available for on-shift responders, requiring initial dispatch of a sampling team within 60 minutes of an Alert or higher classification, reducing the number of immediate RP responders and extending the augmentation response times for RP and I&C Maintenance Craft from 30 and 60 minutes to 60 and 90 minutes respectively, are practical and prudent alternate methods of ensuring effective and timely emergency response.

Details associated with the revised on-shift ERO, augmented ERO and key responsibilities and tasks as identified in NUREG-0654, Revision 1, are included in Section 3.2 of this enclosure.

The change to SQN, Unit 1, License Condition 2.C.(22)G.(a) is necessary because the proposed changes requested in this LAR include specific differences to NUREG-0654 staffing augmentation times. As discussed within this Enclosure, the SQN Emergency Plan continues to comply with applicable regulatory requirements.

### 2.3 SQN Emergency Plan Background

The Office of Nuclear Power Radiological Emergency Plan (ONP-REP) and Appendix B, Sequoyah Nuclear Plant, hereafter referred to as the SQN Emergency Plan, Revision 0, was reviewed and approved by the NRC in the area of staffing as documented by NRC Safety Evaluation Report (SER) dated November 1, 1988 (Reference 1) and implemented in Revision 0 of Appendix B, Figure B-1 "Site Emergency Organization," and Figure B-2, "Minimum On-Shift Emergency Personnel," of the SQN Emergency Plan. These figures provided the site commitment to meet the guidance for on-shift staffing and augmentation goals including 30-minute and 60-minute responders established in Table B-1 of NUREG-0654, Revision 1. Subsequently, a change to the Reactor Engineer augmentation time from 30 to 60 minutes was approved as noted in the NRC letter dated January 4, 1995 (Reference 2).

SQN has four Emergency Response Facilities (ERFs) augmenting the on-shift staff: the TSC, the OSC, the Central Emergency Control Center (CECC), and the Joint Information Center (JIC). During an emergency, the Shift Manager initially assumes the responsibility as the SED. Emergency response by on-shift staff is directed by the SED from the control room (CR) until relieved by an augmenting staff with the subsequent activation of ERFs.

SQN uses four standard levels of emergency classification as described in NUREG-0654, Revision 1. Augmentation of the on-shift staff for an Unusual Event is optional and is left to the discretion of the SED. At the Alert or higher emergency classification levels, all of the ERFs are activated.

## 3.0 TECHNICAL EVALUATION

### 3.1 Technical Analysis

This section discusses technological changes in plant systems, dose assessment, procedures, and training that have been completed to better support on-shift functions and ease operator burden. An on-shift analysis utilizing NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," methodology determined that the proposed changes did not result in conflicting duties for on-shift personnel.

### 3.1.1 Plant Computer System

When SQN Emergency Plan Revision 0 was originally approved, the site utilized a combination of the Westinghouse P250 plant computer and a Technical Support Center Data System (TSCDS) that implemented NUREG-0696 and NUREG-0737 requirements. The design criteria for the TSCDS were based on the requirements of NUREG-0737, Supplement 1, regarding the need for a Safety Parameter Display System (SPDS) and the upgrading of the ERFs. The requirements specified for the SPDS were met or exceeded by a system of displays provided by the TSCDS and the increased frequency of parameter updates. The operator interface consisted of a small number of printers located in the control room and computer room.

The parameters on the SPDS displays were provided by the TSCDS multiplexers and software. The system upgrade included introduction of automatic updates to plant overview and system displays on the computer monitors, consolidated safety parameter displays, and increased frequency of parameter updates.

In 1998, both the P250 and TSCDS were replaced with an SAIC Integrated Computer System (ICS). The number of plant operating parameters available on this system is larger due to the ability to communicate with other plant data acquisition systems.

Benefits of the upgraded system include:

- Programming capability for automated response such as indication of critical parameter alarms
- Improved plant monitoring capability for Emergency Director functions
- Fewer keystrokes required to switch between graphical displays
- Real time plant data available through graphical displays
- Real time read-only plant data available on any desktop computer through the corporate network

Power for ICS basic functions are provided by the TSC inverter, which is powered from the station battery system.

### 3.1.2 Dose Assessment

Specifically designed displays have been developed for obtaining the necessary information for performing dose assessment. These displays are available through the ICS and include specific information related to area radiation monitor readings, process radiation monitor readings, effluent release paths, and meteorological data.

### 3.1.2.1 Previous on-shift dose assessment

In 1988, dose assessment was performed using a manual method in accordance with site procedure. This method was used to estimate radioactive release rates. Inputs were obtained from control room instrumentation and plant computer data points, and calculations were computed by the performer.

### 3.1.2.2 Current on-shift dose assessment

Improvements have been made to the dose assessment program resulting in minimal user interface. Radiological dose assessment has benefited from technological advances that make it simpler and less time consuming. Current dose assessment capability includes the ability to perform dose assessment within the ICS using real-time data inputs. This method requires almost no user input and is available to control room personnel. Dose assessment performed using the ICS interface is accomplished by activating a single button resulting in rapid availability of dose projection results. Another method is also available to perform dose assessment using a spreadsheet. The spreadsheet method requires user input but automatically performs the required calculations. A manual method for performing dose assessment is provided should the other two methods become unavailable.

### 3.1.3 Automated Call-Out Systems

When SQN Emergency Plan Revision 0 was originally approved, the site utilized a Radio Paging system. The backup method was a call-out system that is still in use, with a directory of the ERO phone numbers to call, in the event the paging system failed.

In 2012, TVA implemented the Tennessee Valley Authority Enterprise Emergency Notification System (TEENS). The system is hosted by MIR3 and is described as follows:

“The system is a web-based notification service, offering immediate and simultaneous one-to-many communications using wired and wireless communication devices (telephones, Short Message Service (SMS) devices, email, pagers, and faxes). It provides automated and remote problem-solving capabilities to improve communication in large organizations—both internally and externally. It enables the recipient to send an immediate reply to resolve the issue and/or convey a new status condition to the appropriate people and systems. The service provides recipient response functionality to close the communication loop between Initiator (sender) and Recipient (receiver). The system sends time-sensitive notifications through a number of devices, including cell

and land line telephones, one- or two-way SMS devices, email, one- or two-way pagers, and faxes. Messages may be sent to all communication devices at the same time, or in any defined order.

- Automatically delivers messages to telephony, SMS, email, pager, and fax devices.
- Tracks delivery of Notifications in real time.
- Allows Recipients to select any number of predefined response choices.
- Securely stores and manages user contact data.
- Provides for grouping of users to better organize contacting Recipients.
- Provides for grouping of Notifications allowing delivery of different messages to different groups of Recipients and Devices.”

TEENS allows for faster response and the use of multiple devices to be contacted simultaneously. The EP Radio Paging System also remains available for use.

#### 3.1.4 Procedure Improvements

##### 3.1.4.1 Emergency Operating Procedures and Abnormal Operating Procedures

Since the original emergency plan approval, Emergency Operating Procedures (EOPs), derived from Westinghouse Owner’s Group (WOG) Emergency Response Guidelines, and Abnormal Operating Procedures (AOPs) have been improved through industry initiatives and plant-specific enhancements. EOPs use a symptom-based approach that requires less assessment and interpretation of plant conditions by the operating crews. AOPs have also been enhanced to improve usability and to provide guidance that is more comprehensive.

##### 3.1.4.2 Emergency Plan Implementing Procedures

In 1995, SQN updated the classification methodology to NUMARC/NESP-007, Revision 2, “Methodology for Development of Emergency Action Levels.” SQN Emergency Action Levels (EALs) incorporate enhancements over the NRC and Federal Emergency Management Agency (FEMA) guidelines contained in Appendix 1 of NUREG-0654/FEMA-REP-1, Revision 1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power

Plants” including the use of an overview matrix of EAL initiating conditions and threshold values that streamlines the process of evaluating EALs against plant conditions in the applicable Emergency Plan Implementing Procedures (EPIPs).

### 3.1.5 Training Improvements

#### 3.1.5.1 Operations Training

Training is used to drive and sustain performance at SQN. Training is administered through the application of the Systematic Approach to Training (SAT) to ensure that all training is conducted to the industry-accepted standards required to achieve and maintain accreditation by the National Academy of Nuclear Training.

A dynamic plant simulator is used during Operations Training to provide hands-on experience and practice in the operation of the nuclear control room during normal, abnormal, and emergency plant conditions. “As found” simulator performance evaluations are an integral component of the requalification training cycle. The program description document, TPD-LOR, “Fleet Licensed Operator Requalification Training Program Description” addresses the use of “As found” evaluations. Evaluation scenarios are designed to be realistic and provide an opportunity for performance evaluation during a wide range of plant operating conditions including emergency conditions that require implementation of the station’s REP. Scenarios can vary in both length and complexity with some scenarios exceeding 90 minutes or more. Periodically, scenarios that were developed in accordance with the guidance specified by Institute of Nuclear Power Operations (INPO) Operations Department Standing Instruction ODSI-3 are used for control room team evaluations. These scenarios provide additional challenges to the crew’s ability to prioritize activities to successfully manage complex situations. The proficiency of the control room team is evaluated in the areas of diagnosis of events/conditions based on signals/readings, understanding of plant and system responses, procedure use and adherence, control board operations, crew operations, communications, and operator fundamentals. TVA Procedure NPG-SPP-17.8.1, “Licensed Operator Requalification Examination Development and Implementation,” and TPD-LOR are the governing documents for this training.

#### 3.1.5.2 Shift Technical Advisor Training

The Shift Technical Advisor (STA) training was developed to train the STA as an advisor to the control room team in accordance with the guidelines of NUREG-0737. In 1990, INPO

developed additional training guidelines as detailed in INPO 90-003, "Guidelines for Training and Qualifications of Shift Technical Advisors." The INPO guidelines describe the role of the STA and are reflected in TVA Operations Department Procedure OPDP-1, "Conduct of Operations." The STA performs independent assessments of plant parameters, monitors status trees, provides recommendations on appropriate corrective actions to restore plant parameters to acceptable values, and assesses whether core damage has occurred or appears imminent. The STA also assists the Shift Manager with operability, risk, and reportability determinations.

### 3.1.6 Increases in On-Shift Staffing

Since the original emergency plan approval, on-shift staffing has increased to ensure adequate performance of the major emergency plan functions and tasks. In the current SQN Emergency Plan, a total of 24 individuals are identified for on-shift staffing, which is an increase from the regulatory guidance provided by NUREG-0654, Revision 1, total of 10 individuals. This staffing is also in excess of the number of individuals required by the SQN Emergency Plan, Revision 0, which approved staffing of 16 individuals. A comparative chart depicting on-shift and augmented staffing based on NUREG-0654, Revision 1; SQN Emergency Plan, Revision 0; the current SQN Emergency Plan; and proposed revisions is included in Attachment 3.

### 3.1.7 Improvement Summary

The improvements to staffing, equipment, procedures and training that have occurred since the initial approval of the SQN Emergency Plan have resulted in a significant increase in the on-shift capabilities and knowledge. Based on these improvements, TVA concluded that there would be no significant degradation or loss of any functional task as a result of the proposed augmentation times.

## 3.2 Functional Analysis

This analysis evaluates the effect of extending the augmentation times on the ability of the on-shift staff to perform the major tasks for the major functional areas of the SQN Emergency Plan. The analysis demonstrates that no degradation or loss of function would occur as a result of the change.

The following is the result of the functional analysis performed for the major functional areas described in NUREG-0654, Revision 1, Table B-1. In general, the analysis is organized to provide details for each functional area for: (a) SQN Emergency Plan Revision 0, (b) the current SQN Emergency Plan, and (c) the proposed SQN Emergency Plan.

### 3.2.1 Plant Operations and Assessment of Operational Aspects

NUREG-0654, Revision 1, assumes the function of plant operations and assessment of operational aspects is performed by on-shift staff throughout the emergency. Compared to NUREG-0654, Revision 1, the current plan has 6 additional Auxiliary Unit Operators (AUOs) and 1 additional Senior Reactor Operator (SRO) to support this function and to support any of the major tasks such as repair and corrective actions or operational accident assessments. These changes improve the availability of Operations personnel to perform specified functions.

In the current SQN Emergency Plan, the on-shift Operations staffing exceeds the guidance of NUREG-0654, Revision 1 Table B-1, as well as that prescribed in the last approved Plan from 1988. Additional personnel have been included in the existing on-shift complement for a total on-shift staffing of 24 personnel. This represents an increase of 14 when compared to the regulatory guidance stated in NUREG-0654, Revision 1, Table B-1 and an increase of 8 when compared to the last NRC approved Emergency Plan in 1988. The additional on-shift staff helps to ensure prompt response to emergency events without requiring immediate augmentation.

In the proposed Emergency Plan, Figure B-2 has been reformatted to more closely align with NUREG-0654, Revision 1, Table B-1. Additionally, Figure B-2 includes augmented response positions that are credited with command and control functions as defined in the Emergency Plan. The total number of on-shift staff continues to exceed NUREG-0654, Revision 1, Table B-1 values. As stated in Section 3.1, an on-shift staffing analysis determined that the proposed changes did not result in conflicting duties for on-shift staff. Therefore, the proposed increase in augmentation times will not detract from the capability of on-shift personnel to support plant operations or the assessment of operational aspects major task.

### 3.2.2 Emergency Direction and Control

NUREG-0654, Revision 1 guidance indicates that the on-shift Emergency Coordinator assumes this function as a collateral duty of the STA or designated manager, where responsibility for overall direction of facility response may be transferred when ERFs are activated.

- a. In Revision 0 of the SQN Emergency Plan, the Shift Operations Supervisor would assume the duties of the SED and would be responsible for emergency response efforts until relieved by the Plant Manager or alternate. No time requirements were established for the relief process. However, the SED and the CECC Director were identified as 60-minute response positions. Revision 4 of the SQN Emergency Plan identified the staffing time for the CECC as approximately 60 minutes and Revision 14 included the requirement for the TSC and OSC to be activated within approximately 60 minutes of a declaration of an Alert or higher classification.
- b. The current revision of the SQN Emergency Plan maintains Revision 14 response requirements for the TSC, OSC, and CECC.
- c. Under the proposed Emergency Plan, the activation times for the TSC, OSC and CECC are maintained at 60 minutes.

The proposed change standardizes application of the term 'activated' with respect to responder readiness to perform response actions in each facility and defines the facility as 'activated' once minimum activation staff positions (MASP) have been filled such that the facility is capable of performing command and control functions. This definition is aligned with NSIR/DPR-ISG-01 guidance and replaces terms such as 'staffed' and 'operational' as used in the current revision of the SQN Emergency Plan. The time from the applicable emergency declaration to the time the facility is activated is the "augmentation time" for emergency responders.

The proposed change aligns the TSC, OSC, and CECC activation criteria while maintaining support for relief of the Shift Manager and SED. Identification of MASP within each facility allows for facility activation in advance of the 60-minute response time.

The proposed revision to SQN Emergency Plan Appendix B, Figure B-1, identifies MASP in the TSC and OSC, which support activation of the facilities within 60 minutes of an Alert or higher classification as:

- Site Emergency Director (TSC)
- RP Manager
- Operations Manager
- Operations Communicator
- Main Control Room (MCR) Communicator
- Technical Assessment Manager (TAM) or Technical Assessment Team Leader (TATL)
- OSC Manager

The current SQN Emergency Plan REP Generic, Figure 3-1, identifies MASP in the CECC that support activation of the facility within 60 minutes of an Alert classification:

- CECC Director
- Emergency Duty Officer (EDO)/REP Staff Representative(s)
- Plant Assessment Manager
- State Communicator
- Radiological Assessment Manager
- Dose Assessor

This submittal does not propose changes to CECC staffing currently identified in REP Generic Figure 3-1.

The response times for the support positions in the TSC and OSC, as noted in revised Figure B-1, are extended from 30 and 60 minutes to 90 minutes.

Upon declaration of an Alert or higher classification, the command and control functions of Classification, Notification and Protective Action Recommendations transition from the Control Room to the TSC and CECC upon activation of those facilities. The proposed changes include a diagram in Appendix B that shows the transfer process for the command and control functions.

This change is acceptable in that it identifies minimum activation staffing positions in the TSC, OSC, and CECC, which enable transfer of the command and control functions from the control room in advance of the 60-minute activation requirement.

### 3.2.3 Notification/Communication Function

Per NUREG-0654, Revision 1, the Notification/Communication function included major tasks to notify licensee, state, local, and federal personnel and maintain communications.

#### **Licensee Notification**

- a. Revision 0 of the SQN Emergency Plan identified notification of licensee off duty personnel by the TVA Operations Duty Specialist (ODS). This notification was completed at an Alert or higher classification for personnel assigned to respond to the TSC, OSC and CECC.
- b. The current SQN Emergency Plan maintains notification of off duty ERO by the ODS in accordance with implementing procedures at an Alert or higher classification for augmented responders in the TSC, OSC and CECC.

- c. The proposed SQN Emergency Plan maintains the Revision 0 notification process for augmented ERO in that personnel responding to the TSC, OSC and CECC will be notified at the Alert or higher classification by the ODS.

### **State, Local and Federal Notification**

- a. In Revision 0 of the ONP-REP, the ODS was identified as the position responsible for notification of State/local personnel. Federal notifications were completed by the Shift Manager and SED. In Revision 56 of the SQN Emergency Plan, responsibility for federal notification via the Emergency Notification System (ENS) was assigned to a licensed operator position that had been added to the on-shift staff. In Revision 97 of the SQN Emergency Plan, responsibility for the state/local notification was assigned to the Shift Manager. The state/local notification function then transitioned to the CECC Director when that facility was activated. The CECC Director was a 60-minute response position. Responsibility for federal notifications transitioned from the control room licensed operator to the NRC Coordinator in the TSC where it remained for the duration of the event.
- b. The current SQN Emergency Plan maintains the on-shift and augmented organization for the State/local and federal notification functions as described in Revision 97.
- c. The proposed SQN Emergency Plan revises the state/local and Federal notification process by transitioning responsibility for state/local notifications from the Control Room to the State Communicator in the CECC and Federal notifications to the Operations Manager in the TSC. The transition will continue to occur at approximately 60-minutes after declaration of an Alert or higher classification. The NRC Coordinator will assume the Federal notification duties from the Operations Manager approximately 90-minutes after declaration of an Alert or higher classification.

### **Notification/Communication Function Summary**

Notification of licensee personnel is accomplished through an automated call-out process, which is initiated by the ODS. The proposed change does not affect the call-out process or the notification of licensee personnel.

The proposed revision to the SQN Emergency Plan does not adversely affect staffing associated with the notification function. The proposed SQN Emergency Plan maintains the personnel on-shift to ensure that federal notification functions are completed without conflicts as noted in the site On-Shift Staffing Analysis. State/local notifications will transition

from the Shift Manager/SED in the Control Room to the State Communicator upon activation of the CECC within approximately 60 minutes under the proposed revision. ENS notifications will continue to transition from the Control Room to the TSC within 60 minutes as required under the current plan.

#### 3.2.4 Radiological Accident Assessment and Support of Operational Accident Assessment Function

Per NUREG-0654, Revision 1, the Radiological Accident Assessment and Support of Operational Accident Assessment functional area includes the Emergency Operations Facility (EOF) Director, Off-site Dose Assessment, Off-site, On-site, and Out-of-plant surveys and the Chemistry/Radiochemistry major tasks.

##### **EOF Director Major Task**

Revision 0 of the SQN Emergency Plan identified the TSC as the initial response facility. Accident assessment, evaluation, and recovery functions were transitioned from the Shift Operations Supervisor in the Control Room to the SED who operated from the TSC rather than to an EOF position noted in NUREG-0654, Revision 1.

##### **Assessment, Evaluation and Recovery Task**

- a. In Revision 0 of the SQN Emergency Plan, the Shift Operations Supervisor, serving as the SED, was in charge of all activities at the site. The Shift Operations Supervisor/SED maintained responsibility for emergency assessment and evaluation functions until relieved by the TSC SED at an Alert or higher classification. The TSC SED was a 60-minute responder.
- b. The commitment for the 60-minute response time for the SED in the TSC is maintained in the current SQN Emergency Plan.
- c. In the proposed revision, the augmentation time for the SED in the TSC is maintained at 60 minutes and is included in Figure B-1 of Appendix B.

##### **Assessment, Evaluation and Recovery Task Summary**

The proposed change to the SQN Emergency Plan does not alter the length of time that the assessment, evaluation and recovery tasks are maintained by the Shift Manager until relieved by the SED in the TSC.

##### **Command and Control Task**

- a. In Revision 0 of the SQN Emergency Plan, the Shift Operations Supervisor, acting as the SED was responsible for event response until relieved by the SED in the TSC at an Alert or higher

classification. Upon staffing the CECC, overall command and control of the event was transitioned from the SED in the TSC to the CECC Director. Revision 14 included activation of the TSC and CECC within 60 minutes of an Alert or higher classification.

- b. The current SQN Emergency Plan maintains Revision 14 sequence of transfer of command and control functions from the Control Room to the TSC and, subsequently, to the CECC at an Alert or higher classification.
- c. The proposed change maintains facility activation times of 60 minutes for the TSC, OSC, and CECC. TSC and OSC minimum staff positions as identified in the proposed SQN Emergency Plan, Figure B-1, as well as CECC positions identified in Figure 3-1, are considered 60-minute responders who are required to be in place and ready to accept command and control functions in order for the facility to be declared 'activated.' These positions are related to the command and control functions of Classification, Notification, Protective Action Recommendations (PARs), and Emergency Exposure authorization based on guidance in NSIR/DPR-ISG-01. Once these positions are staffed and ready to accept command and control functions, command and control can be transitioned from the Control Room. A diagram that outlines the transition of command and control functions has been added to Appendix B in Section B.5. These changes allow for transition of command and control functions from the Control Room to the TSC in advance of the 60-minute response requirement allowing for earlier relief of on-shift staff of event-related tasks.

### **Command and Control Task Summary**

The proposed revision to the SQN Emergency Plan maintains the requirement for staffing the TSC, OSC, and CECC at the Alert or higher event classification level and revises specific positions associated with command and control responsibilities based on guidance in NSIR/DPR-ISG-01, so that transfer of these functions can occur earlier in the response process. As a result, the proposed changes do not adversely affect performance of command and control functions.

### **Off-site Dose Assessment Major Task**

- a. In Revision 0 of the SQN Emergency Plan, on-shift performance of dose assessment was not specifically discussed. In Revision 56, the Chemistry Shift Supervisor was identified as being responsible for performance of this function. In Revision 84, the on-shift dose assessment function was re-assigned from Chemistry to RP personnel. The dose assessment function transitioned to the RP Manager in the TSC or the Dose Assessor in the CECC, which is a 60-minute response position, upon activation of those facilities.
- b. The current Plan maintains performance of the dose assessment function by RP personnel on-shift as noted in Revision 84 as well as the transition to augmented ERO positions.
- c. In the proposed change, performance of the on-shift dose assessment function is assigned to the on-shift Chemistry Technician. This change supports the performance of radiological assessment and protective action functions by on-shift RP personnel. It was noted during the On-Shift Staffing Analysis that collection of Chemistry samples is not required within the first 60 minutes after an event. As a result, the Chemistry Technician on-shift is available to perform the dose assessment function without conflicts until relieved by either the TSC Radiological Protection Manager in the TSC or the CECC Dose Assessor when those facilities are activated within 60 minutes of event declaration.

### **Off-site Surveys Major Task**

- a. In Revision 0 of the SQN Emergency Plan, off-site surveys were initiated by the Radiological Assessment Manager in the CECC at a Site Area Emergency or higher classification with one sampling team dispatched within 30 minutes and a second sampling team within 60 minutes.
- b. The current SQN Emergency Plan maintains the commitment for initiation of off-site surveys at a Site Area Emergency or General Emergency classification, with the first sampling team dispatched within 30 minutes and an additional sampling team within 60 minutes.
- c. In the proposed change, augmentation is extended such that the first off-site sampling team is dispatched at 60 minutes and the second team at 90 minutes after an Alert or higher classification rather than 30 and 60 minutes, respectively, at a Site Area Emergency or higher classification.

A review of field team monitoring functions shows that the use of in-plant and effluent monitors effectively supports event classification

as well as on-site and off-site protective actions such that performance of this major task at 60 minutes does not adversely affect site response. Initial field team response primarily involves environmental radiation and contamination assessments, plume tracking, and using dose assessment instrumentation. Actions include driving to and from field positions, reading dose rate instrumentation, and communicating results to the TSC and/or CECC. The first sampling team can effectively track any potential plume and/or cover the necessary area to identify whether a plume exists during the early stages of an event. The second sampling team, augmented at 90 minutes, would support continued plume tracking capability as well as sampling activities.

Initiation of environmental sampling at a lower classification level continues to support timely performance of the function. Therefore, this change does not adversely affect performance of the off-site survey major task and is consistent with industry and NRC public meeting discussions that have taken place over the last 12 to 24 months.

#### **On-site (out of plant) Major Task**

- a. Revision 0 of the SQN Emergency Plan identified 2 Radiological Control (RadCon) Technicians (Techs) on-shift who were responsible for performance of activities associated with radiological accident support and on-site protective actions as outlined in site procedures. A RadCon Manager position was augmented as soon as possible after notification and provided oversight of these functions, and augmentation by 6 RP individuals at 30 minutes and 6 RP individuals at 60 minutes was specified. Additionally, the Radiological Assessment Manager (RAM) position in the CECC was augmented at 60 minutes.
- b. The current SQN Emergency Plan maintains the Revision 0 commitment to augment on-shift RP positions at 30 minutes by 6 RP individuals and supplement this effort with an additional 6 RP individuals at 60 minutes.
- c. The proposed change revises the structure for RP support of event response and modifies the augmentation requirements from a total of 6 RP individuals at 30 minutes to a total of 3 RP individuals at 60 minutes and from a total of 6 additional RP individuals at 60 minutes to a total of 3 additional RP individuals at 90 minutes. The proposed change revises the commitment for the number of responders at 60 and 90 minutes to better coincide with the number of individuals required to perform radiological assessment and protective measure functions.

On-site (out of plant) survey teams are typically used to verify the status of a potential release. Installed effluent radiation monitors and in-plant radiation monitors would be able to detect any radioactive release quickly and accurately. The enhanced technology provided by the ICS and the dose assessment process provides immediate indication of dose at the site boundary, 2-mile radius, and 5-mile radius. Quantification of a radioactive release is determined by dose assessment that can be performed on-shift. On-site, out of plant surveys can be used for verification of release or downwind monitoring as needed. Off-site survey data is used to validate dose assessment. An off-site survey would be available after the first 60 minutes following emergency classification.

Review of on-site monitoring functions shows that the use of in-plant and effluent monitors effectively supports event classification and on-site radiological assessment activities such that performance of this major task at 60 minutes rather than 30 minutes does not adversely affect site response. The proposed change does not adversely affect performance of the on-site surveys major task and is consistent with industry and NRC public meeting discussions that have taken place over the last 12 to 24 months.

#### **In-Plant Surveys Major Task**

- a. Revision 0 of the SQN Emergency Plan identified 2 RadCon Technicians on-shift for the performance of radiological response functions. A RadCon Manager position was augmented as soon as possible after notification and provided oversight of these functions. An additional 6 RP individuals at 30 minutes and 6 RP individuals at 60 minutes were augmented. Additionally, the Radiological Assessment Manager (RAM) position in the CECC was augmented at 60 minutes.
- b. The current SQN Emergency Plan maintains the Revision 0 commitment for 2 on-shift RP individuals responsible for event related activities on-site as well as augmentation by additional RP individuals at 30 and 60 minutes.
- c. The proposed change maintains the commitment for 2 on-shift RP individuals responsible for event related activities and extends the response time for a total of 6 augmented RP individuals from 30 minutes to a total of 3 RP individuals at 60 minutes and a total of 6 additional RP individuals from 60 minutes to a total of 3 additional RP individuals at 90 minutes. As previously stated in Section 3.1.1, benefits of the current level of computer upgrades include:

- Programming capability for automated response such as indication of critical parameter alarms.
- Improved plant monitoring capability for Emergency Director functions
- Fewer keystrokes required to switch between graphical displays
- Real time plant data available through graphical display
- Real time read-only plant data is available on any desktop computer throughout the corporate network

The use of improved access to real-time plant data allows on-shift RP resources to provide the necessary support for the performance of on-site and in-plant functions for an additional 30 minutes without conflicts.

This approach is consistent with industry and NRC public meeting discussions that have taken place over the last 12 to 24 months.

### **Chemistry/Radiochemistry Major Task**

- a. Revision 0 of the SQN Emergency Plan included 2 on-shift Chemistry (Chem) Lab Technicians, with an additional Chem Lab Technician augmented at 60 minutes. Revision 56 of the Plan reduced the number of on-shift Chemistry personnel from two to one as part of the implementation of NRC approved license amendments 233 for SQN Unit 1 and 243 for SQN Unit 2 (Reference 3), which reduced the number of chemistry tasks by eliminating some chemical analyses and deferring others for 8 to 24 hours after an accident condition. This change reduced the number of Chemistry Technicians required on-shift. There was no change to the augmented response requirement.
- b. The current SQN Emergency Plan maintains an on-shift Chemistry Technician with augmentation by a second Chemistry Technician in 60 minutes as described in Revision 56. The on-shift and augmented Chemistry Technicians are responsible for completion of chemistry samples and analysis.
- c. The proposed change maintains the commitment for the on-shift Chemistry Technician position, transitions the dose assessment function to this position and extends augmentation of a second Chemistry Technician to 90 minutes. TVA determined in the On-Shift Staffing Analysis that collection of Chemistry samples is not required within the first 90 minutes after an event. As a result, re-assignment of dose assessment and extension of the augmented response time by 30 minutes will not adversely affect performance of the Chemistry/Radiochemistry Major Task.

### **Off-site Dose Assessment, Off-site Survey, On-site (out of plant), In-Plant Survey and Chemistry/Radiochemistry Major Task Summary**

The Dose Assessment, Off-site Survey, On-site (out of plant), In-Plant Survey, and Chemistry/Radiochemistry major tasks are affected by the proposed change. Reassignment of the dose assessment function to on-shift Chemistry aligns with the delayed need for performance of chemistry sampling as determined by the OSA and does not conflict with on-shift responsibilities. In-Plant Survey and On-site (out of plant) tasks would be performed by on-shift RP individuals for an additional 30 minutes before augmentation by additional RP personnel. The improved use of in-plant, effluent, and area radiation monitors effectively supports event classification and on-site radiological assessment activities such that performance of these major tasks at 60 minutes rather than 30 minutes does not adversely affect site response. Off-site Surveys would be performed by the first Sampling Team at 60 minutes rather than 30 minutes after the event. Initiation of environmental sampling at a lower classification level continues to support timely performance of the function even with the extended dispatch time, therefore, this change does not adversely affect performance of the off-site survey major task.

#### **3.2.5 Plant System Engineering, Repair, and Corrective Actions Function**

Per NUREG-0654, Revision 1, the Plant System Engineering, Repair, and Corrective Actions functional area includes Technical Support and Repair and Corrective Actions Major Tasks. NUREG-0654, Table B-1 notes that Mechanical Maintenance/Radwaste Operator and Electrical Maintenance/Instrument and Control Technician expertise may be provided by shift personnel assigned other functions.

#### **Technical Support Major Task**

- a. Revision 0 of the SQN Emergency Plan included an STA on-shift position that was responsible for operational aspects and reported to the Shift Operations Supervisor. The Core Thermal Hydraulics function was augmented at 30 minutes by a Reactor Engineer and reported to the Technical and Engineering Supervisor in the TSC. Staffing by Electrical and Mechanical Engineering was augmented at 60 minutes after the event. In Revision 23, the augmented response time for the Reactor Engineer changed from 30 minutes to 60 minutes. This change was approved by Letter from the NRC to SQN dated January 4, 1995 (Reference 2).

- b. The current Plan maintains the Revision 23 commitment for the Reactor Engineer position in the TSC with a response time of 60 minutes from an Alert or higher classification. This position is responsible for monitoring and trending of key plant parameters, determining the condition of the reactor and nuclear fuel and providing assessment of plant conditions. Subsequent staffing by Electrical and Mechanical Engineering continues to take place at 60 minutes after the event.
- c. The proposed change adds the Technical Assessment Manager (TAM) and the Technical Assessment Team Leader (TATL) as 60-minute response positions, both of which would be qualified to perform Core Thermal Hydraulics functions. Additionally, the response times for the Reactor Engineer, Electrical, and Mechanical Engineering positions are extended to 90 minutes. The change maintains the capability for transfer of the Core Thermal Hydraulic engineering function from the Control Room to the TSC at 60 minutes after the event. As a result, there is no adverse effect to performance of the function.

#### **Repair and Corrective Actions Major Task**

- a. Revision 0 of the SQN Emergency Plan included 3 maintenance personnel on-shift. Maintenance positions were augmented at 30 and 60 minutes by Mechanical Maintenance and Electrical Maintenance craft personnel.
- b. The current SQN Emergency Plan maintains the commitments for on-shift and augmented Maintenance personnel at 60 minutes following an Alert or higher classification.
- c. The proposed change realigns maintenance response by removing maintenance personnel from on-shift while maintaining the response time for the augmented Electrical Maintenance and Mechanical Maintenance craft positions at 60 minutes. The proposed change also extends the Instrumentation and Controls (I&C) Maintenance craft augmented position from 60 minutes to 90 minutes from the time of an Alert or higher classification.

The basis for inclusion of maintenance personnel on-shift was related to normal plant operations and maintenance work scheduling rather than response activities. A detailed review of maintenance procedures indicated that significant repair activities would not be initiated for several hours after an event occurred.

Based on discussions at NRC Public Meetings, the primary concern for on-shift and augmented maintenance capabilities is the repair and restoration of the ECCS. Section 3.1 of the SQN Updated Final

Safety Analysis Report (UFSAR) states that each of the SQN Engineered Safety Features (ESFs) conforms to the single failure criterion as defined in 10 CFR 50 Appendix A such that the occurrence of a single failure during the recovery period following an incident will not result in the loss of the associated safety function.

10 CFR 50, Appendix A, General Design Criterion (GDC) 35, *Emergency core cooling*, states:

A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

Section 3.1 of the SQN UFSAR documents that the SQN ECCS design and safety analysis is in accordance with the NRC's (AEC) Interim Acceptance Criteria for the Performance of Emergency Core Cooling Systems for Light-Water Power Reactors of June 1971. By combining the use of passive accumulators, centrifugal charging pumps, safety injection pumps and residual heat removal pumps, emergency core cooling is provided even if there should be a failure of any component in any system. The ECCS employs a passive system of accumulators that do not require any external signals or source of power for their operation to cope with the short-term cooling requirements of large reactor coolant pipe breaks. Two independent and redundant pumping systems are provided for smaller break protection and to cool the core after the accumulators have discharged following a large break. These systems are arranged so that the single failure of any active component does not prevent meeting the short-term cooling requirements.

To support the objective of the single failure criterion, the SQN ECCS incorporates a diverse and redundant system design. The ECCS consists of redundant trains of charging pumps, safety injection pumps, and residual heat removal pumps and heat exchangers in addition to a cold leg injection accumulator on each of the 4 Reactor Coolant System cold legs. The ECCS trains are separated electrically

and mechanically to ensure no single failure on any one train would preclude the other train from fulfilling the required safety function. Normal operating status and deviations from this status is controlled by the SQN Technical Specifications. System performance is tracked and trended by the site and demonstrates a high degree of reliability. System health requirements are maintained based on NRC Performance Indicators for system availability and functional failures that are an integral part of the Reactor Oversight Process (ROP). Additionally, reliability is driven by Maintenance Rule performance criteria.

Crediting the robust ECCS capability and protection against single point failures provides the basis for removal of maintenance personnel from on-shift and extension of augmentation response times for these positions to 60 minutes. As a result, the proposed changes do not result in a reduction in response capability.

### **Plant System Engineering, Repair, and Corrective Actions Function Summary**

The Plant System Engineering, Repair, and Corrective Actions functions are not adversely affected by the proposed change. Core thermal hydraulics major tasks will continue to be performed by on-shift personnel and transition to the TSC within approximately 60 minutes. Removal of on-shift maintenance personnel does not affect performance of the Repair and Corrective Action major task.

#### **3.2.6 Protective Actions (In-Plant) Function**

Per NUREG-0654, Revision 1, the Protective Actions functional area includes the Radiation Protection major task, specifically Access Control, Health Physics (HP) Coverage for repair and corrective actions, search and rescue first aid and firefighting, personnel monitoring and dosimetry. NUREG-0654 Table B-1 notes that HP Technician expertise may be provided by on-shift personnel assigned other functions.

- a. Revision 0 of the SQN Emergency Plan provided for 2 on-shift RP positions and augmented response via activation of a total of 6 RP positions within 30 minutes and a total of 6 additional RP positions within 60 minutes.
- b. The current Plan maintains the on-shift and augmented RP response as stated in Revision 0 of the SQN Emergency Plan.
- c. The proposed Plan maintains the 2 on-shift RP positions and extends the response time for the 30 and 60-minute responders to 60 and 90 minutes respectively. Justification for these changes is addressed in the paragraphs below.

## **Access Control/Dosimetry**

The performance of access control and dosimetry activities is primarily completed through the use of Electronic Dosimetry (ED), which is obtained prior to entry into radiologically controlled areas (RCA). The ED is also used as a “key” to unlock turnstiles to gain access to the RCA. Radiation work permits (RWPs) establish the necessary preset warnings/alarms associated with the ED. Specific emergency RWPs have been developed for use during a declared emergency, which automatically provide the ED with emergency dose and dose rate alarms. Site procedures detail the instructions for set-up and operation of an ED. This activity ensures that the teams dispatched to the in-plant areas to perform activities during a declared emergency would be afforded ample warning/alarm prior to exceeding their allowed dose or dose rate. Use of the ED and RWP process eliminated the need for access control and dosimetry oversight by an RP Technician for the initial response actions to an event. The use of electronic systems for RWP creation and logging on/off the RWP has improved efficiency in the dispatch of personnel into the field and reduced the burden of the on-shift RP Technicians.

Through the use of improved access control technology, extension of the RP position response times from 30 to 60 minutes and 60 to 90 minutes does not adversely affect performance of the Access Control and Dosimetry major tasks.

## **HP Coverage for Repair and Corrective Actions, Search and Rescue First Aid and Firefighting**

The performance of the HP Coverage for Repair and Corrective action activities is the responsibility of the on-shift RP personnel. This function is supported by the use of electronic dosimetry for in-plant teams for the purpose of ensuring ample warning prior to exceeding allowed doses or dose rates. Additionally, area radiation monitoring capabilities have greatly improved through the implementation of electronic remote monitoring systems. By utilizing these systems, one technician is able to monitor numerous locations from the remote monitoring station.

Using improved radiological monitoring technology, extension of the RP position response time from 30 to 60 minutes to 60 and 90 minutes does not adversely affect performance of the HP Coverage for Repair and Corrective Actions, Search and Rescue First Aid and Firefighting major tasks on-shift.

## **Personnel Monitoring/Habitability**

The performance of personnel monitoring for on-shift event responders is provided by on-shift RP positions. This function would be performed for an additional 30 minutes by on-shift personnel as a result of the proposed

change. This function is supported by the use of electronic dosimetry for in-plant teams for the purpose of ensuring ample warning prior to exceeding allowed doses or dose rates. Additionally, electronic area radiation monitoring provides updated real time information for limited areas that allows the technicians to not only brief workers on the current radiation levels but also see immediately when changes to habitability might be taking place throughout the plant.

Performance of habitability activities are associated with the ERFs after they are staffed by augmented personnel. As augmentation of facility staffing and RP resources occurs simultaneously for each facility under the proposed change, performance of this function is not adversely affected.

### **Protective Actions (In-Plant) Function Summary**

The proposed change maintains the second on-shift RP technician for the Protective Action/HP Coverage task and extends the 30-minute response time for the personnel monitoring/habitability task to 60 minutes. Additionally, the proposed change extends the 60-minute response times for the Access Control and Dosimetry tasks to 90 minutes. As a result, on-shift RP personnel will maintain responsibility for these functions for an additional 30 minutes. SQN has implemented improvements in technology in the areas of electronic dosimetry and access control, which reduce the need for RP Technician actions in each of these areas during the early stages of event response.

Additionally, an extension of the response time for the RP personnel responsible for personnel monitoring/habitability coincides with the 60-minute activation time for emergency response facilities as described in the proposed SQN Emergency Plan. This approach is consistent with industry and NRC public meeting discussions that have taken place over the last 12 to 24 months.

The combination of added on-shift resources, improvements in technology and alignment of facility activation times ensure that performance of these functions is not adversely affected by the proposed change.

#### **3.2.7 Firefighting Function**

Per NUREG-0654, Revision 1, the Firefighting functional area is addressed by use of a Fire Brigade and managed in accordance with site Technical Specifications.

- a. In Revision 0 of the SQN Emergency Plan, Fire Fighting response was provided by on-shift personnel assigned other functions and augmented by the off-site local fire department. Revision 56 added

the reference to the on-shift Fire Brigade required by the Fire Protection Report.

- b. The current SQN Emergency Plan maintains the Firefighting function commitment through the use of the on-shift Fire Brigade required by the Fire Protection Report.
- c. The proposed change maintains this commitment by including the 5 on-shift Fire Brigade members in Figure B-2 of the SQN Emergency Plan. The current and proposed on-shift fire protection staffing was evaluated in accordance with the requirements of 10 CFR 50 Appendix E.IV.A.9 and found to be sufficient.

### 3.2.8 Rescue Operations and First-Aid Function

NUREG-0654, Revision 1, Table B-1 notes that this function may be provided by on-shift personnel assigned other functions.

- a. SQN Emergency Plan Revision 0 provided for first aid treatment for injured personnel by qualified on-shift personnel.
- b. The current SQN Emergency Plan maintains this commitment through the use of on-shift Fire Brigade who also serve as First Aid Responders.
- c. The proposed change does not alter this commitment, therefore, the Rescue Operations and First Aid functional area is not affected by the proposed change.

### 3.2.9 Site Access Control and Personnel Accountability Function

NUREG-0654 Rev 1, the Site Access Control and Personnel Accountability functional area is addressed by Security personnel in accordance with the Site Security Plan.

- a. In SQN Emergency Plan Revision 0, site access control and accountability was identified as a function of the Security Supervisor on-shift and is detailed in the Site Security EIPs.
- b. The current SQN Emergency Plan maintains this commitment through the Physical Security Plan.
- c. The proposed changes to the SQN Emergency Plan do not alter this commitment, therefore, the Site Access Control and Personnel Accountability functional area is not affected by the proposed change.

### 3.3 Conclusions

The proposed changes continue to support the functional areas of the Emergency Plan, continue to ensure the protection of the health and safety of the public and site personnel, and do not present a significant burden to the on-shift personnel.

Elimination of on-shift Maintenance positions and extending augmented response times from 30 and 60 minutes to 60 and 90 minutes, given the diverse and redundant capabilities of plant systems, do not adversely affect the site's ability to respond to an event nor do they delay performance of maintenance functions.

Additionally, re-alignment and extension of the RP staffing augmentation response times for a total of 6 RP individuals at 30 minutes to a total of 3 RP individuals at 60 minutes and a total of 6 additional RP individuals at 60 minutes to a total of 3 additional RP individuals at 90 minutes respectively, does not adversely affect the performance of radiological assessment or protective action functions associated with event response. TVA has incorporated new technologies in access control and dosimetry, installed in-plant monitoring capability and will transition the on-shift dose assessment function from RP to Chemistry such that the emergency response functions identified in the SQN Emergency Plan will continue to be performed. The proposed changes do not result in a reduced ERO capability to effectively respond to the emergency.

The proposed change extends the times at which the initial and secondary sampling teams are dispatched by 30 minutes each, however, sampling teams will be dispatched at an Alert or higher classification rather than at a Site Area Emergency or General Area Emergency. Initiation of environmental sampling at a lower classification will continue to support timely performance of the function even with the extended dispatch time.

Therefore, the proposed changes continue to ensure the SQN Emergency Plan will meet 10 CFR 50.54(q)(2), the requirements of 10 CFR 50 Appendix E, and the planning standards of 10 CFR 50.47(b).

## 4.0 REGULATORY EVALUATION

### 4.1 Applicable Regulatory Requirements/Criteria

Title 10 Code of Federal Regulations 50.47(b)(1) and (2):

- (b) The on-site and, except as provided in paragraph (d) of this section, off-site emergency response plans for nuclear power reactors must meet the following standards:
- (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, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.*
  - (2) *On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various on-site response activities and off-site support and response activities are specified.*

The existing Sequoyah Nuclear Plant (SQN), Units 1 and 2, Emergency Plan includes on-site and off-site emergency response plans that meet the requirements listed above. This License Amendment Request (LAR) proposes to remove maintenance personnel from shift, extend the current staff augmentation response times from 30 minutes to 60 minutes, and, in some cases, extend 60-minute response times to 90 minutes. The SQN Emergency Plan will continue to have on-site and off-site emergency response plans that meet 10 CFR 50.47(b).

Relevant portions of Title 10 Code of Federal Regulations 50.54(q) are as follows:

- (q) Emergency Plans
- (1)(iv) *Reduction in effectiveness means a change in an emergency plan that results in reducing the licensee's capability to perform an emergency planning function in the event of a radiological emergency.*

- (2) *A holder of a license under this part, or a combined license under part 52 of this chapter after the Commission makes the finding under § 52.103(g) of this chapter, shall follow and maintain the effectiveness of an emergency plan that meets the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).*
- (4) *The changes to a licensee's emergency plan that reduce the effectiveness of the plan as defined in paragraph (q)(1)(iv) of this section may not be implemented without prior approval by the NRC. A licensee desiring to make such a change after February 21, 2012, shall submit an application for an amendment to its license. In addition to the filing requirements of §§ 50.90 and 50.91, the request must include all emergency plan pages affected by that change and must be accompanied by a forwarding letter identifying the change, the reason for the change, and the basis for concluding that the licensee's emergency plan, as revised, will continue to meet the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).*

The existing SQN Emergency Plan meets the planning standards of 10 CFR 50.47(b) and 10 CFR 50 Appendix E as required by 10 CFR 50.54(q)(2). This LAR proposes to remove maintenance personnel from shift, extend the current staff augmentation response times from 30 minutes to 60 minutes and, in certain cases, from 60 minutes to 90 minutes. These proposed changes are considered a reduction in effectiveness as defined in 10 CFR 50.54(q)(1)(iv) and require submittal based on 10 CFR 50.54(q)(4). Therefore, Tennessee Valley Authority (TVA) is submitting this LAR pursuant to 10 CFR 50.90.

The SQN Emergency Plan will continue to meet the requirements of 10 CFR 50.54(q)(2) by maintaining the effectiveness of the Emergency Plan such that it meets the requirements of 10 CFR 50 Appendix E and the planning standards of 10 CFR 50.47(b).

Relevant portions of Title 10 Code of Federal Regulations Part 50 Appendix E.IV are as follows:

A. *Organization*

*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 and the means for notification of such individuals in the event of an emergency.*

- A.9. *By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that*

*would prevent the timely performance of their assigned functions as specified in the emergency plan.*

The existing SQN Emergency Plan includes a description of the organization, including definition of authorities, responsibilities, and duties of individuals. The current Emergency Plan (Generic Revision 106, Appendix B Revision 105) is in compliance with the 10 CFR 50 Appendix E.IV.A.9. This LAR proposes to remove maintenance personnel from shift and increase the current staff augmentation response times from 30 minutes to 60 minutes and in some cases from 60 minutes to 90 minutes. A staffing analysis has been performed to demonstrate continued compliance with 10 CFR 50 Appendix E.IV.A.9. The staffing analysis supports acceptability of this increase in staff augmentation times. The proposed changes to the SQN Emergency Plan will continue to describe the authorities, responsibilities, and duties of these individuals. Therefore, with the changes proposed in the LAR, the requirements of 10 CFR 50 Appendix E continue to be met.

NUREG-0654/FEMA-REP-1, Revision 1 (Reference 4)

NUREG-0654/FEMA-REP-1, Revision 1, Section II.B.5 states, in part:

*“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 on-site 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.”*

NUREG-0654, Revision 1 includes general guidance concerning the on-site emergency organization to allow licensees some flexibility in the number of on-shift staff required by emergency plans for responding to emergency events. NUREG-0654 guidance recommends that there be, in addition to on-shift personnel, 30-minute and 60-minute responders. The augmented ERO responders assume many managerial, engineering, and administrative duties from the on-shift personnel, allowing them to focus more fully on plant operations. NUREG-0654 also provides the guidance that augmentation time be measured from the declaration of the emergency. The current SQN Emergency Plan staffing in Figures B-1 and B-2 meets the intent of NUREG-0654, Table B-1. This LAR proposes to remove maintenance personnel from shift and extend the current staff augmentation response times from 30 minutes to 60 minutes and in some cases, from 60 minutes to 90 minutes. The proposed changes have been evaluated in a staffing analysis

performed to meet 10 CFR 50 Appendix E.IV.A.9 requirements. The proposed changes to the SQN Emergency Plan continue to meet the intent of NUREG-0654, Table B-1 (i.e., continues to cover the emergency functional areas in Table B-1). This change is in alignment with NUREG-0654, Section I.B.5.

#### 4.2 Precedent

The proposed SQN Emergency Plan changes are similar to changes submitted by other licensees, including Susquehanna (ML030830543), Fermi (ML112450464), River Bend (ML012710218), Watts Bar (ML041810056), and Point Beach (ML16118A154). Furthermore, the proposed SQN Emergency Plan changes and evaluation documented in this submittal continue to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50 Appendix E.

#### 4.3 No Significant Hazards Considerations Determination

In accordance with the requirements of 10 CFR 50.90, Tennessee Valley Authority (TVA) requests an amendment to facility Renewed Operating Licenses DPR-77 and DPR-79, for the Sequoyah Nuclear Plant (SQN), Units 1 and 2, respectively, to revise the Emergency Plan. Completion of an on-shift staffing analysis of the Emergency Response Organization (ERO) supported the proposed changes to remove maintenance personnel from shift and extend the staff augmentation times for ERO response functions from 30 to 60 minutes and, in some cases, from 60 to 90 minutes as described. TVA proposes to revise the ERO on-shift staff and augmentation response times in the SQN Emergency Plan.

TVA has evaluated the proposed amendment against the standards in 10 CFR 50.92, "Issuance of Amendment," and has determined that the operation of SQN in accordance with the proposed amendment presents no significant hazards. The TVA evaluation against each of the criteria in 10 CFR 50.92 follows.

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

Response: No.

The proposed removal of maintenance personnel from shift and extension in staff augmentation times has no effect on normal plant operation or on any accident initiator or precursor and does not affect the function of plant structures, systems, or components (SCCs). The proposed changes do not alter or prevent the ability of the ERO to perform their intended functions to mitigate the consequences of an accident or event. The ability of the ERO to respond adequately to radiological emergencies has been demonstrated as acceptable through a staffing analysis as required by 10 CFR 50 Appendix E.IV.A.9.

Therefore, the proposed SQN Emergency Plan changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed changes do not affect the accident analyses. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed), a change in the method of plant operation, or new operator actions. The proposed changes do not introduce failure modes that could result in a new accident, and the changes do not alter assumptions made in the safety analysis. This proposed change removes maintenance personnel from shift and extends the staff augmentation response times in the SQN Emergency Plan, which are demonstrated as acceptable through a staffing analysis as required by 10 CFR 50 Appendix E.IV.A.9. The proposed changes do not alter or prevent the ability of the ERO to perform their intended functions to mitigate the consequences of an accident or event.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No

Margin of safety is associated with confidence in the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public. The proposed change is associated with the SQN Emergency Plan staffing and does not affect operation of the plant or its response to transients or accidents. The change does not affect the Technical Specifications. The proposed changes do not involve a change in the method of plant operation, and no accident analyses are affected by the proposed changes. Safety analysis acceptance criteria are not affected by this proposed change. A staffing analysis and a functional analysis were performed for the proposed changes on the timeliness of performing major tasks for the functional areas of the SQN Emergency Plan. The analysis concluded that removal of maintenance personnel from shift and an extension in staff augmentation times would not significantly affect the ability to perform the required Emergency Plan tasks.

Therefore, the proposed changes are determined to not adversely affect the ability to meet 10 CFR 50.54(q)(2), the requirements of 10 CFR 50 Appendix E, and the emergency planning standards as described in 10 CFR 50.47(b).

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

#### 4.4 Conclusion

TVA has evaluated the proposed change against the applicable regulatory requirements and acceptance criteria. The proposed SQN Emergency Plan changes continue to assure that regulatory requirements and emergency planning standards associated with emergency response are met.

Based on the above evaluation, TVA has determined that operation of the facility in accordance with the proposed changes do not involve a significant hazards consideration as defined in 10 CFR 50.92(c), in that they do not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

### **5.0 ENVIRONMENTAL CONSIDERATION**

TVA has determined that the proposed changes would not revise a requirement with respect to installation or use of a facility or component located within the restricted area, as defined in 10 CFR 20, nor would they change an inspection or surveillance requirement. The proposed amendment does not involve (i) a significant hazards consideration, or (ii) authorize a significant change in the types or a significant increase in the amounts of any effluent that may be released off-site, or (iii) result in a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for a categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, the Tennessee Valley Authority concludes that pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

## 6.0 REFERENCES

1. NRC Letter to TVA, "Office of Nuclear Power - Radiological Emergency Plan, Revision 0 Docket Nos. 50-259, 50-260, 50-296, 50-327, and 50 328," dated November 1, 1988
2. NRC Letter to TVA, "Browns Ferry and Sequoyah Proposed Emergency Plan Changes," dated January 4, 1995
3. NRC Letter to TVA, "Issuance of Technical Specification Amendments for the Sequoyah Nuclear Plant, Units 1 and 2 (TAC Nos. M91979 and M91980) (TS 94-15)," dated March 16, 1999 (ML013320389)
4. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, November 1980
5. NRC Inspection Manual, Inspection Procedure 71114.01, "Exercise Evaluation," May 29, 2012
6. NSIR/DPR-ISG-01, "Interim Staff Guidance, Emergency Planning for Nuclear Power Plants," Revision 0, November 2011

**Attachment 1**

**Proposed Emergency Plan Sections (Mark-up)**

**Sub-Attachments:**

**1-A) Proposed TVA Radiological Emergency Plan (REP) (Generic Part) (Mark-up)**

**1-B) Proposed TVA REP Appendix B, Sequoyah Nuclear Plant (Mark-up)**

**Sub-Attachment 1-A**

**Proposed TVA Radiological Emergency Plan (REP) (Generic Part) (Mark-up)**

**(6 Pages Follow)**



**Radiological  
Emergency  
Procedure**

**RADIOLOGICAL EMERGENCY PLAN  
(GENERIC PART)**

**REP-Generic  
Rev. **XXX**  
Page 1 of 91**

Quality Related       Yes       No

Effective Date \_\_\_\_\_

Level of Use: Information Use

Prepared by: Josh Perrel

Reviewed by: \_\_\_\_\_  
Program Manager, EP Special Projects      Date

Concurred by: \_\_\_\_\_  
EP Manager (BFN)      Date

Concurred by: \_\_\_\_\_  
BFN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
EP Manager (SQN)      Date

Concurred by: \_\_\_\_\_  
SQN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
EP Manager (WBN)      Date

Concurred by: \_\_\_\_\_  
WBN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
Director, Emergency Preparedness      Date

Approved by: \_\_\_\_\_  
GM, Support Services      Date

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 18 of 91</b>
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### 3.2 Onsite Organization (continued)

3. This time could vary slightly, depending upon the time of day, weather conditions, immediate availability of personnel, and radiological conditions.
- E. The site emergency organization augments the shift operations crew.
1. If members of the site emergency organization are not present when an emergency occurs, the Shift Manager on duty, or a designated Unit Supervisor when acting as the Shift Manager, is designated the Site Emergency Director and acts for him until relieved by the Plant Manager or his alternate.
- F. Upon detection of a known or suspected emergency, the Shift Manager on duty refers to the site-EPIP-1 to determine the classification of the emergency.
1. After determining the classification of the incident, the Shift Manager assumes the responsibilities of Site Emergency Director and initiates the appropriate procedure referenced by site-EPIP-1.
  2. Staffing instructions for the site emergency support centers are specified in the site-EPIPs.
- G. Site procedures shall designate site personnel who shall staff the ENS and HPN (NRC FTS 2000 System) Communication Systems.
1. Site procedures shall designate the interface during TSC operation.
- H. Each site will at a minimum establish the following positions within its emergency response organization with corresponding responsibilities as outlined below. The site-specific appendix gives detailed staffing and organizational data, including additional positions deemed necessary by the site.

#### 3.2.2 Site Vice President (Watts Bar and Browns Ferry Only)

- A. The Site Vice President serves as a corporate interface for the SED, relieving him from duties which could distract from the SED's primary purpose of plant operations and accident mitigation activities. The Site Vice President provides assistance to the SED by providing TVA policy direction; directing site resources to support the SED in accident mitigation activities; and providing a direct interface on overall site response activities with NRC, DHS, or other Federal organizations responding to the site, CECC Director, or onsite media.
- B. At his discretion, he may provide an interface at the appropriate offsite location on the overall site response activities with State and local agencies, NRC region/corporate, or Joint Information Center. He also provides support to other emergency operation centers as necessary.

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#### 4.1.3 Alert (continued)

- B. The purposes of the Alert class are:
1. To ensure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring, if required; and
  2. To provide offsite authorities current status information.
  - ~~2.3.~~ **To ensure that monitoring teams are dispatched (Sequoyah only).**
- C. The Alert class is maintained until event termination or escalation to a higher class. The State authorities are notified and in turn notify the local authorities. Following closeout, State authorities are briefed and no later than the next working day a written summary of significant events which occurred is forwarded to the State.

#### 4.1.4 Site Area Emergency

- A. A Site Area Emergency is declared when events are in process or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or Hostile Action that results 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 Protective Action Guideline exposure levels beyond the site boundary.
- B. The purposes of the Site Area Emergency class are:
1. To ensure that response centers are staffed.
  2. To assure that monitoring teams are dispatched.
  3. To assure that personnel required for evacuation of nearsite areas are at duty stations if the situation becomes more serious.
  4. To provide current information for, and consultation with, offsite authorities and the public.
- C. The Site Area Emergency class is maintained until event termination or escalation to a higher class. The State authorities are notified and in turn notify the local authorities. Following closeout, State authorities are briefed and no later than the next working day a written summary of significant events which occurred is forwarded to the State.

#### 4.1.5 General Emergency

- A. A General Emergency is declared when events are in process or have occurred which 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 Protective Action Guideline exposure levels offsite for more that the immediate site area.
- B. The purposes of the General Emergency class are:

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## 5.1 Onsite

Upon detection of a known or suspected emergency, the Shift Manager on duty will utilize the site-EPIP-1 to determine the classification of the emergency. After determining the classification of the emergency, the SED will initiate the appropriate procedures referenced by the site-EPIP-1. Each procedure referenced by site-EPIP-1 gives specific instructions on staffing the TSC and OSC and for notifying the State, ODS, and NRC.

## 5.2 Offsite

Implementing procedures are provided to activate TVA and State emergency staffs. Essential emergency positions are covered on a 24-hour-a-day basis by duty personnel. Emergency centers are located to ensure rapid and effective response of personnel needed to assess and evaluate offsite conditions.

### 5.2.1 Notification of Unusual Event (NOUE)

Upon declaration of this class, the following actions are performed:

- A. The MCR notifies and relays the information to the State within 15 minutes of declaration of the event.
- B. The ODS in Chattanooga is notified of the event by the MCR and records the details of the event in accordance with the appropriate EPIP.
- C. The ODS notifies and relays the information to the EDO and CECC Director.
- D. The EDO keeps the CECC Director and the Public Information Manager informed of the situation as necessary.
- E. The PIM notifies the Site Communications Consultant; Director, Public Relations & Corporate Information; and TVA News Bureau (Knoxville).
- F. The SED augments plant shift personnel as necessary to initiate corrective or protective actions.

### 5.2.2 Alert

Upon declaration of this class, the following minimum actions are performed:

- A. Notifications described in Section 5.2.1 are performed.
- B. The CECC is staffed.
- C. Environmental sampling teams ~~are may be~~ dispatched for Sequoyah and may be dispatched at this classification level for Browns Ferry and Watts Bar.
- D. The TSC and the OSC are activated.
- E. The situation is analyzed and any appropriate corrective or preventive actions initiated.
- F. Hourly, or more often as necessary, the State agencies are updated through the CECC on appropriate plant status and environmental conditions as follows:

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### 9.2.1 General Information (continued)

This procedure is designed to direct the activities of the Meteorologist during a radiological emergency to provide a timely response, consistent and accurate meteorological information, and atmospheric transport and dispersion advice.

R. CECC-EPIP-18-TRANSPORTATION AND STAFFING UNDER ABNORMAL CONDITIONS

This procedure provides instructions for the transportation of TVA employees under certain limited circumstances. It also includes instructions for lodging and meals as necessary under those circumstances.

S. CECC-EPIP-19- POST ACCIDENT FUEL DAMAGE ASSESSMENT

This procedure provides a method to assess the degree of reactor core damage from measured fission product concentrations and interpretations of other plant parametric data under accident conditions. The procedure also provides guidance in obtaining necessary information to predict radionuclide releases (source term) from TVA nuclear plants during accident conditions.

T. CECC-EPIP-20- NOT ACTIVE AT THIS TIME

U. CECC-EPIP-21- EMERGENCY DUTY OFFICER PROCEDURE FOR NOTIFICATION OF UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY

This procedure is designed to direct the EDO in notifying key TVA organizations and contacts in the event of a Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency.

V. CECC-EPIP-22- OPERATIONS DUTY SPECIALIST TRANSPORTATION INCIDENTS INVOLVING A SHIPMENT OF RADIOACTIVE MATERIAL

This procedure directs the ODS in obtaining information concerning a transportation accident involving radioactive material.

W. CECC-EPIP-23- RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS

The objective of this procedure is to provide guidance and instructions to emergency personnel concerning transportation accidents involving radioactive materials.

### 9.2.2 Sampling Team

TVA has vans equipped to monitor the environment for radioactivity. Each site van has an air sampler, radiation measurement equipment, a generator, radio, and other assorted equipment. A detailed listing of the minimum required equipment is available in the CECC-EPIPs.

- A. These vehicles are dispatched for environmental monitoring for Site Area Emergency and General Emergency classifications **for Browns Ferry and Watts Bar and at the Alert or higher classification for Sequoyah.**

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### 9.2.2 Sampling Team (continued)

- B. They may be deployed for ~~lower~~ ~~the Notification of Unusual Event and Alert~~ classifications, if warranted.
- C. Van(s) are stationed at each site.
- D. Each team has the capability to:
  1. Obtain environmental samples for analysis.
  2. Make direct radiation readings.
  3. Collect air samples and analyze them for gross beta-gamma radioactivity over a range of energies.
  4. Collect air samples and analyze them for radioiodine in the field, to concentrations as low as  $10^{-7}$  microcuries/cc.
- E. Within 30 minutes (**60 minutes for SQN**) of ~~an~~ **the applicable** emergency declaration, one sampling team can be deployed from the plant for environmental assessment. Additional teams can be dispatched from other facilities. At least one additional team can be deployed within approximately one hour (**90 minutes for SQN**) of notification. Composition and activation of sampling teams are described in the EIPs.
- F. For the Site Area Emergency, and General Emergency classifications, teams are dispatched from the nearest location.
- G. They may be deployed for the Notification of Unusual Event or Alert, **as noted in 9.2.2.B**, if warranted. If necessary, teams can be transported in a helicopter or fixed-wing aircraft.
- H. The TSC Rad Protection Manager or CECC Environs Assessor can request assistance from a neighboring plant for environmental monitoring, if deemed necessary.
- I. TVA has aquatic monitoring teams located at Chattanooga, Tennessee and Athens, Alabama. These teams have boats that can be deployed to obtain samples from the river for subsequent analysis for radioactivity in the laboratories.
- J. State agencies have the responsibility to coordinate and evaluate offsite assessment actions. All environmental monitoring activities will be coordinated through the RMCC. State environmental monitoring capabilities and the RMCC operations are referenced in Appendix E. TVA will be co-located in the RMCC and coordination of TVA and State monitoring teams will be conducted from that point. Environmental monitoring data will be shared between the State and TVA.
- K. Additional environmental monitoring assistance can be obtained by contacting the DOE offices at Oak Ridge, Tennessee or Aiken, South Carolina. The EPA in Montgomery, Alabama can also provide assistance. Environmental monitoring teams and mobile radioanalytical laboratories can be supplied. The State agencies usually request and coordinate these services.

**Sub-Attachment 1-B**

**Proposed TVA REP Appendix B, Sequoyah Nuclear Plant (Mark-up)**

**(14 Pages Follow)**

**SQN**

**TENNESSEE VALLEY AUTHORITY  
NUCLEAR POWER  
RADIOLOGICAL EMERGENCY PLAN**

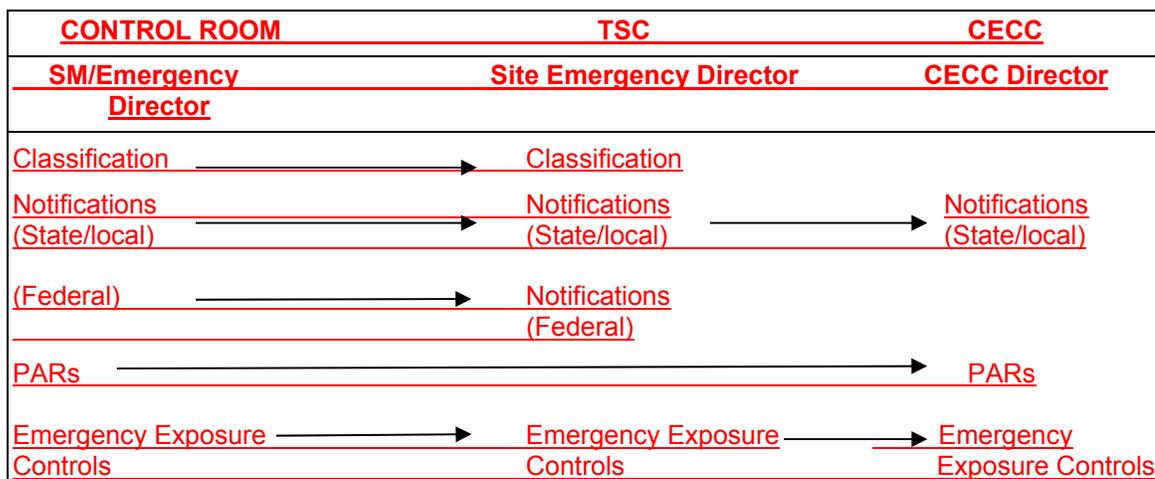
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APPENDIX B  
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**APPENDIX B**

**SEQUOYAH  
NUCLEAR PLANT**

## B.5 SITE EMERGENCY ORGANIZATION

SQN maintains an organization capable of responding to a radiological emergency. The TSC, and OSC, and Control Room staffing for response to emergencies is shown on Figure B-1. Figure B-1 also identifies minimum staff positions required to activate the TSC and OSC. Facility activation will be completed within 60 minutes of an Alert or higher classification. The minimum on shift emergency response staffing is shown in Figure B-2. The Command and Control transfer process is outlined in the diagram below.



### **Transition of Command and Control Functions**

#### B.5.1 Emergency Response Positions

TSC and OSC emergency response positions are described in SQN EPIP-6, "Activation and Operation of the Technical Support Center" and SQN EPIP-7, "Activation and Operation of the Operations Support Center."

##### ~~B.5.1.1 Site Vice President~~

~~The Site Vice President serves as a corporate interface for the SED, relieving him from duties which could distract from the SED's primary purpose of plant operations and accident mitigation activities. The Site Vice President shall provide assistance in the following areas:~~

- ~~1. Provides TVA policy direction to the Site Emergency Director.~~
- ~~2. Directs the site resources to support the Site Emergency Director in the accident mitigation activities.~~
- ~~3. Provides direct interface on overall site response activities with:
 
  - ~~a. NRC, FEMA, or other Federal organizations responding to the site.~~
  - ~~b. CECC Director.~~
  - ~~c. Onsite media.~~~~

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	NP-REP APPENDIX B Page B-165 Revision <del>XXX</del>
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- ~~4. At his discretion, may provide interface at the appropriate offsite location on the overall site response activities with:
 
  - ~~a. State and local agencies.~~
  - ~~b. NRC region/corporate.~~
  - ~~c. Joint Information Center.~~~~
- ~~5. Provides support to other emergency operation centers as necessary.~~

B.5.1.12 Site Emergency Director

1. Directs onsite emergency accident mitigation activities.
2. Consults with CECC Director ~~and Site Vice President~~ on significant events and their related impacts.
3. Initiates onsite protective actions.
4. Coordinates accident mitigation actions with NRC.
5. Initiates long-term 24-hour accident mitigation operations.
6. Prior to the CECC being ~~activated~~ **staffed**, makes recommendations for protective actions (if necessary) to State and local agencies through the Operations Duty Specialist. This responsibility cannot be delegated except to the CECC Director after the CECC is ~~activated~~ **operational**.
7. Responsible for determining the emergency classification. This responsibility cannot be delegated.
8. Approves or authorizes emergency doses. This responsibility cannot be delegated.

B.5.1.23 Operations Manager

1. Directs operational activities.
2. ~~Informs Site Emergency Director of plant status and operational problems.~~ **Accepts responsibility for Federal Notification function from the control room.**
- ~~3. Assures the control room is aware of the accident assessment and response.~~
- ~~4.~~ 3. Recommends solutions and mitigating action for operational problems.

B.5.1.3 Operations Communicator

1. Informs the Operations Manager of plant status and operational problems.
2. Assures the control room is aware of the accident assessment and response.
3. Provides support for performance of Federal Notification function.

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	NP-REP APPENDIX B Page B-166 Revision <del>XXX</del>
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#### B.5.1.4 Technical Assessment Manager

1. Directs onsite effluent assessment.
2. Directs activities of technical assessment team.
3. Projects future plant status based on present plant conditions.
4. Keeps assessment team informed of plant status.
5. Provides information, evaluations, and projects to Site Emergency Director.
6. Coordinates assessment activities with the CECC plant assessment team.
7. Establishes and maintains a status of significant plant problems.

#### B.5.1.5 OSC Manager

1. Directs repairs and corrective actions in coordination with the TSC.
2. Performs damage assessment.
3. Directs activities of Operations Support Center.
4. Coordinates maintenance teams and ensures they have received proper briefings and are accompanied by a Rad Protection technician, as necessary.

#### ~~B.5.1.6 TSC Clerks~~

- ~~1. Answer telephones.~~
- ~~2. Distribute plant parameter data sheets.~~
- ~~3. Maintain TSC organization board.~~
- ~~4. Operate facsimile machine.~~
- ~~5. Other duties as assigned by Site Emergency Director.~~

#### B.5.1.67 Nuclear Security Manager

1. Directs activities of Nuclear Security Services personnel.
2. Controls access to site and control rooms.
3. Reports on site accountability/evacuation as defined in SQN-EIPs.

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	<b>NP-REP APPENDIX B Page B-168 Revision <del>XXX</del></b>
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~~B.5.1.12 Emergency Preparedness Manager~~

- ~~1. Advises Site Emergency Director regarding overall radiological emergency plan, use of implementing procedures, emergency equipment availability, and coordination with CECC.~~
- ~~2. Confirms TSC is operating properly.~~

B.5.1.1~~12~~<sup>13</sup> Technical Assessment Team

1. Prepares and provides periodic current assessments on plant conditions and provides this information to the CECC plant assessment team.
2. Projects future plant status based on present plant conditions.
3. Provides technical support to plant operations on mitigating actions.

B.5.1.1~~13~~<sup>24</sup> OSC Assistant Manager

1. Oversees the operations of OSC teams.
2. Maintain continuous communications with the TSC.
3. Maintains team tracking boards.
4. Assigns TSC tasks to team briefers.

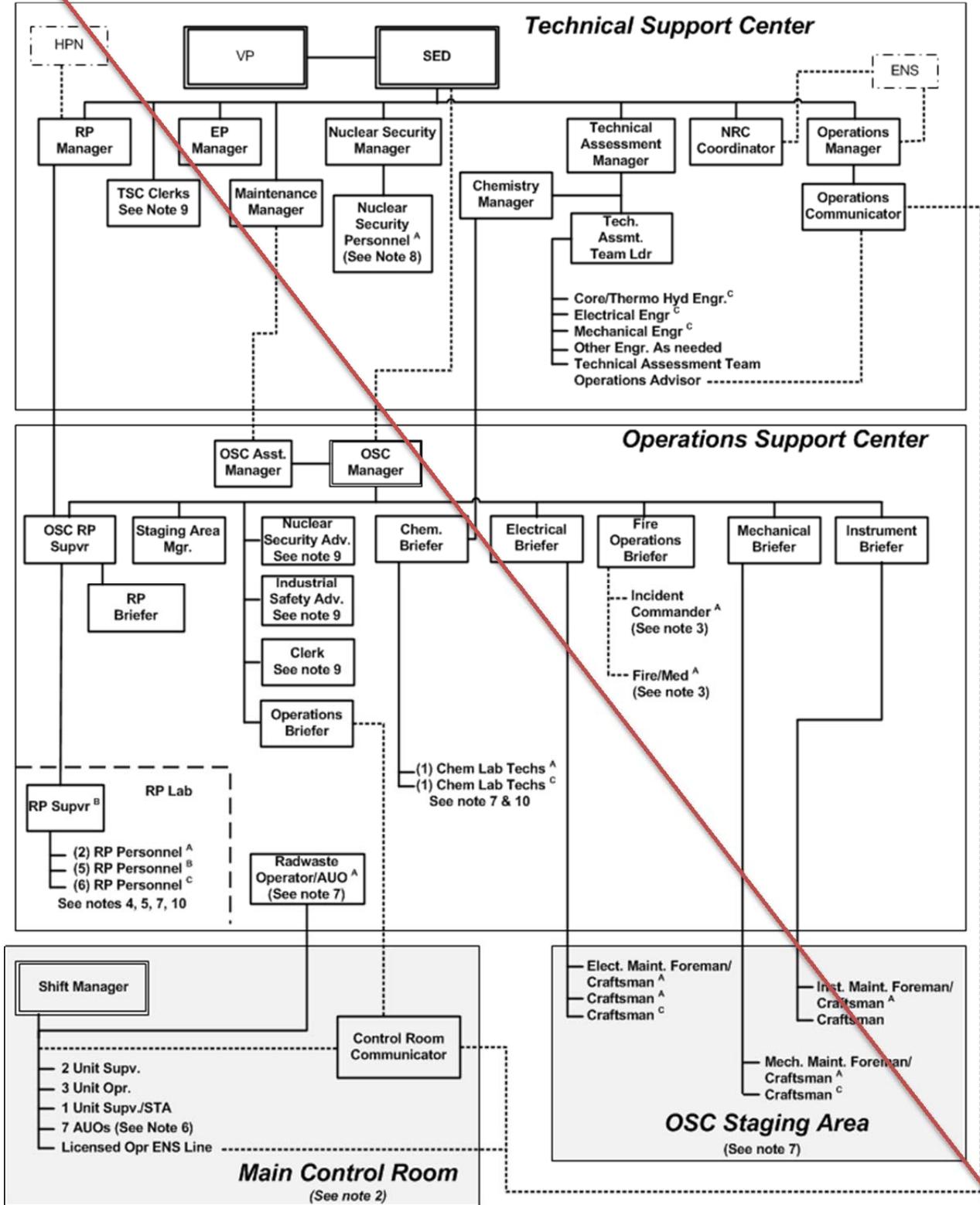
B.5.1.1~~24~~<sup>35</sup> OSC Rad Protection Supervisor

1. Directs activities of the Rad Protection lab.
2. Ensure Rad Protection coverage of damage repair teams.
3. Verify habitability of the TSC, OSC, and Control Room.
4. Briefs the OSC Manager and TSC on radiological status.

B.5.1.1~~35~~<sup>46</sup> Briefing Teams

1. Provide mechanical, electrical, and instrumentation technical expertise.
2. Evaluate task conditions and provide methods best suited to safely perform an assignment.
3. Brief OSC teams.
4. Track OSC teams in the field.
5. Debrief OSC teams after task completion.

**Figure B-1  
SITE EMERGENCY ORGANIZATION  
(Including Minimum Staffing and Augmentation) (See Note 1)**



<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	<b>NP-REP APPENDIX B Page B-179 Revision <del>XXX</del></b>
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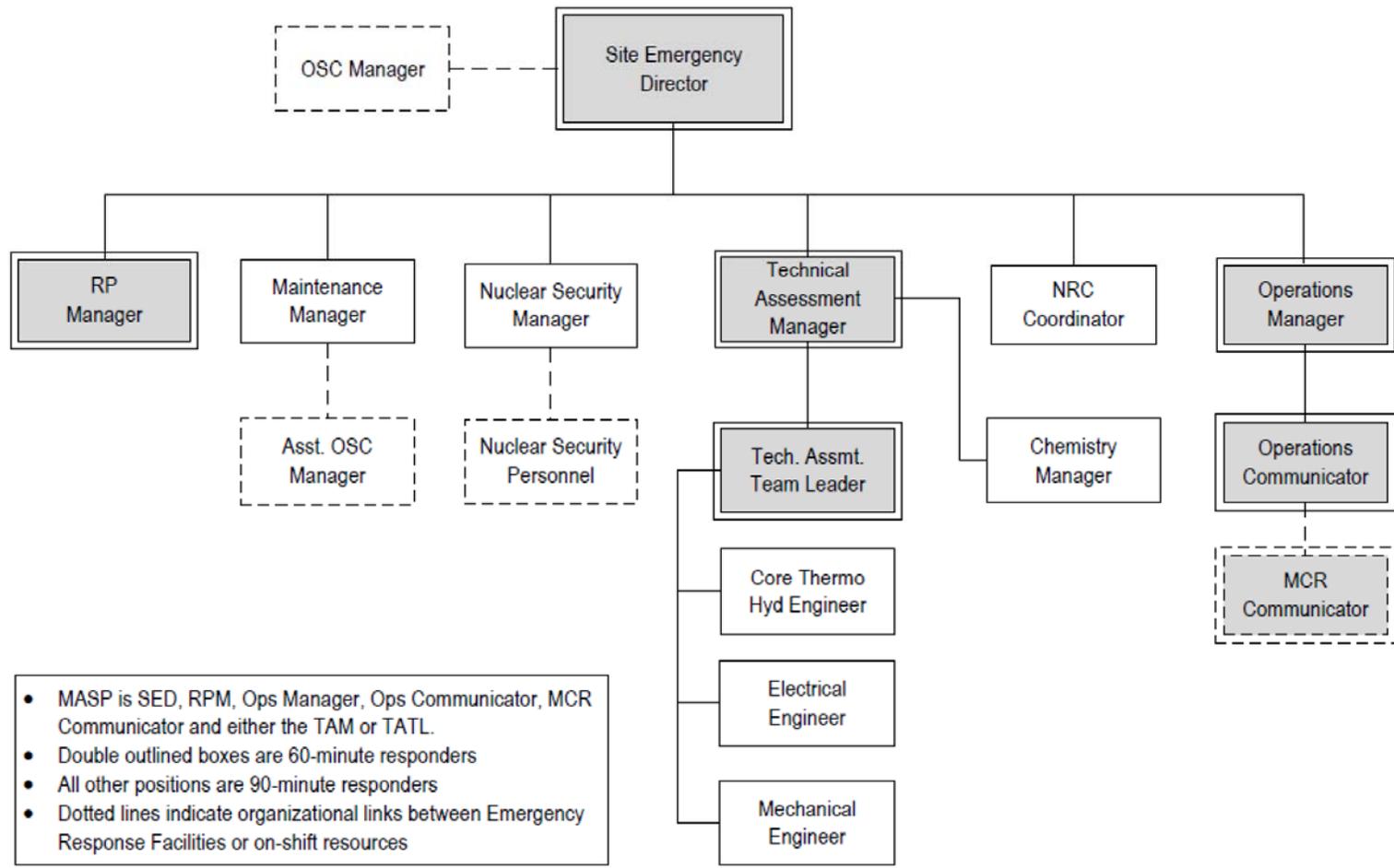
Figure B-1 (Continued)

Notes

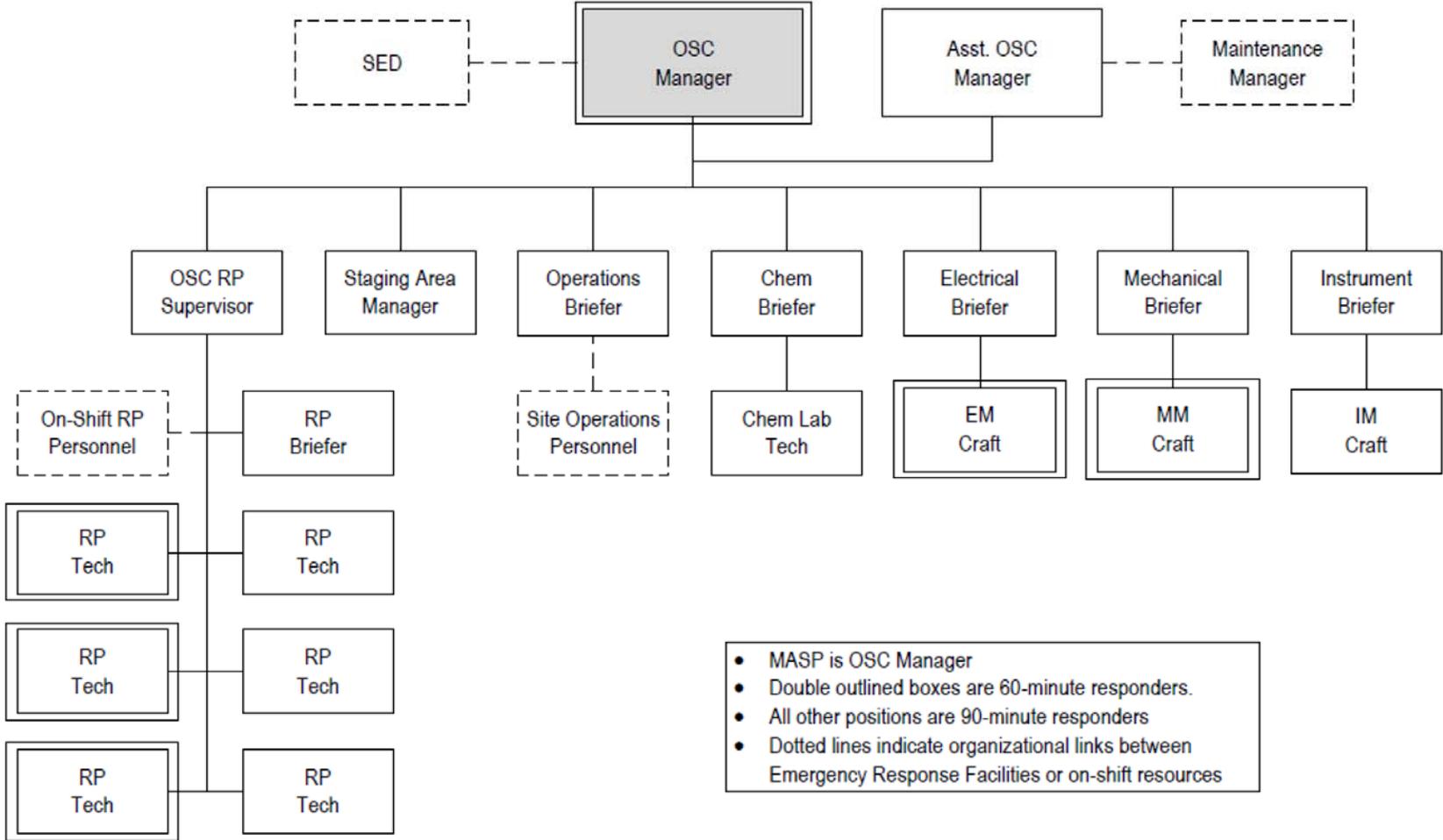
- Note 1- ERO members shown report to assigned facilities within approximately 60 minutes except as provided in these notes and the following which is used for clarification in NUREG 0654 Table B-1;
- A. on-shift
  - B. 30 minutes
  - C. 60 minutes
- Note 2- Main Control Room on-shift staffing (assuming both units in mode 4 or above) except the Control Room Communicator who is a 60 minute ERO member of the TSC and as provided in the following:
- As allowed by 10CFR50.54(m) Table (2)(i), 2 SROs and 3 Licensed Operators are required as a minimum for two unit plant with a common control room. Temporary deviations shall be in accordance with Tech Specs.
- Additionally, Table B-1 requires that each unaffected nuclear unit in operation maintain at least 1 Unit Supervisor, Unit Operator, and 1 AUO except units sharing a control room may share a Unit Supervisor if all functions are covered. 1 Licensed Operator has been added to the above requirements in order to address communications.
- Note 3- Fire Brigade personnel on-shift will be in accordance with the Fire Protection Report. This group also provides medical and rescue functions.
- Note 4- Offsite Dose Assessment task as shown in NUREG 0654 Table B-1 is provided by a qualified Radiation Protection individual.
- Note 5- Two Radiation Protection Technicians are required on-shift per NUREG 0654 Table B-1. One is required for in-plant surveys, the other may be provided by shift personnel assigned other functions. Six additional techs are required in 30 minutes and six more in 60 minutes. The Radiation Protection Supervisor may fill one of the six 30 minute responder positions.
- Note 6- Depicts reporting to the Shift Manager of non-control room on-shift personnel prior to staffing of the OSC at which time they report to the Staging Area.
- Note 7- Personnel at 30 minutes and/or 60 minutes may be on shift.
- Note 8- On-shift security personnel per the Security Plan.
- Note 9- Call in as needed
- Note 10- Chemistry Supervisor/Radiation Protection Supervisor, if holding proper qualifications, may fill the position of technician.

..... **Shows communication networks.**

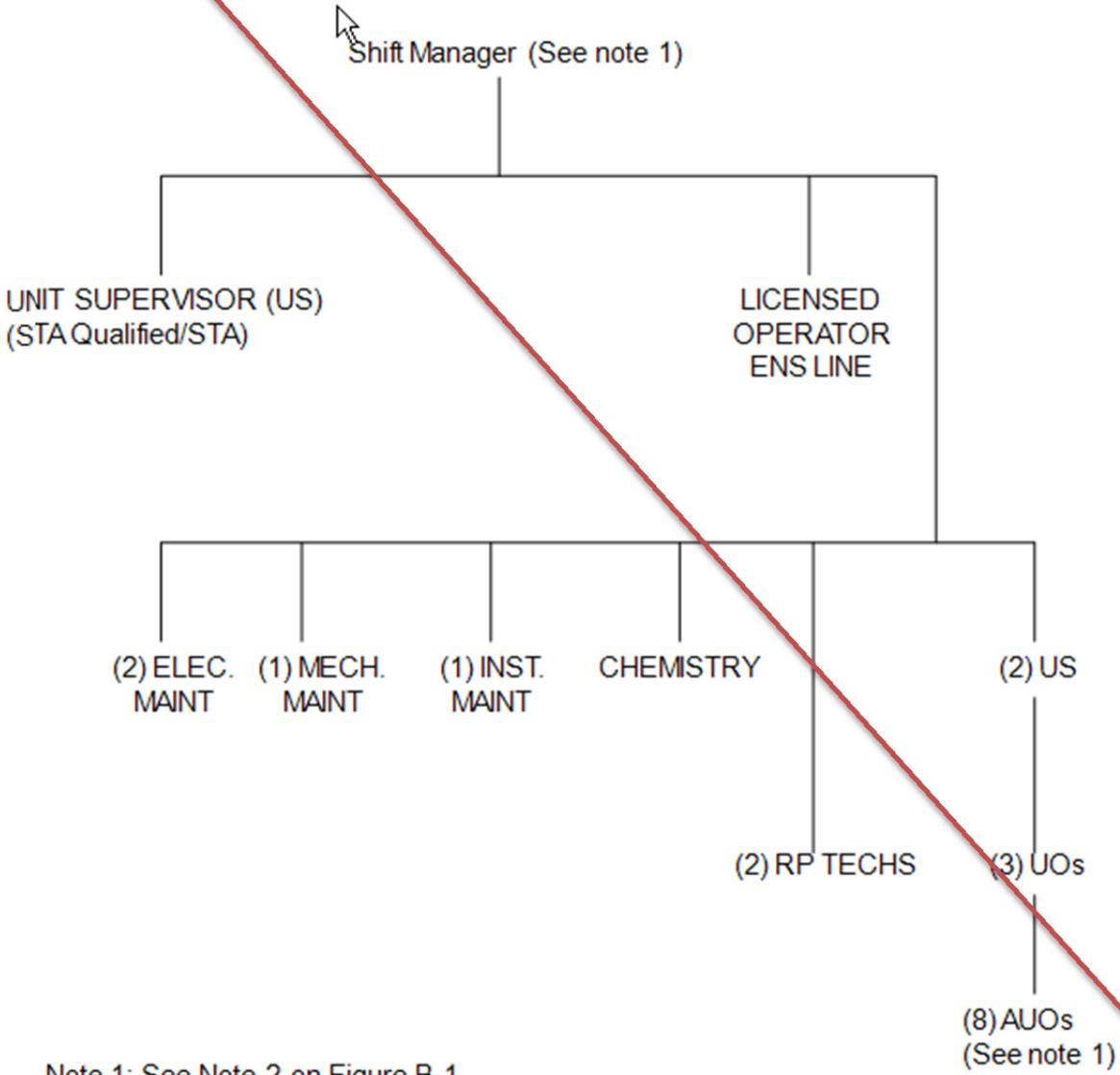
**Figure B-1**  
**TSC EMERGENCY ORGANIZATION**  
**(Including Minimum Staffing and Augmentation)**



**Figure B-1 (continued)**  
**OSC EMERGENCY ORGANIZATION**  
**(Including Minimum Staffing and Augmentation)**



**FIGURE B-2  
MINIMUM ONSHIFT RESPONSE PERSONNEL**



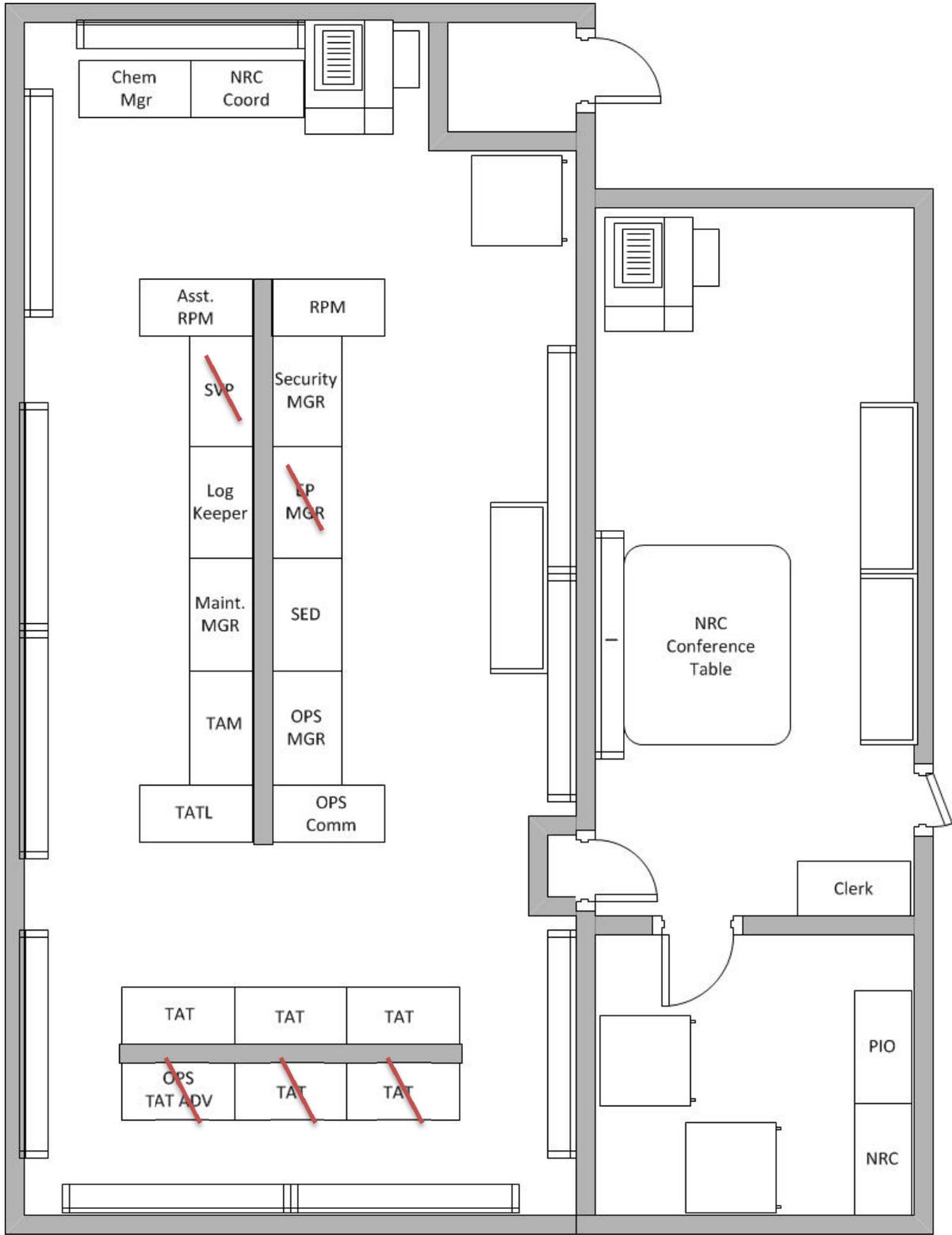
**Figure B-2  
MINIMUM ONSHIFT RESPONSE PERSONNEL**

<u>Major Functional Area</u>	<u>Major Tasks</u>	<u>Position Title or Expertise</u>	<u>On-Shift</u>	<u>Augmented Response</u>		
				<u>60 min</u>	<u>90 min</u>	
<u>Plant Operations and Shift Supervisor (SRO): Assessment of Control Room Reactor Operational Aspects</u>		<u>Shift Manager/ED (SRO)</u>	<u>1</u>	-	-	
		<u>Unit Supervisors (SRO)</u>	<u>2</u>	-	-	
		<u>Unit Operators (UO)</u>	<u>3</u>	-	-	
		<u>Auxiliary Unit Operators (AUO)</u>	<u>8</u>	-	-	
<u>Notification/ Communication</u>	<u>Notify State, local and Federal personnel &amp; maintain communication</u>	<u>Emergency Communicator (Shift)</u>	<u>1</u>	-	-	
		<u>MCR Communicator (CR)</u>	-	<u>1</u>	-	
		<u>Ops Manager (TSC)</u>	-	<u>1</u>	-	
		<u>Ops Communicator (TSC)</u>	-	<u>1</u>	-	
		<u>State Communicator (CECC)</u>	-	<u>1</u>	-	
<u>Radiological Accident Assessment and Support of Operational Accident Assessment</u>	<u>Emergency Operations Facility Director</u>	<u>SED (TSC)</u>	-	<u>1</u>	-	
		<u>CECC Director</u>	-	<u>1</u>	-	
		<u>Plant Assmt Manager (CECC)</u>	-	<u>1</u>	-	
	<u>Offsite Dose Assessment</u>		<u>Chemistry Technician (Shift)</u>	<u>1**</u>	-	-
			<u>RP Manager (TSC)</u>	-	<u>1</u>	-
			<u>RAM/RAC (CECC)</u>	-	<u>1</u>	-
			<u>Dose Assessor (CECC)</u>	-	<u>1</u>	-
	<u>Offsite Surveys</u>		<u>RP Tech/Support</u>	-	<u>2</u>	<u>2</u>
			<u>Onsite Surveys (out-of-plant) and In-Plant Surveys</u>	<u>1</u>	<u>1</u>	<u>1</u>
	<u>Plant System Engineering</u>	<u>Chemistry/Radio Chemistry Technical Support</u>	<u>Chemistry Technician</u>	<u>1</u>	-	<u>1</u>
<u>Shift Technical Advisor (SRO)</u>			<u>1</u>	-	-	
<u>Tech Assmt Manager (TSC)</u>			-	<u>1</u>	-	
<u>Tech Assmt Team Lead (TSC)</u>			-	<u>1</u>	-	

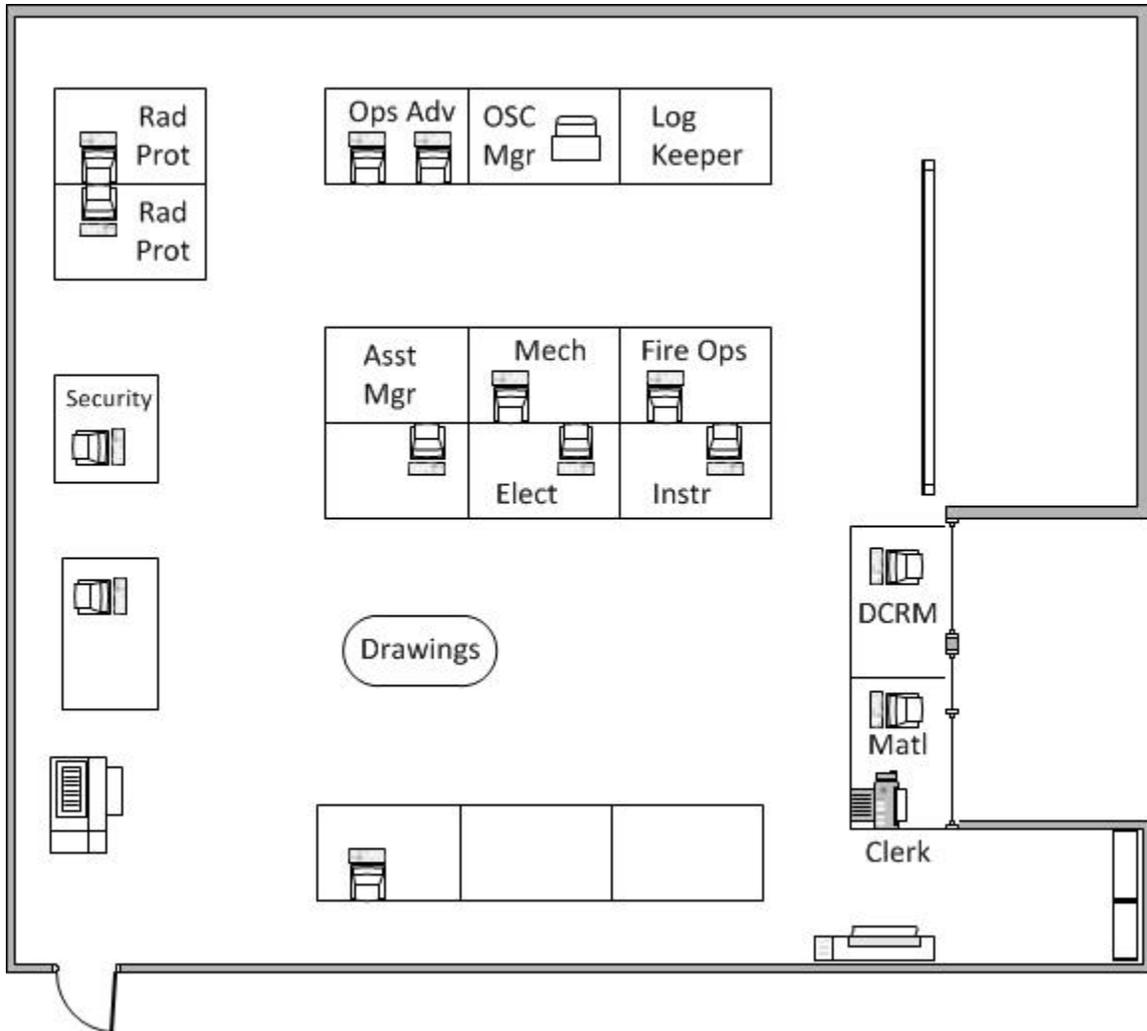
<u>Major Functional Area</u>	<u>Major Tasks</u>	<u>Position Title or Expertise</u>	<u>On-Shift</u>	<u>Augmented Response</u>	
				<u>60 min</u>	<u>90 min</u>
<u>Plant System Engineering (continued)</u>	<u>Technical Support (continued)</u>	<u>Core/Thermal Engineer</u>	-	-	<u>1</u>
		<u>Electrical Engineer</u>	-	-	<u>1</u>
		<u>Mechanical Engineer</u>	-	-	<u>1</u>
<u>Repair and Corrective Actions</u>	<u>Repairs and Corrective Actions</u>	<u>Mechanical Maintenance</u>	-	<u>1</u>	-
		<u>Electrical Maintenance</u>	-	<u>1</u>	-
		<u>Instrument Control</u>	-	-	<u>1</u>
		<u>OSC Manager</u>	-	<u>1</u>	-
<u>Protective Actions (In-Plant)</u>	<u>Radiation Protection:</u> <u>a. Access Control</u> <u>b. HP Coverage for repair, corrective actions, search and rescue, first-aid &amp; firefighting</u> <u>c. Personnel monitoring</u> <u>d. Dosimetry</u>	<u>RP Tech</u>	<u>1</u>	<u>1</u>	<u>1</u>
<u>Fire Fighting</u>		<u>Fire Brigade</u>	<u>5</u>	<u>Local Support</u>	<u>Local Support</u>
<u>Rescue Operations and First Aid</u>		<u>Incident Commander (SRO)</u>	<u>1</u>		
		<u>Other Site personnel</u>	<u>2**</u>	<u>Local Support</u>	<u>Local Support</u>
<u>Site Access Control And Personnel Accountability</u>	<u>Security, firefighting communications, personnel accountability</u>	<u>Security Personnel</u>	<u>Per Security Plan</u>	<u>Per Security Plan</u>	<u>Per Security Plan</u>
		<b><u>TOTAL</u></b>	<b><u>25</u></b>	<b><u>19</u></b>	<b><u>10</u></b>

\*\* May be provided by shift personnel assigned other functions

**Figure B-3  
TECHNICAL SUPPORT CENTER (SAMPLE)  
Control Building Elevation 732'**



**FIGURE B-4  
OPERATIONS SUPPORT CENTER (SAMPLE)  
Plant Office Building Elevation 706**



**Attachment 2**

**Proposed Emergency Plan Sections (Retyped)**

**Sub-Attachments:**

**2-A) Proposed TVA Radiological Emergency Plan (REP) (Generic Part) (Retyped)**

**2-B) Proposed TVA REP Appendix B, Sequoyah Nuclear Plant (Retyped)**

**Sub-Attachment 2-A**

**Proposed TVA Radiological Emergency Plan (REP) (Generic Part) (Retyped)**

**(6 Pages Follow)**



**Radiological  
Emergency  
Procedure**

**RADIOLOGICAL EMERGENCY PLAN  
(GENERIC PART)**

**REP-Generic  
Rev. XXX  
Page 1 of 91**

Quality Related       Yes       No

Effective Date \_\_\_\_\_

Level of Use: Information Use

Prepared by: Josh Perrel

Reviewed by: \_\_\_\_\_  
Program Manager, EP Special Projects      Date

Concurred by: \_\_\_\_\_  
EP Manager (BFN)      Date

Concurred by: \_\_\_\_\_  
BFN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
EP Manager (SQN)      Date

Concurred by: \_\_\_\_\_  
SQN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
EP Manager (WBN)      Date

Concurred by: \_\_\_\_\_  
WBN PORC Chairman      Date

Concurred by: \_\_\_\_\_  
Director, Emergency Preparedness      Date

Approved by: \_\_\_\_\_  
GM, Support Services      Date

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 18 of 91</b>
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### 3.2 Onsite Organization (continued)

3. This time could vary slightly, depending upon the time of day, weather conditions, immediate availability of personnel, and radiological conditions.
- E. The site emergency organization augments the shift operations crew.
1. If members of the site emergency organization are not present when an emergency occurs, the Shift Manager on duty, or a designated Unit Supervisor when acting as the Shift Manager, is designated the Site Emergency Director and acts for him until relieved by the Plant Manager or his alternate.
- F. Upon detection of a known or suspected emergency, the Shift Manager on duty refers to the site-EPIP-1 to determine the classification of the emergency.
1. After determining the classification of the incident, the Shift Manager assumes the responsibilities of Site Emergency Director and initiates the appropriate procedure referenced by site-EPIP-1.
  2. Staffing instructions for the site emergency support centers are specified in the site-EPIPs.
- G. Site procedures shall designate site personnel who shall staff the ENS and HPN (NRC FTS 2000 System) Communication Systems.
1. Site procedures shall designate the interface during TSC operation.
- H. Each site will at a minimum establish the following positions within its emergency response organization with corresponding responsibilities as outlined below. The site-specific appendix gives detailed staffing and organizational data, including additional positions deemed necessary by the site.

#### 3.2.2 Site Vice President (Watts Bar and Browns Ferry Only)

- A. The Site Vice President serves as a corporate interface for the SED, relieving him from duties which could distract from the SED's primary purpose of plant operations and accident mitigation activities. The Site Vice President provides assistance to the SED by providing TVA policy direction; directing site resources to support the SED in accident mitigation activities; and providing a direct interface on overall site response activities with NRC, DHS, or other Federal organizations responding to the site, CECC Director, or onsite media.
- B. At his discretion, he may provide an interface at the appropriate offsite location on the overall site response activities with State and local agencies, NRC region/corporate, or Joint Information Center. He also provides support to other emergency operation centers as necessary.

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 29 of 91</b>
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#### 4.1.3 Alert (continued)

- B. The purposes of the Alert class are:
1. To ensure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring, if required; and
  2. To provide offsite authorities current status information.
  3. To ensure that monitoring teams are dispatched (Sequoyah only).
- C. The Alert class is maintained until event termination or escalation to a higher class. The State authorities are notified and in turn notify the local authorities. Following closeout, State authorities are briefed and no later than the next working day a written summary of significant events which occurred is forwarded to the State.

#### 4.1.4 Site Area Emergency

- A. A Site Area Emergency is declared when events are in process or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or Hostile Action that results 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 Protective Action Guideline exposure levels beyond the site boundary.
- B. The purposes of the Site Area Emergency class are:
1. To ensure that response centers are staffed.
  2. To assure that monitoring teams are dispatched.
  3. To assure that personnel required for evacuation of nearsite areas are at duty stations if the situation becomes more serious.
  4. To provide current information for, and consultation with, offsite authorities and the public.
- C. The Site Area Emergency class is maintained until event termination or escalation to a higher class. The State authorities are notified and in turn notify the local authorities. Following closeout, State authorities are briefed and no later than the next working day a written summary of significant events which occurred is forwarded to the State.

#### 4.1.5 General Emergency

- A. A General Emergency is declared when events are in process or have occurred which 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 Protective Action Guideline exposure levels offsite for more that the immediate site area.
- B. The purposes of the General Emergency class are:

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 33 of 91</b>
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**5.1 Onsite**

Upon detection of a known or suspected emergency, the Shift Manager on duty will utilize the site-EPIP-1 to determine the classification of the emergency. After determining the classification of the emergency, the SED will initiate the appropriate procedures referenced by the site-EPIP-1. Each procedure referenced by site-EPIP-1 gives specific instructions on staffing the TSC and OSC and for notifying the State, ODS, and NRC.

**5.2 Offsite**

Implementing procedures are provided to activate TVA and State emergency staffs. Essential emergency positions are covered on a 24-hour-a-day basis by duty personnel. Emergency centers are located to ensure rapid and effective response of personnel needed to assess and evaluate offsite conditions.

**5.2.1 Notification of Unusual Event (NOUE)**

Upon declaration of this class, the following actions are performed:

- A. The MCR notifies and relays the information to the State within 15 minutes of declaration of the event.
- B. The ODS in Chattanooga is notified of the event by the MCR and records the details of the event in accordance with the appropriate EPIP.
- C. The ODS notifies and relays the information to the EDO and CECC Director.
- D. The EDO keeps the CECC Director and the Public Information Manager informed of the situation as necessary.
- E. The PIM notifies the Site Communications Consultant; Director, Public Relations & Corporate Information; and TVA News Bureau (Knoxville).
- F. The SED augments plant shift personnel as necessary to initiate corrective or protective actions.

**5.2.2 Alert**

Upon declaration of this class, the following minimum actions are performed:

- A. Notifications described in Section 5.2.1 are performed.
- B. The CECC is staffed.
- C. Environmental sampling teams are dispatched for Sequoyah and may be dispatched at this classification level for Browns Ferry and Watts Bar.
- D. The TSC and the OSC are activated.
- E. The situation is analyzed and any appropriate corrective or preventive actions initiated.
- F. Hourly, or more often as necessary, the State agencies are updated through the CECC on appropriate plant status and environmental conditions as follows:

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 49 of 91</b>
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### 9.2.1 General Information (continued)

This procedure is designed to direct the activities of the Meteorologist during a radiological emergency to provide a timely response, consistent and accurate meteorological information, and atmospheric transport and dispersion advice.

R. CECC-EPIP-18-TRANSPORTATION AND STAFFING UNDER ABNORMAL CONDITIONS

This procedure provides instructions for the transportation of TVA employees under certain limited circumstances. It also includes instructions for lodging and meals as necessary under those circumstances.

S. CECC-EPIP-19- POST ACCIDENT FUEL DAMAGE ASSESSMENT

This procedure provides a method to assess the degree of reactor core damage from measured fission product concentrations and interpretations of other plant parametric data under accident conditions. The procedure also provides guidance in obtaining necessary information to predict radionuclide releases (source term) from TVA nuclear plants during accident conditions.

T. CECC-EPIP-20- NOT ACTIVE AT THIS TIME

U. CECC-EPIP-21- EMERGENCY DUTY OFFICER PROCEDURE FOR NOTIFICATION OF UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, AND GENERAL EMERGENCY

This procedure is designed to direct the EDO in notifying key TVA organizations and contacts in the event of a Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency.

V. CECC-EPIP-22- OPERATIONS DUTY SPECIALIST TRANSPORTATION INCIDENTS INVOLVING A SHIPMENT OF RADIOACTIVE MATERIAL

This procedure directs the ODS in obtaining information concerning a transportation accident involving radioactive material.

W. CECC-EPIP-23- RADIOACTIVE MATERIAL TRANSPORTATION INCIDENTS

The objective of this procedure is to provide guidance and instructions to emergency personnel concerning transportation accidents involving radioactive materials.

### 9.2.2 Sampling Team

TVA has vans equipped to monitor the environment for radioactivity. Each site van has an air sampler, radiation measurement equipment, a generator, radio, and other assorted equipment. A detailed listing of the minimum required equipment is available in the CECC-EPIPs.

- A. These vehicles are dispatched for environmental monitoring for Site Area Emergency and General Emergency classifications for Browns Ferry and Watts Bar and at the Alert or higher classification for Sequoyah.

<b>Radiological Emergency Procedure</b>	<b>RADIOLOGICAL EMERGENCY PLAN (GENERIC PART)</b>	<b>REP-Generic Rev. XXX Page 50 of 91</b>
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### 9.2.2 Sampling Team (continued)

- B. They may be deployed for lower classifications, if warranted.
- C. Van(s) are stationed at each site.
- D. Each team has the capability to:
  1. Obtain environmental samples for analysis.
  2. Make direct radiation readings.
  3. Collect air samples and analyze them for gross beta-gamma radioactivity over a range of energies.
  4. Collect air samples and analyze them for radioiodine in the field, to concentrations as low as  $10^{-7}$  microcuries/cc.
- E. Within 30 minutes (60 minutes for SQN) of the applicable emergency declaration, one sampling team can be deployed from the plant for environmental assessment. Additional teams can be dispatched from other facilities. At least one additional team can be deployed within approximately one hour (90 minutes for SQN) of notification. Composition and activation of sampling teams are described in the EIPs.
- F. For the Site Area Emergency, and General Emergency classifications, teams are dispatched from the nearest location.
- G. They may be deployed for the Notification of Unusual Event or Alert, as noted in 9.2.2.B, if warranted. If necessary, teams can be transported in a helicopter or fixed-wing aircraft.
- H. The TSC Rad Protection Manager or CECC Environs Assessor can request assistance from a neighboring plant for environmental monitoring, if deemed necessary.
- I. TVA has aquatic monitoring teams located at Chattanooga, Tennessee and Athens, Alabama. These teams have boats that can be deployed to obtain samples from the river for subsequent analysis for radioactivity in the laboratories.
- J. State agencies have the responsibility to coordinate and evaluate offsite assessment actions. All environmental monitoring activities will be coordinated through the RMCC. State environmental monitoring capabilities and the RMCC operations are referenced in Appendix E. TVA will be co-located in the RMCC and coordination of TVA and State monitoring teams will be conducted from that point. Environmental monitoring data will be shared between the State and TVA.
- K. Additional environmental monitoring assistance can be obtained by contacting the DOE offices at Oak Ridge, Tennessee or Aiken, South Carolina. The EPA in Montgomery, Alabama can also provide assistance. Environmental monitoring teams and mobile radioanalytical laboratories can be supplied. The State agencies usually request and coordinate these services.

**Sub-Attachment 2-B**

**Proposed TVA REP Appendix B, Sequoyah Nuclear Plant (Retyped)**

**(11 Pages Follow)**

**SQN**

**TENNESSEE VALLEY AUTHORITY  
NUCLEAR POWER  
RADIOLOGICAL EMERGENCY PLAN**

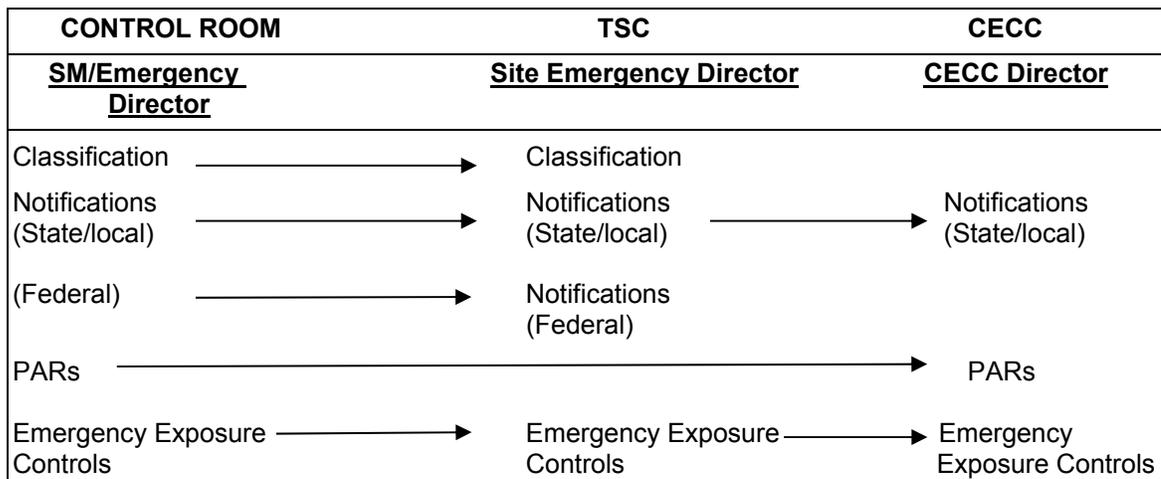
**NP-REP  
APPENDIX B  
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Revision XXX**

**APPENDIX B**

**SEQUOYAH  
NUCLEAR PLANT**

## B.5 SITE EMERGENCY ORGANIZATION

SQN maintains an organization capable of responding to a radiological emergency. The TSC and OSC staffing for response to emergencies is shown on Figure B-1. Figure B-1 also identifies minimum staff positions required to activate the TSC and OSC. Facility activation will be completed within 60 minutes of an Alert or higher classification. The minimum on shift emergency response staffing is shown in Figure B-2. The Command and Control transfer process is outlined in the diagram below.



**Transition of Command and Control Functions**

### B.5.1 Emergency Response Positions

TSC and OSC emergency response positions are described in SQN EPIP-6, "Activation and Operation of the Technical Support Center" and SQN EPIP-7, "Activation and Operation of the Operations Support Center."

#### B.5.1.1 Site Emergency Director

1. Directs onsite emergency accident mitigation activities.
2. Consults with CECC Director on significant events and their related impacts.
3. Initiates onsite protective actions.
4. Coordinates accident mitigation actions with NRC.
5. Initiates long-term 24-hour accident mitigation operations.
6. Prior to the CECC being activated, makes recommendations for protective actions (if necessary) to State and local agencies through the Operations Duty Specialist. This responsibility cannot be delegated except to the CECC Director after the CECC is activated.

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	<b>NP-REP APPENDIX B Page B-165 Revision XXX</b>
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7. Responsible for determining the emergency classification. This responsibility cannot be delegated.
8. Approves or authorizes emergency doses. This responsibility cannot be delegated.

B.5.1.2 Operations Manager

1. Directs operational activities.
2. Accepts responsibility for Federal Notification function from the control room.
3. Recommends solutions and mitigating action for operational problems.

B.5.1.3 Operations Communicator

1. Informs the Operations Manager of plant status and operational problems.
2. Assures the control room is aware of the accident assessment and response.
3. Provides support for performance of Federal Notification function.

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	<b>NP-REP APPENDIX B Page B-166 Revision XXX</b>
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#### B.5.1.4 Technical Assessment Manager

1. Directs onsite effluent assessment.
2. Directs activities of technical assessment team.
3. Projects future plant status based on present plant conditions.
4. Keeps assessment team informed of plant status.
5. Provides information, evaluations, and projects to Site Emergency Director.
6. Coordinates assessment activities with the CECC plant assessment team.
7. Establishes and maintains a status of significant plant problems.

#### B.5.1.5 OSC Manager

1. Directs repairs and corrective actions in coordination with the TSC.
2. Performs damage assessment.
3. Directs activities of Operations Support Center.
4. Coordinates maintenance teams and ensures they have received proper briefings and are accompanied by a Rad Protection technician, as necessary.

#### B.5.1.6 Nuclear Security Manager

1. Directs activities of Nuclear Security Services personnel.
2. Controls access to site and control rooms.
3. Reports on site accountability/evacuation as defined in SQN-EIPs.

<b>SQN</b>	<b>TENNESSEE VALLEY AUTHORITY NUCLEAR POWER RADIOLOGICAL EMERGENCY PLAN</b>	<b>NP-REP APPENDIX B Page B-168 Revision XXX</b>
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B.5.1.11 Technical Assessment Team

1. Prepares and provides periodic current assessments on plant conditions and provides this information to the CECC plant assessment team.
2. Projects future plant status based on present plant conditions.
3. Provides technical support to plant operations on mitigating actions.

B.5.1.12 OSC Assistant Manager

1. Oversees the operations of OSC teams.
2. Maintain continuous communications with the TSC.
3. Maintains team tracking boards.
4. Assigns TSC tasks to team briefers.

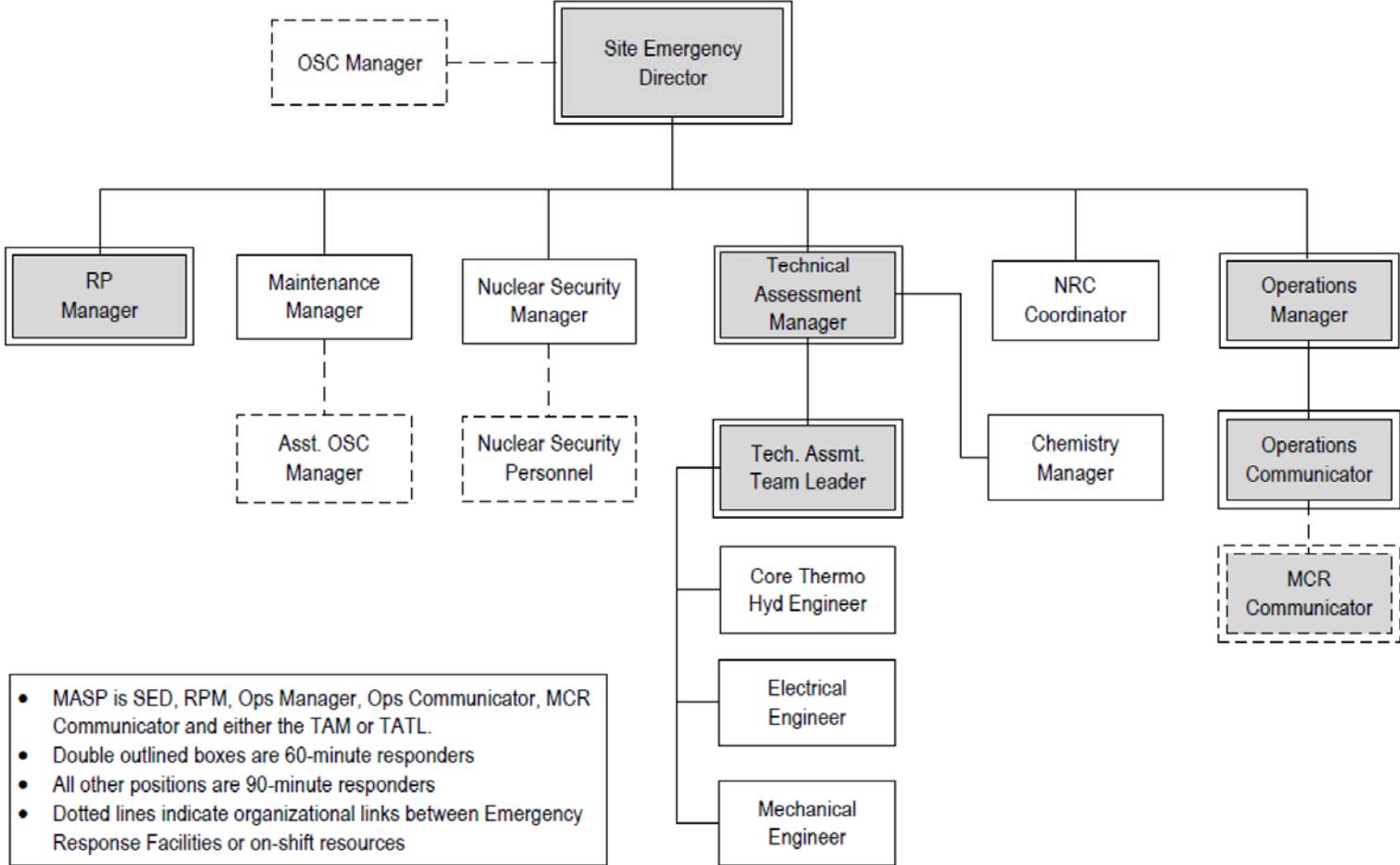
B.5.1.13 OSC Rad Protection Supervisor

1. Directs activities of the Rad Protection lab.
2. Ensure Rad Protection coverage of damage repair teams.
3. Verify habitability of the TSC, OSC, and Control Room.
4. Briefs the OSC Manager and TSC on radiological status.

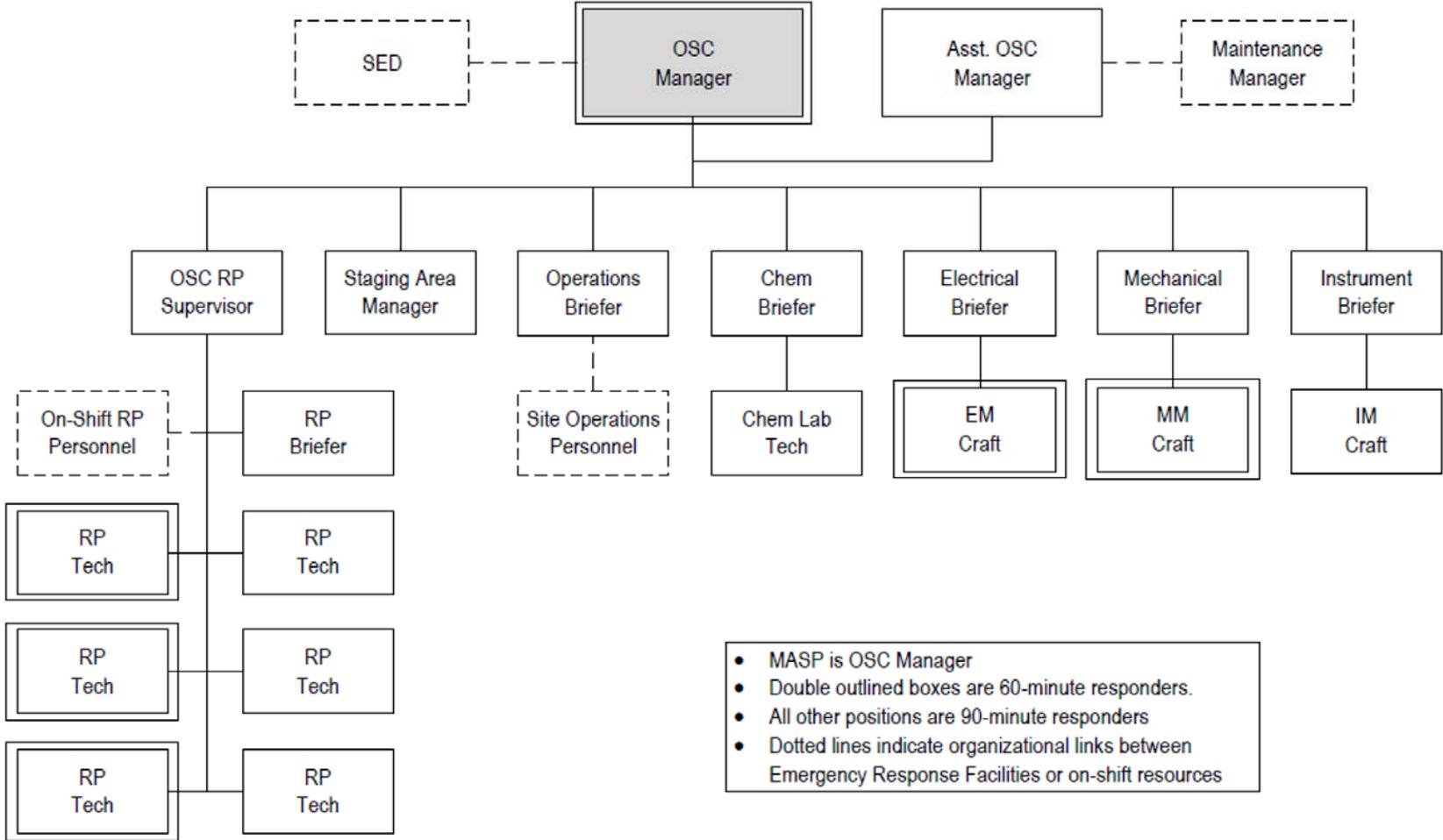
B.5.1.14 Briefing Teams

1. Provide mechanical, electrical, and instrumentation technical expertise.
2. Evaluate task conditions and provide methods best suited to safely perform an assignment.
3. Brief OSC teams.
4. Track OSC teams in the field.
5. Debrief OSC teams after task completion.

**Figure B-1  
TSC EMERGENCY ORGANIZATION  
(Including Minimum Staffing and Augmentation)**



**Figure B-1 (continued)  
OSC EMERGENCY ORGANIZATION  
(Including Minimum Staffing and Augmentation)**



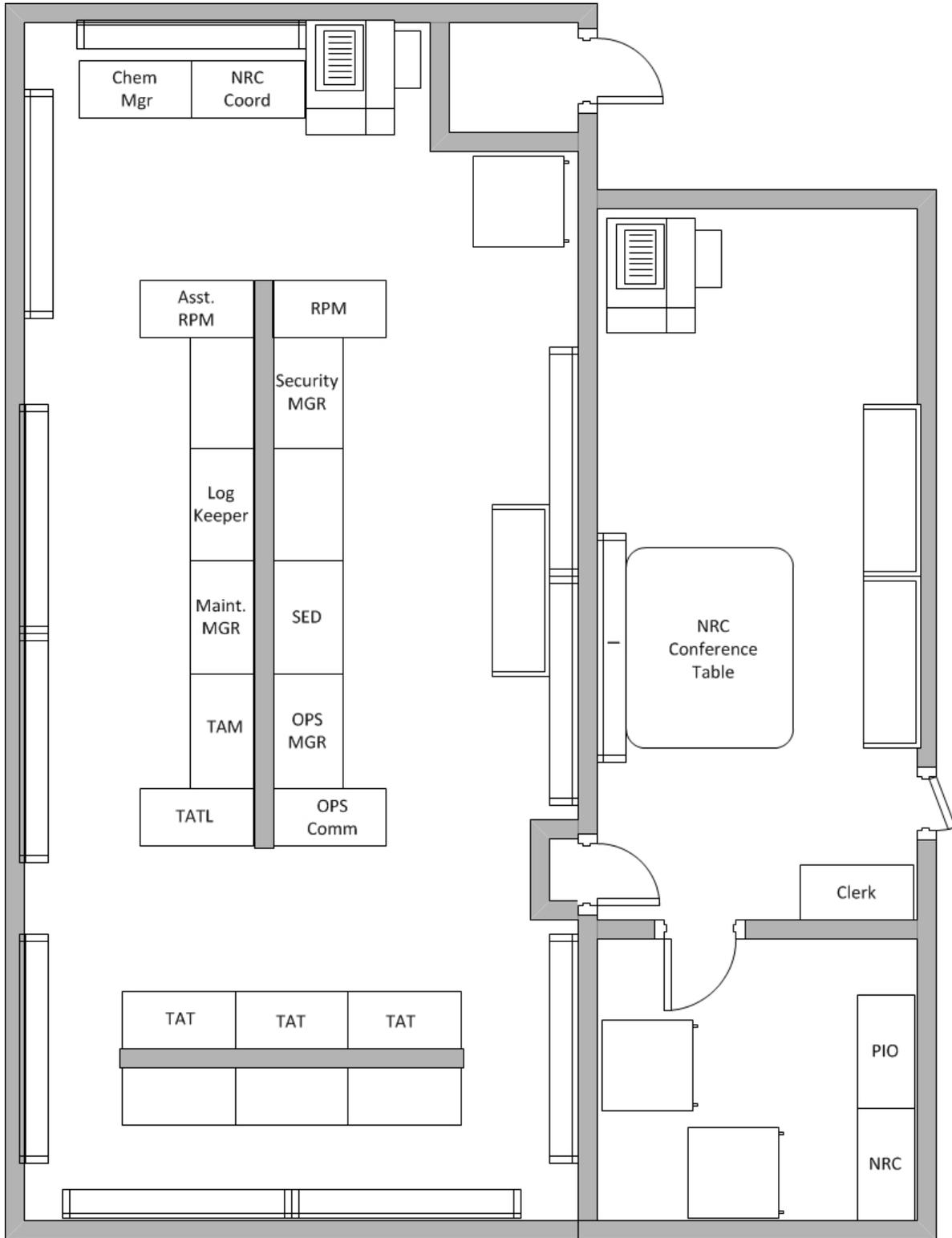
**Figure B-2  
MINIMUM ONSHIFT RESPONSE PERSONNEL**

Major Functional Area	Major Tasks	Position Title or Expertise	On-Shift	Augmented Response		
				60 min	90 min	
Plant Operations and Shift Supervisor (SRO): Assessment of Control Room Reactor Operational Aspects		Shift Manager/ED (SRO)	1	-	-	
		Unit Supervisors (SRO)	2	-	-	
		Unit Operators (UO)	3	-	-	
		Auxiliary Unit Operators (AUO)	8	-	-	
Notification/ Communication	Notify State, local and Federal personnel & maintain communication	Emergency Communicator (Shift)	1	-	-	
		MCR Communicator (CR)	-	1	-	
		Ops Manager (TSC)	-	1	-	
		Ops Communicator (TSC)	-	1	-	
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Operations Facility Director	State Communicator (CECC)	-	1	-	
		SED (TSC)	-	1	-	
		CECC Director	-	1	-	
	Offsite Dose Assessment		Plant Assmt Manager (CECC)	-	1	-
			Chemistry Technician (Shift)	1**	-	-
			RP Manager (TSC)	-	1	-
			RAM/RAC (CECC)	-	1	-
	Offsite Surveys		Dose Assessor (CECC)	-	1	-
			RP Tech/Support	-	2	2
			Onsite Surveys (out-of-plant) and In-Plant Surveys	1	1	1
Plant System Engineering	Chemistry/Radio Chemistry Technical Support	Chemistry Technician	1	-	1	
		Shift Technical Advisor (SRO)	1	-	-	
		Tech Assmt Manager (TSC)	-	1	-	
		Tech Assmt Team Lead (TSC)	-	1	-	

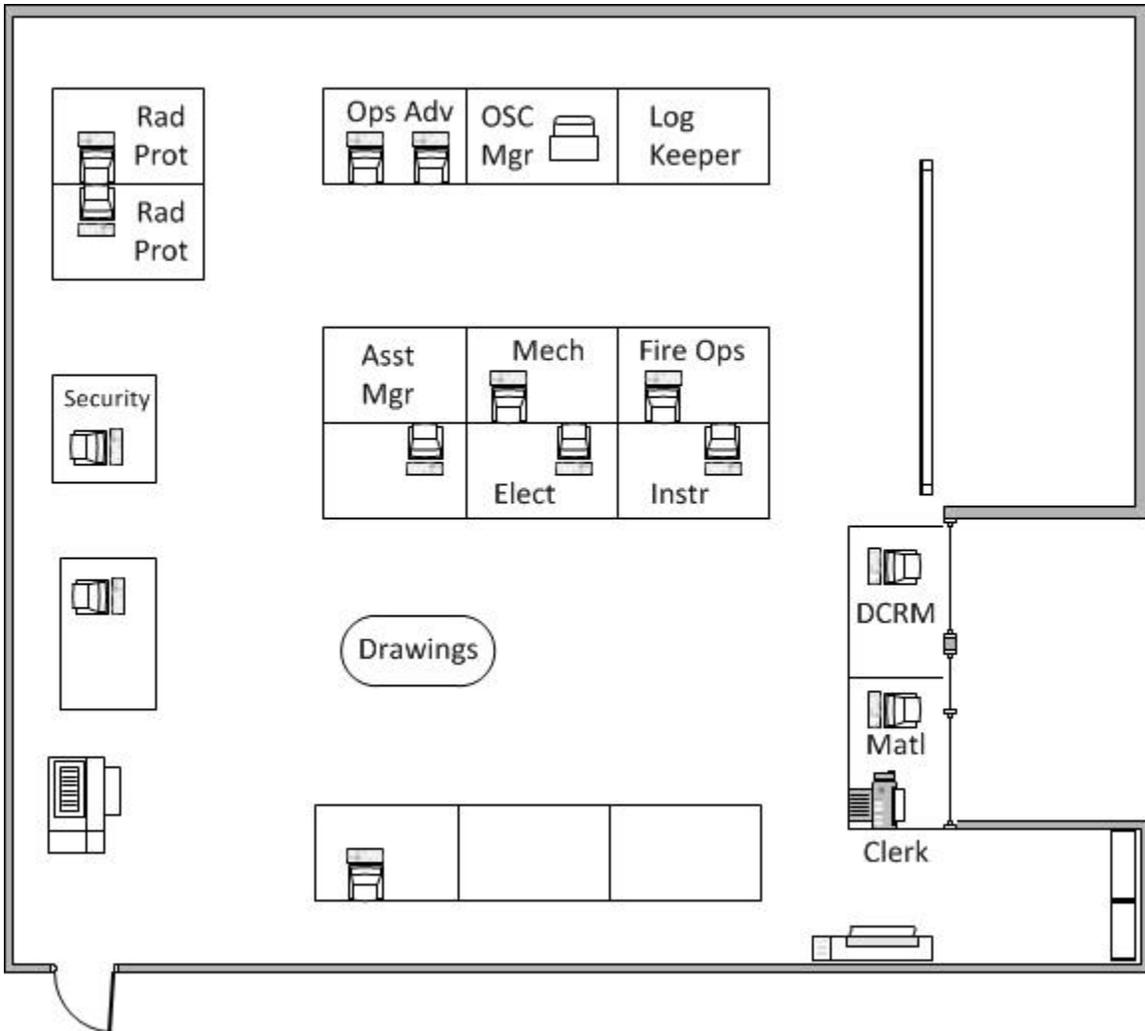
Major Functional Area	Major Tasks	Position Title or Expertise	On-Shift	Augmented Response	
				60 min	90 min
Plant System Engineering (continued)	Technical Support (continued)	Core/Thermal Engineer	-	-	1
		Electrical Engineer	-	-	1
		Mechanical Engineer	-	-	1
Repair and Corrective Actions	Repairs and Corrective Actions	Mechanical Maintenance	-	1	-
		Electrical Maintenance	-	1	-
		Instrument Control	-	-	1
		OSC Manager	-	1	-
Protective Actions (In-Plant)	Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue, first-aid & firefighting c. Personnel monitoring d. Dosimetry	RP Tech	1	1	1
Fire Fighting		Fire Brigade	5	Local Support	Local Support
Rescue Operations and First Aid		Incident Commander (SRO)	1		
		Other Site personnel	2**	Local Support	Local Support
Site Access Control And Personnel Accountability	Security, firefighting communications, personnel accountability	Security Personnel	Per Security Plan	Per Security Plan	Per Security Plan
<b>TOTAL</b>			<b>25</b>	<b>19</b>	<b>10</b>

\*\* May be provided by shift personnel assigned other functions

**Figure B-3  
TECHNICAL SUPPORT CENTER (SAMPLE)  
Control Building Elevation 732'**



**FIGURE B-4  
OPERATIONS SUPPORT CENTER (SAMPLE)  
Plant Office Building Elevation 706**



**Attachment 3**

**NUREG-0654 Table B-1 Comparative Chart**

**(3 Pages Follow)**

### SQN Site On-Shift Table Comparison

Major Functional Area	Major Tasks	Position Title / Expertise	Table B-1 on-shift	SQN Rev 0 1988	SQN Rev 105 current	SQN Proposed On-shift
Plant Operation and Assessment of Operation Aspects		Shift Supervisor (SRO)	1	1	1	1
		Shift Foreman (SRO)	1	2	2	2
		Control Room Operators	2	3	3	3
		Auxiliary Operators	2	2	8	8
Emergency Direction and Control (Emergency Coordinator) ***		STA. Shift Supervisor or facility manager	1**	1**	1**	1**
Notification / Communication ****	Notify State/local and federal personnel, maintain communication		1****	1****	1	1
Radiological Accident Assessment and Support of Operational Accident Assessment	In-Plant surveys	HP Technicians	1	1	1	1
	Chemistry / Radiochemistry	Chem Technicians	1	2	1	1
Plant System Engineering	Technical support	Shift Technical Advisor	1	1	1	1
Repair and Corrective Actions	Repair and Corrective Actions	Mechanical Maintenance	1**	2	1	
		Electrical Maintenance	1**		2	
		Inst Maintenance		1	1	
Protective Actions (In-Plant)	Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue first-aid & firefighting c. Personnel monitoring d. Dosimetry	HP Technicians	2**	1	1	1
Firefighting		Fire Brigade per Tec Specs				5
Rescue Operations and First-Aid			2**	2**	1	1
Site Access Control and Personnel Accountability	Security, firefighting communications, personnel accountability	Security personnel per security plan				
<b>Total On-Shift</b>			<b>10</b>	<b>16</b>	<b>24</b>	<b>25</b>

\*\*May be provided by shift personnel assigned other functions

\*\*\*Overall direction of facility response to be assumed by EOF director when all centers fully manned

\*\*\*\*May be performed by engineering aide to shift supervisor

**SQN Site 30 Minute Augmented ERO Table Comparison**

<b>Major Functional Area</b>	<b>Major Tasks</b>	<b>Position Title / Expertise</b>	<b>Table B-1 Augment</b>	<b>SQN Rev 0 30 min</b>	<b>SQN Rev 105 30 min</b>	<b>SQN Proposed 60 Min</b>
Notification / Communication	Notify State/local and federal personnel, maintain communication		1			4
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Response & Recovery Director	Senior Manager				3
	Offsite Dose Assessment	Sr. HP Expertise	1			3
	Offsite Surveys	HP Technician/driver	2	2	2	2
	On-Site Surveys	HP Technician	1	1	1	1
	In-Plant surveys	HP Technician	1	1	1	
	Chemistry / Radiochemistry	Chem/HP Technician		1		
Plant System Engineering	Technical Support	TAM				1
		TATL				1
		Core/Thermal Hydraulics	1	1		
		Electrical				
		Mechanical				
Repair and Corrective Actions	Repair and Corrective Actions	Mechanical Maintenance				1
		Electrical Maintenance	1	1		1
		I&C Technician	1	1		
		OSC Manager				1
Protective Actions (In-Plant)	Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue first-aid & firefighting c. Personnel monitoring d. Dosimetry	HP Technicians	2	2	2	1
<b>Total Augmented ERO</b>			<b>11</b>	<b>10</b>	<b>6</b>	<b>19</b>

**SQN Site 60 Minute Augmented ERO Table Comparison**

<b>Major Functional Area</b>	<b>Major Tasks</b>	<b>Position Title / Expertise</b>	<b>Table B-1 Augment</b>	<b>SQN Rev 0 60 min</b>	<b>SQN Rev 105 60 min</b>	<b>SQN Proposed 90 Min</b>
Notification / Communication	Notify State/local and federal personnel, maintain communication		2	2	2	1
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Response & Recovery Director	Senior Manager	1	4	4	
	Offsite Dose Assessment	Sr. HP Expertise		2	2	
	Offsite Surveys	HP Technician/driver	2	2	2	2
	On-Site Surveys	HP Technician	1	1	1	1
	In-Plant surveys	HP Technician	1	1	1	
	Chemistry / Radiochemistry	Chem/HP Technician	1	1	1	1
Plant System Engineering	Technical Support	Core/Thermal Hydraulics			1	1
		Electrical	1	1	1	1
		Mechanical	1	1	1	1
Repair and Corrective Actions	Repair and Corrective Actions	Mechanical Maintenance	1	1	1	
		Electrical Maintenance	1	1	1	
		I&C Technician				1
Protective Actions (In-Plant)	Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue first-aid & firefighting c. Personnel monitoring d. Dosimetry	HP Technicians	2	2	2	1
<b>Total Augmented ERO</b>			<b>15</b>	<b>19</b>	<b>20</b>	<b>10</b>

**Attachment 4**

**Off-site Response Organization (ORO) Concurrence Letter**

Patrick Sheehan  
Director

Major General  
Terry Max Haston  
The Adjutant General

August 28, 2017

Mr. Walter H. Lee  
Manager, Emergency Preparedness  
Tennessee Valley Authority  
1101 Market Street, Lookout Place  
Chattanooga, Tennessee 37402-2801

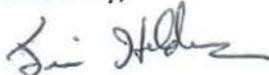
Dear Mr. Lee,

This letter provides written concurrence with the changes TVA is proposing to the Sequoyah Nuclear Plant (SQN) Emergency Response Organization (ERO) as documented in the TVA Radiological Emergency Plan (REP). Based on the information provided by Mr. Parshall of your staff, we understand that the changes eliminate certain positions and extend the response times of other positions. We recognize that the proposed change also extends the time requirements for dispatching sampling teams by 30 minutes. Based on our discussions, we have concluded that through continued coordination between the State and TVA radiological assessment organizations, adequate field monitoring will be maintained.

We do not believe the changes will have an adverse effect on the State/County Emergency Operations Plan. We have identified no changes that will be required to our Plan.

Should there be questions or need for additional information, please do not hesitate to contact me at (615) 741-2128 or Email: [tholden@tnema.org](mailto:tholden@tnema.org).

Sincerely,



Tim Holden  
Technical Hazards Manager  
Tennessee Emergency Management Agency

**Attachment 5**

**Proposed revision to Sequoyah Nuclear Plant, Unit 1, License Condition 2.C.(22)G**

D. Hydrogen Control Measures (Section 22.2, II.B.7)

- (1) Four additional igniter units shall be installed in the containment upper containment compartment in locations acceptable to the NRC staff prior to startup following the second refueling outage.
- (2) Additional tests shall be performed on the Tayco igniter to demonstrate that the igniters will initiate combustion in a spray environment such as that expected in the upper compartment of the ice condenser containment.

E. Auxiliary Feedwater (Section 22.2, II.E.1.1)

Prior to exceeding five percent power, auxiliary feedwater pump endurance tests will be completed and a report shall be submitted to NRC within 30 days after all tests are completed.

F. Radiation Monitors (Section 22.2.II.E.4.2)

TVA will install Radiation Monitors for isolation of fluid lines carrying potential radioactivity outside of containment at the earliest practical date consistent with scheduled or forced plant outages but prior to operation following the first refueling.

G. Emergency Preparedness Plan (Section 22.2.III.A.1.1 And Appendix E)

- (a) TVA shall maintain in effect an emergency plan that meets the regulatory requirement of 10 CFR Part 50, Appendix E, ~~and the operator Planning Objectives of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Preparedness in Support of Nuclear Power Plants," January 1980.~~
- (b) No later than 90 days from the date of issuance of this license, TVA shall report to the NRC the status of any items related to emergency preparedness identified by FEMA or the NRC as requiring further action.

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G. Emergency Preparedness Plan (Section 22.2.III.A.1.1 And Appendix E)

- (a) TVA shall maintain in effect an emergency plan that meets the regulatory requirement of 10 CFR Part 50, Appendix E.
- (b) No later than 90 days from the date of issuance of this license, TVA shall report to the NRC the status of any items related to emergency preparedness identified by FEMA or the NRC as requiring further action.